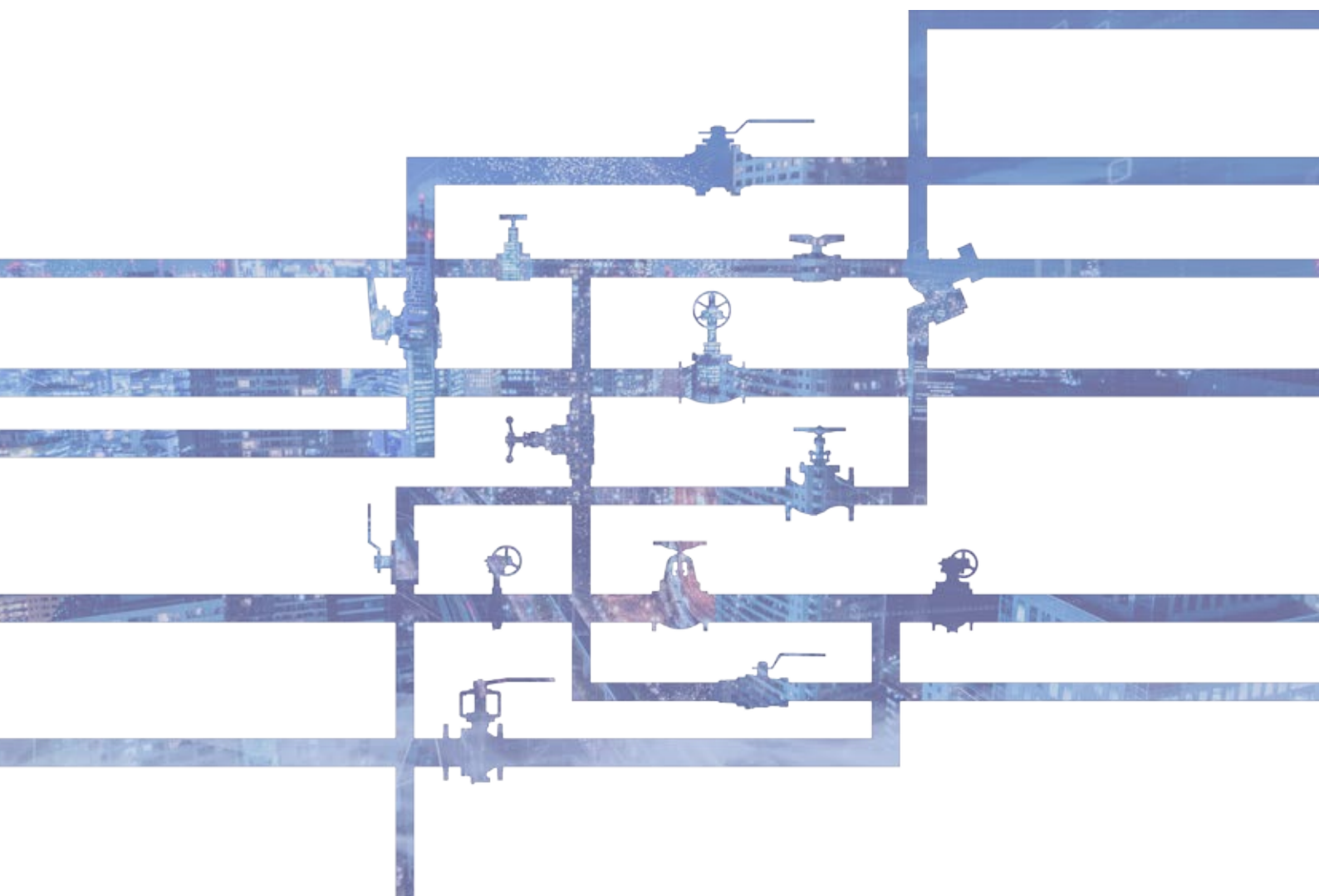




GENERAL CATALOG

Ductile Iron



INDEX

DI
Ductile Iron

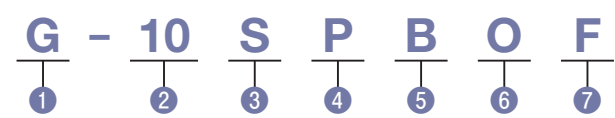
Title	Body Material	Type	Class	End Connection*	Features*	Fig	Remarks	Page		
Ductile Iron Valves	DI	Globe	10K Commercial	TE	SB up to 2" or UB, IS, RS	10SJ		DI3 82		
			FE/FF	10SJBF						
			10K	TE	UB, IS, RS	10SP				
						FE/FF			10SPBFB	
									10SPBAF	
				BB, OS&Y, RS	10SPBAWF	Bellows Seal				
					(G-)10SPBOF					
				16K	TE	US, IS, RS	10SPBOWF		Bellows Seal	
			10SPNBF				Needle			
			20K	FE/RF	BB, OS&Y, RS	16SP				
						16SPB				
				TE	UB, IS, RS	(G-)16SPBO				
						20SY				
			150	FE/RF	BB, OS&Y, RS	20SYB	Bellows Seal			
						20SYBO				
			300	FE/RF	BB, OS&Y, RS	20SYBOW				
						150SPB				
			10K Commercial	TE	SB up to 2" or UB, IS, RS	150SPBO				
						FE/FF	300SYB			
			20K	FE/RF	BB, OS&Y, RS	300SYBO				
			10K Commercial	TE	SB up to 2" or UB, IS, RS	10SD	Soft Seated (PTFE)			
						FE/FF			10SDBF	
			20K	FE/RF	BB, OS&Y, RS	20SDBOW	Bellows Seal, Soft Seated (PTFE)			
			10K Commercial	TE	SB, IS, RS	10SDL	Soft Seated (PTFE), LPG Service			
						FE/FF			10SDLBF	
			20K	FE/RF	UB, IS, RS	20SDL				
						FE/RF			20SDLB	
			10K	FE/FF	BB, OS&Y, RS	20SDLBO				
						10SPD	Soft Seated (PTFE)			
			150	FE/RF	UB, IS, RS	10SPDBF	Bellows Seal, Soft Seated (PTFE)			
						10SPDBOF				
			10K	FE/FF	BB, OS&Y, RS	10SPDBOWF				
						150SPDB	Soft Seated (PTFE)			
			20K	FE/RF	BB, OS&Y, RS	10SYYBF	Y Pattern Globe			
						10SYYBOF				
			150	FE/RF	UB, IS, RS	20SYYB				
						20SYYBO				
			10K	FE/FF	BB, OS&Y, RS	20SYYB				
						20SYYBO				
			10K Commercial	TE	SB, IS, RS	10SMS				
						FE/FF			10SMAS	
			10K	FE/FF	BB, IS, RS	10SMBF				
						FE/FF			10SMBOF	
			16K	FE/RF	BB, OS&Y, RS	16SMS				
						FE/RF			16SMB	
			20K	FE/RF	BB, OS&Y, RS	16SMBO				
		FE/RF				20SLS				
		150	FE/RF	BB, IS, RS	20SLB					
					FE/RF			20SLBO		
		300	FE/RF	BB, OS&Y, RS	150SMBO					
					FE/RF			300SLBO		
		Check	10K Commercial	TE	SC, Lift	10SF				
						FE/FF			10SFBF	
			16K	TE		16SF				
						FE/RF			16SFB	
			10K Commercial	TE	UC, Lift	10SN				
						FE/FF			10SNBF	
			20K	FE/RF		20SN				
						FE/RF			20SNB	
			10K Commercial	TE	Split Body, Swing	10SOZ	Internal Hinge, In line			
						FE/FF			10SRBF	
			16K	FE/RF	BC, Swing	16SRB				
						FE/RF			20SOB	
			150			150SRB				
						300SOB				
			10K	Wafer	Dual Plate, Built-in by-pass valve, Wafer	10SWZU	Available to install low & high torque spring depending on fluid conditions.			
						20SWZ				
			20K	FE/FF	UB, IS, RS, Stop Check	20SWZU				
						FE/FF			10SYFBF	
			10K	FE/FF	BB, OS&Y, RS, Stop Check	10SPFBOF				
						FE/FF			20SYFB	
			20K	FE/RF	UB, IS, RS, Stop Check	20SYFBO				
						FE/RF			20SND	
			10K Commercial	TE	SC up to 2" or BC	20SODB	Soft Seated (PTFE), LPG Service			
						FE/FF			20SODB	
			10K	FE/FF	SC up to 11/2" or BC	10FDY	Y Pattern, Screen: Punched Stainless Steel Plate			
						FE/FF			10FDYBF	
			16K	FE/RF	SC up to 11/2" or BC	16FDY				
						FE/RF			16FDYB	
			20K	FE/RF	BC	20FDY	Y Pattern, Screen: 40 mesh wire cloth			
		FE/RF				20FDYB				
		Ball	Type 400	TE	RB, Split Body	STZ				
						20ST				
			20K	FE/FF	RB, Split Body, Side Entry	20STL	Gas Service			
						FE/FF			10STBF	
10K	FE/FF		FB, Split Body, Side Entry	10STLBF	Gas Service					
				FE/FF			(G-)20STB			
20K	FE/RF		FB, Split Body, Side Entry	20STLB	Gas Service					
				FE/RF			20STLB			
10K	FE/FF		FB, 3-Way 4-Seat	10STB4LAF/TAF						
				FE/FF			10STR4LAF/TAF			

* (Abbreviation) TE: Threaded Ends, FE: Flanged Ends, RF: Raised Face Ends
SB: Screwed Bonnet, UB: Union bonnet, IS: Inside screw, RS: Rising Stem, FB: Full Bore, RB: Reduced Bore

PRODUCT CODING

Ductile Iron Valves

(Note: Some products do not follow this coding system.)



1 Valve Operation

- None Handwheel or Lever
- G Gear

2 Pressure Class

- 10 10K
- 16 16K
- 20 20K
- 150 Class 150*
- 300 Class 300*

3 Symbol of Shell Material

- S Ductile Iron
- FD Ductile Iron (Strainer)

4 Valve Type

- M or L Gate
- MS or LS Gate (Disc: 13Cr)
- J, P or Y Globe
- PD or D Soft Seated Globe
- DL Soft Seated Globe (LP Service)
- PN Needle
- YY Y Pattern Globe
- F or N Lift Check
- ND Soft Seated Lift Check
- R or O Swing Check
- OD Soft Seated Swing Check
- OZ In Line Swing Check
- WZ Wafer Check (Copper Disc)
- WZU Wafer Check (304SS Disc)
- YF Stop Check
- Y Strainer (Note: FD of 3)
- T Ball Valve (Threaded)
- TB Ball Valve (Flanged)

5 End Connection

- None Threaded Ends
- S Threaded Ends
- B Flanged Ends

6 Valve Construction

- None Inside Screw
- A BB, IS
- O BB, OS&Y
- W Bellows Seal

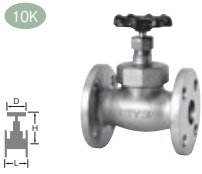
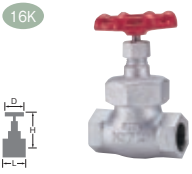
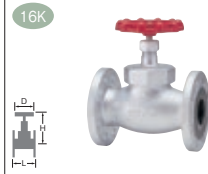
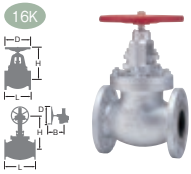
7 Surface of End Flange

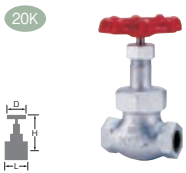
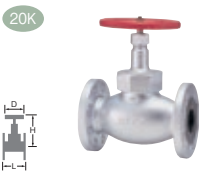
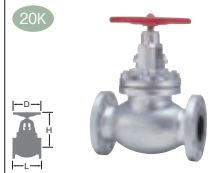
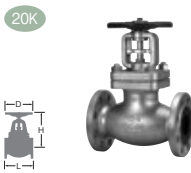
- None Raised Face*
- F Flat Face

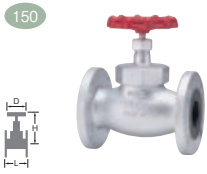
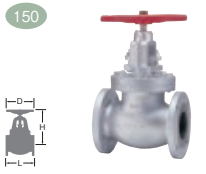
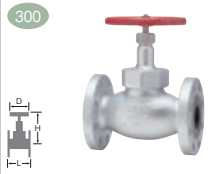
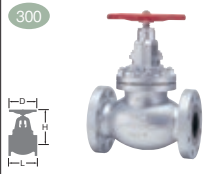
* Pipe connection dimensions shall be indicated in millimeters converted from dimensions in inches according to ASME B16.5.

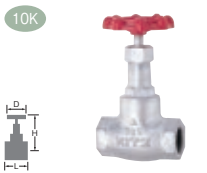
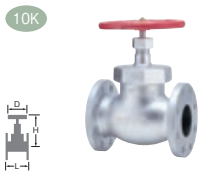
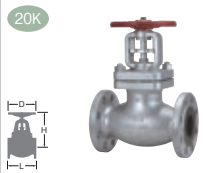
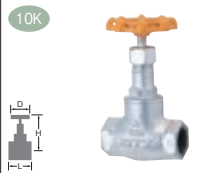
Type	Globe					Globe					Globe					Globe				
Ductile Iron	   					   					   					   				
Fig	10SJ					10SJBF					10SP					10SPBF				
End Connection	BS21 (JIS B0203)					JIS B2239 10K FF					BS21 (JIS B0203)					JIS B2239 10K FF				
inch	mm	L	H	D		L	H	D			L	H	D			L	H	D		
1/4	8	50	108	60																
3/8	10	55	108	60		85	108	60			64	107	60			108	107	60		
1/2	15	65	122	70		85	123	70			70	125	80			108	124	80		
3/4	20	80	124	80		95	125	80			80	125	80			117	125	80		
1	25	90	146	90		110	147	90			90	145	100			127	147	100		
1 1/4	32	105	161	100		130	161	100			110	162	115			140	162	115		
1 1/2	40	120	181	115		150	181	115			120	180	115			165	180	115		
2	50	140	198	135		180	198	135			140	198	135			203	198	135		
2 1/2	65	180	256	180		210	256	180												
3	80	200	286	225		240	276	225												
Body/Bonnet	FCD-S					FCD-S					FCD-S					FCD-S				
Stem	420J2					420J2					420J2					420J2				
Disc	403SS					403SS					403SS					403SS				
Gland Packing	T/#2200K					T/#2200K					P/#6118					P/#6118				
Gasket	None or P/#6633					None or P/#6633					C1100P-0 (incl. Cu)					C1100P-0 (incl. Cu)				
Seat Rings (S/D)	403SS/-					403SS/-					403SS/-					403SS/-				
Service Conditions	120°C Static Water 1.4MPa, 220°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 220°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa				
Remarks	SB up to 2 ^B , UB 2 1/2 ^B & over					SB up to 2 ^B , UB 2 1/2 ^B & over														

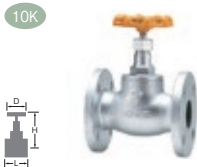
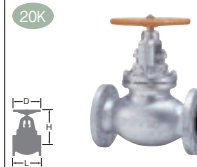
Type	Globe					Bellows Seal Globe					Globe					Bellows Seal Globe				
Ductile Iron	   					   					   					   				
Fig	10SPBAF					10SPBAWF					10SPBOF/G-10SPBOF*					10SPBOWF				
End Connection	JIS B2239 10K FF					JIS B2239 10K FF					JIS B2239 10K FF					JIS B2239 10K FF				
inch	mm	L	H	D		L	H	D			L	H	D	B		L	H	D		
1/2	15	108	123.5	80		108	166	80												
3/4	20	117	124	80		117	167	80												
1	25	127	146	100		127	188	80												
1 1/4	32	140	161.5	115		140	243	100												
1 1/2	40	165	179	115		165	243	100												
2	50	203	197.5	135							203	308	200			203	298	200		
2 1/2	65										216	311	225			216	302	225		
3	80										241	352	250			241	343	250		
4	100										292	371	250			292	354	250		
5	125										356	459	300			356	443	300		
6	150										406	526	350			406	502	350		
8	200										495	589	400			495	749	450		
10	250										622	879	360	245						
12	300										698	943	360	245						
Body/Bonnet	FCD-S					FCD-S					FCD-S					FCD-S				
Stem	420J2					420J2					403SS					403SS				
Disc/Bellows	403SS					403SS/316LSS					FCD-S or 403SS					304SS+HF/316LSS				
Gland Packing	P/#6118					P/#6118					P/#6118					P/#6527				
Gasket	P/#6633					P/#6633					P/#6633					P/#6633				
Seat Rings (S/D)	403SS/-					403SS/-					403SS/403SS					304SS+HF or 403SS+HF				
Service Conditions	120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa				
Reference Page						Features: Page DI17										Features: Page DI17				
Remarks											*Gear: 10 ^B & over					HF: Hard Face with Co-Cr-W Alloy				

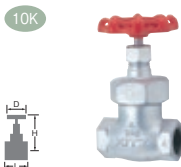
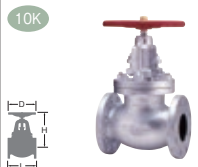
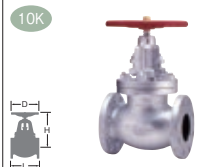
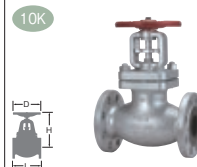
Type	Needle				Globe				Globe				Globe			
Ductile Iron	 				 				 				 			
Fig	10SPNBF				16SP				16SPB				16SPBO/G-16SPBO*			
End Connection	JIS B2239 10K FF				BS21 (JIS B0203)				JIS B2239 16K RF				JIS B2239 16K RF			
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D	B		
3/8	10	108	109	60	64	108	60	108	111	60						
1/2	15	108	125	80	70	124	80	108	122	80						
3/4	20	117	125	80	85	125	80	117	128	80						
1	25	127	148	100	95	147	100	127	146	100						
1 1/4	32	0	0	0	110	162	115	140	165	115						
1 1/2	40	165	181	115	125	180	115	165	182	115						
2	50	203	199	135	145	198	135	203	198	135	203	308	200			
2 1/2	65										216	311	225			
3	80										241	352	250			
4	100										292	371	250			
5	125										356	459	300			
6	150										406	526	350			
8	200										495	589	400			
10	250										622	880	360	244		
12	300										698	943	360	244		
Body/Bonnet	FCD-S				FCD-S				FCD-S				FCD-S			
Stem	420J2				420J2				420J2				403SS			
Disc/Bellows	403SS				403SS				403SS				FCD-S or 403SS			
Gland Packing	P/#6118				T/#2230K				T/#2230K				P/#6118			
Gasket	P/#6633				C1100P-0 (incl. Cu)				C1100P-0 (incl. Cu)				P/#6633			
Seat Rings (S/D)	403SS/-				403SS/-				403SS/-				403SS/403SS			
Service Conditions	120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa				120°C Static Water 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa				120°C Static Water 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa				120°C Static Water 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa			
Reference Page	Features: Page DI17															
Remarks													*Gear: 10 ^B & over			

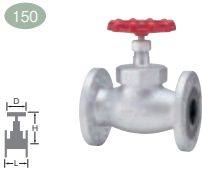
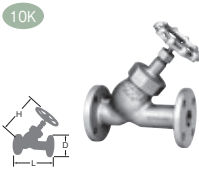
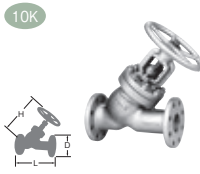
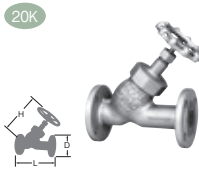
Type	Globe				Globe				Globe				Bellows Seal Globe			
Ductile Iron	 				 				 				 			
Fig	20SY				20SYB				20SYBO				20SYBOW			
End Connection	BS21 (JIS B0203)				JIS B2239 20K RF				JIS B2239 20K RF				JIS B2239 20K RF			
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D			
3/8	10	75	136	70	110	136	70									
1/2	15	78	138	80	110	138	80				110	184	90			
3/4	20	91	157	100	120	157	100				120	184	90			
1	25	105	180	115	130	178	115				130	190	100			
1 1/4	32	122	205	135	160	202	135				160	238	140			
1 1/2	40	135	210	135	180	210	135				180	238	140			
2	50	160	240	180	230	239	180	267	296	225	230	271	160			
2 1/2	65							292	343	250	292	285	180			
3	80							318	374	250	318	395	250			
4	100							356	452	300	356	432	300			
5	125							400	536	350	400	529	350			
6	150							444	601	400	444	586	400			
8	200							559	701	560	559	749	450			
Body/Bonnet	FCD-S				FCD-S				FCD-S				FCD-S			
Stem	420J2				420J2				403SS				403SS			
Disc/Bellows	403SS+HF				403SS+HF				A105+HF				304SS+HF/316LSS			
Gland Packing	P/#6118				P/#6118				P/#6118				P/#6527			
Gasket	C1100P-0 (incl. Cu)				C1100P-0 (incl. Cu)				P/#6633				P/#6633			
Seat Rings (S/D)	304SS+HF/-				304SS+HF/-				A105+HF or 403SS+HF/-				304SS+HF or 403SS+HF/-			
Service Conditions	120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa				120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa				120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa				120°C Static Water 2.8MPa, 350°C Steam, Air, Gas, Oil 2.0MPa			
Reference Page													Features: Page DI17			
Remarks	HF: Hard Face with Co-Cr-W Alloy				HF: Hard Face with Co-Cr-W Alloy				HF: Hard Face with Co-Cr-W Alloy				HF: Hard Face with Co-Cr-W Alloy			

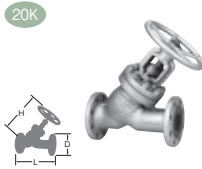
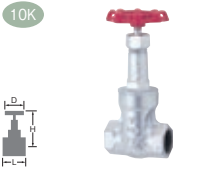
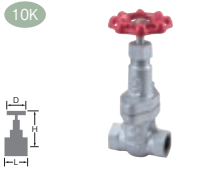
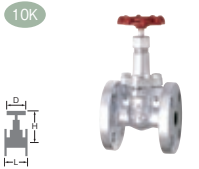
Type	Globe					Globe					Globe					Globe				
Ductile Iron																				
Fig	150SPB					150SPBO					300SYB					300SYBO				
End Connection	ASME B16.5 CL150 RF					ASME B16.5 CL150 RF					ASME B16.5 CL300 RF					ASME B16.5 CL300 RF				
inch	mm	L	H	D		L	H	D			L	H	D			L	H	D		
1/2	15	108	122	80							110	138	80							
3/4	20	117	128	80							120	157	100							
1	25	127	146	100							130	178	115							
1 1/4	32	140	165	115							160	202	135							
1 1/2	40	165	179	115							180	210	135							
2	50	203	198	135		203	308	200			230	239	180			267	296	225		
2 1/2	65					216	311	225								292	341	250		
3	80					241	352	250								318	372	250		
4	100					292	371	250								356	450	300		
5	125					356	459	300								400	535	350		
6	150					406	526	350								444	601	400		
8	200					495	588	400								559	701	560		
Body/Bonnet	FCD-S					FCD-S					FCD-S					FCD-S				
Stem	420J2					403SS					420J2					403SS				
Disc/Bellows	403SS					FCD-S or 403SS					403SS+HF					A105+HF				
Gland Packing	P/#6118					P/#6118					P/#6118					P/#6118				
Gasket	C1100P-0 (incl. Cu)					P/#6633					C1100P-0 (incl. Cu)					P/#6633				
Seat Rings (S/D)	403SS/-					403SS/403SS					304SS+HF/-					A105+HF or 403SS+HF/-				
Service Conditions	-5~38°C W.O.G. 1.73MPa, 149°C W.O.G. 1.48MPa, 260°C W.O.G. 1.18MPa, 343°C W.O.G. 0.86MPa					-5~38°C W.O.G. 1.73MPa, 149°C W.O.G. 1.48MPa, 260°C W.O.G. 1.18MPa, 343°C W.O.G. 0.86MPa					-5~38°C W.O.G. 2.94MPa, 149°C W.O.G. 2.60MPa, 260°C W.O.G. 2.28MPa, 350°C W.O.G. 2.04MPa					-5~38°C W.O.G. 2.94MPa, 149°C W.O.G. 2.60MPa, 260°C W.O.G. 2.28MPa, 350°C W.O.G. 2.04MPa				
Remarks	F-to-F: ASME B16.10					F-to-F: ASME B16.10					F-to-F: ASME B16.10 HF: Hard Face with Co-Cr-W Alloy					F-to-F: ASME B16.10 HF: Hard Face with Co-Cr-W Alloy				

Type	Globe					Globe					Bellows Seal Globe					Globe				
Ductile Iron																				
Fig	10SD					10SDBF					20SDBOW					10SDL				
End Connection	BS21 (JIS B0203)					JIS B2239 10K FF					JIS B2239 20K RF					BS21 (JIS B0203)				
inch	mm	L	H	D		L	H	D			L	H	D			L	H	D		
1/4	8	50	108	60																
3/8	10	55	108	60		85	108	60								55	112	55		
1/2	15	65	123	70		85	122	70			110	184	90			65	122	60		
3/4	20	80	123	80		95	124	80			120	184	90			80	130	70		
1	25	90	144	90		110	146	90			130	190	100			90	149	80		
1 1/4	32	105	159	100		130	161	100			160	238	140			105	169	90		
1 1/2	40	120	178	115		150	181	115			180	238	140			120	187	100		
2	50	140	197	135		180	198	135			230	271	160			140	205	115		
2 1/2	65	180	262	180		210	268	180			292	285	180							
3	80	200	295	225		240	290	225			318	395	250							
4	100										356	432	300							
5	125										400	529	350							
6	150										444	586	400							
8	200										559	749	450							
Body/Bonnet	FCD-S					FCD-S					FCD-S					FCD-S				
Stem	420J2					420J2					403SS					420J2				
Disc	G/F PTFE					G/F PTFE					G/F PTFE					G/F PTFE				
Gland Packing	T/#2200K					T/#2200K					P/#6527					NBR (V/#2631)				
Gasket	C1100P-0 (incl. Cu)/P/#6633					C1100P-0 (incl. Cu)/P/#6633					P/#6633					C1100P-0 (incl. Cu)				
Seat Rings (S/D)	403SS/-					403SS/-					304SS or 403SS/-					403SS/-				
Service Conditions	120°C Static Water 1.4MPa, 180°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 180°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 2.5MPa, 180°C Steam, Air, Gas, Oil 2.0MPa					LPG at Room Temperature 0.20MPa				
Reference Page											Features: Page DI17									
Remarks	SB up to 2 ³ , UB 21/2 ^B & over										HF: Hard Face with Co-Cr-W Alloy					LPG Service				

Type	Globe					Globe					Globe					Globe				
Ductile Iron																				
																				
Fig	10SDLBF					20SDL					20SDLB					20SDLBO				
End Connection	JIS B2239 10K FF					BS21 (JIS B0203)					JIS B2239 20K RF					JIS B2239 20K RF				
inch	mm	L	H	D		L	H	D			L	H	D			L	H	D		
3/8	10	85	108	55		75	129	70			110	128	70							
1/2	15	85	122	60		78	129	70			110	128	70							
3/4	20	95	122	70		91	147	90			120	147	90							
1	25	110	145	80		105	168	100			130	168	100							
1 1/4	32	130	160	90		122	193	115			160	192	115							
1 1/2	40	150	179	100		135	200	135			180	201	135							
2	50	180	198	115		160	235	155			230	237	155							
2 1/2	65															292	337	250		
3	80															318	351	250		
4	100															356	439	300		
6	150															444	600	400		
8	200															559	688	560		
Body/Bonnet	FCD-S					FCD-S					FCD-S					FCD-S				
Stem	420J2					420J2					420J2					403SS				
Disc	G/F PTFE					PTFE					PTFE					PTFE				
Gland Packing	NBR (V/#2631)					NBR					NBR					NBR				
Gasket	C1100P-0 (incl. Cu)					P/#6633					P/#6633					P/#6633				
Seat Rings (S/D)	403SS/-					304SS/-					304SS/-					403SS/-				
Service Conditions	LPG at Room Temperature 0.20MPa					80°C gas 2.4MPa					80°C gas 2.4MPa					80°C gas 2.4MPa				
Remarks	LPG Service					LPG Service					LPG Service					LPG Service				

Type	Globe					Globe					Globe					Bellows Seal Globe				
Ductile Iron																				
																				
Fig	10SPD					10SPDBF					10SPDBOF					10SPDBOWF				
End Connection	BS21 (JIS B0203)					JIS B2239 10K FF					JIS B2239 10K FF					JIS B2239 10K FF				
inch	mm	L	H	D		L	H	D			L	H	D			L	H	D		
1/2	15	70	125	80		108	125	80								108	184	90		
3/4	20	80	125	80		117	125	80								117	184	90		
1	25	90	146	100		127	145	100								127	190	100		
1 1/4	32	110	162	115		140	162	115								140	238	140		
1 1/2	40	120	180	115		165	180	115								165	238	140		
2	50	140	198	135		203	198	135			203	308	200			203	271	160		
2 1/2	65										216	311	225			216	305	180		
3	80										241	352	250			241	395	250		
4	100										292	371	250			292	432	300		
5	125										356	459	300			356	529	350		
6	150										406	518	350			406	586	400		
8	200										495	581	400			495	749	450		
Body/Bonnet	FCD-S					FCD-S					FCD-S					FCD-S				
Stem	420J2					420J2					403SS					403SS				
Disc/Bellows	G/F PTFE					G/F PTFE					G/F PTFE					G/F PTFE/316LSS				
Gland Packing	P/#6118					P/#6118					P/#6118					P/#6527				
Gasket	C1100P-0 (incl. Cu)					C1100P-0 (incl. Cu)					P/#6633					P/#6633				
Seat Rings (S/D)	403SS/-					403SS/-					403SS/-					304SS or 403SS/-				
Service Conditions	120°C Static Water 1.4MPa, 180°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 180°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 180°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 180°C Steam, Air, Gas, Oil 1.0MPa				
Reference Page																Features: Page D117				

Type	Globe					Y Globe			Y Globe			Y Globe		
Ductile Iron	   					   			   			   		
Fig	150SPDB					10SYYBF			10SYYBOF			20SYYB		
End Connection	ASME B16.5 CL150 RF					JIS B2239 10K FF			JIS B2239 10K FF			JIS B2239 20K RF		
inch	mm	L	H	D		L	H	D	L	H	D	L	H	D
1/2	15	108	127	70										
3/4	20	117	135	70										
1	25	127	155	90	180	191.5	115					180	191.5	115
1 1/4	32	140	172	100										
1 1/2	40	165	193	115	240	311	135					240	311	135
2	50	203	208	135					280	311	225			
2 1/2	65								315	357.5	250			
3	80								350	392	250			
Body/Bonnet	FCD-S					FCD-S			FCD-S			FCD-S		
Stem	420J2					420J2			403SS			420J2		
Disc/Bellows	G/F PTFE					403SS+HF			A105+HF			403SS+HF		
Gland Packing	P/#6118					P/#6118			P/#6118			P/#6118		
Gasket	C1100P-0 (incl. Cu)					P/#6633			P/#6633			P/#6633		
Seat Rings (S/D)	403SS/-					304SS+HF/-			403SS+HF/-			304SS+HF/-		
Service Conditions	-5~38°C W.O.G. 1.73MPa, 149°C W.O.G. 1.48MPa, 180°C W.O.G. 1.18MPa					120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa			120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa			120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa		
Remarks						HF: Hard Face with Co-Cr-W Alloy			HF: Hard Face with Co-Cr-W Alloy			HF: Hard Face with Co-Cr-W Alloy		

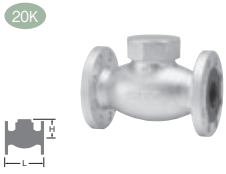
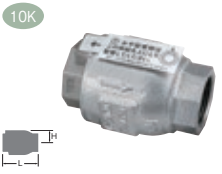
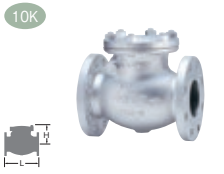
Type	Y Globe					Gate			Gate			Gate		
Ductile Iron	   					   			   			   		
Fig	20SYYBO					10SMS			10SMAS			10SMBF		
End Connection	JIS B2239 20K RF					BS21 (JIS B0203)			BS21 (JIS B0203)			JIS B2239 10K FF		
inch	mm	L	H	D		L	H	D	L	H	D	L	H	D
1/2	15					60	150	60	65	161	70	90	161	70
3/4	20					70	170	70	75	162	70	100	162	70
1	25					75	197	80	80	184.5	80	110	185	80
1 1/4	32					85	232	90	90	215	90	120	216	90
1 1/2	40					95	274	100	100	250	110	130	251	100
2	50	280	311	225		105	316	115	110	285	115	140	285	115
2 1/2	65	315	357.5	250										
3	80	350	392	250										
Body/Bonnet	FCD-S					FCD-S			FCD-S			FCD-S		
Stem	403SS					420J2			420J2			420J2		
Disc/Bellows	A105+HF					SCS1			SCS1			SCS1		
Gland Packing	P/#6118					T/#2200K			P/#6118			P/#6118		
Gasket	P/#6633								P/#6633			P/#6633		
Seat Rings (S/D)	403SS+HF/-					403SS/-			403SS/-			403SS/-		
Service Conditions	120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa					120°C Static Water 1.4MPa, 220°C Steam, Air, Gas, Oil 1.0MPa			120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa			120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa		
Remarks	HF: Hard Face with Co-Cr-W Alloy													

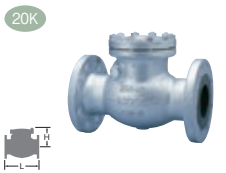
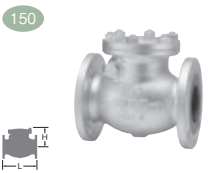
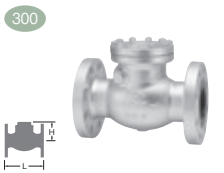
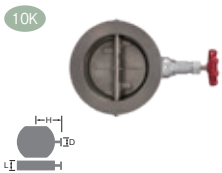
Type	Gate				Gate				Gate				Gate			
Ductile Iron																
Fig	10SMBOF				16SMS				16SMB				16SMBO			
End Connection	JIS B2239 10K FF				BS21 (JIS B0203)				JIS B2239 16K RF				JIS B2239 16K RF			
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D			
1/2	15				65	163	70	108	163	70						
3/4	20				75	182	80	117	164	70						
1	25				80	212	90	127	187	80						
1 1/4	32				90	245	100	140	219	90						
1 1/2	40	165	301	160	100	285	115	165	253	100	165	301	160			
2	50	178	352	200	110	330	135	178	285	115	178	352	200			
2 1/2	65	190	410	200							190	410	200			
3	80	203	479	250							203	479	250			
4	100	229	566	250							229	566	250			
5	125	254	668	300							254	668	300			
6	150	267	780	300							267	780	300			
8	200	292	970	350							292	970	350			
10	250	330	1181	400							330	1181	400			
12	300	356	1404	450							356	1404	450			
14	350	381	1538	500												
16	400	406	1702	600												
18	450	432	1538	500												
20	500	457	1702	600												
Body/Bonnet	FCD-S				FCD-S				FCD-S				FCD-S			
Stem	403SS or F6a Cl.2				420J2				420J2				403SS			
Disc	SCS1 or 403SS or CS+13Cr				SCS1				SCS1				SCS1 or 403SS or CS+13Cr			
Gland Packing	P/#6118				T/#2230K				T/#2230K				P/#6118			
Gasket	P/#6633				C1100P-0 (incl. Cu)				C1100P-0 (incl. Cu)				P/#6633			
Seat Rings (S/D)	403SS				403SS				403SS				403SS			
Service Conditions	120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa				120°C Static Water 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa				120°C Static Water 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa				120°C Static Water 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa			

Type	Gate				Gate				Gate				Gate			
Ductile Iron																
Fig	20SLS				20SLB				20SLBO				150SMBO			
End Connection	BS21 (JIS B0203)				JIS B2239 20K RF				JIS B2239 20K RF				ASME B16.5 CL150 RF			
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D			
1/2	15	70	175	90	108	176	90									
3/4	20	75	177	90	117	177	90									
1	25	85	214	100	127	214	100									
1 1/4	32	95	241	115	140	242	115									
1 1/2	40	105	277	135	165	277	135	190	326	160	165	301	160			
2	50	115	301	135				216	402	200	178	352	200			
2 1/2	65							241	456	200	190	410	200			
3	80							283	518	250	203	479	250			
4	100							305	599	250	229	566	250			
5	125							381	725	300	254	668	300			
6	150							403	847	350	267	780	300			
8	200							419	1076	400	292	970	350			
10	250							457	1239	450	330	1181	400			
12	300							502	1448	500	356	1404	450			
Body/Bonnet	FCD-S				FCD-S				FCD-S				FCD-S			
Stem	420J2				420J2				403SS/-				403SS			
Disc/Bellows	SCS1				SCS1				SCS1 or 403SS or CS+13Cr				SCS1 or 403SS or CS+13Cr			
Gland Packing	P/#6118				P/#6118				P/#6118				P/#6118			
Gasket	P/#6633				P/#6633				P/#6633				P/#6633			
Seat Rings (S/D)	403SS/-				403SS/-				403SS/-				403SS/-			
Service Conditions	120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa				120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa				120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa				-5~38°C W.O.G. 1.73MPa, 149°C W.O.G. 1.48MPa, 260°C W.O.G. 1.18MPa, 343°C W.O.G. 0.86MPa			

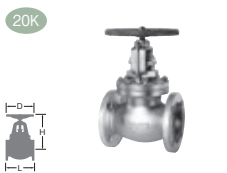
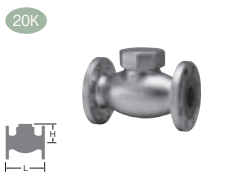
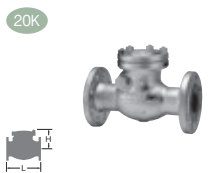
Type	Gate				Lift Check			Lift Check			Lift Check		
Ductile Iron	300  BB OS&Y RS				10K  SC			10K  SC			16K  UC		
													
Fig	300SLBO				10SF			10SFBF			16SF		
End Connection	ASME B16.5 CL300 RF				BS21 (JIS B0203)			JIS B2239 10K FF			BS21 (JIS B0203)		
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D
1/2	15				65	39		85	39		70	50	
3/4	20				80	42		95	42		85	53	
1	25				90	48		110	49		95	61	
1 1/4	32				105	56		130	56		110	69	
1 1/2	40				120	65		150	65		125	75	
2	50	216	407	200	140	73		180	74		145	87	
2 1/2	65	241	462	200									
3	80	283	522	250									
4	100	305	599	250									
5	125	381	725	300									
6	150	403	847	350									
8	200	419	1076	400									
10	250	457	1240	450									
12	300	502	1448	500									
Body/Bonnet	FCD-S				FCD-S/SCS1			FCD-S/SCS1			FCD-S/304SS		
Stem	403SS/-												
Disc/Bellows	403SS or CS+13Cr				SCS1			SCS1			SCS1		
Gland Packing	P/#6118												
Gasket	P/#6633										C1100P-0 (incl. Cu)		
Seat Rings (S/D)	403SS/-				403SS/-			403SS/-			403SS/-		
Service Conditions	-5~38°C W.O.G. 2.94MPa, 149°C W.O.G. 2.60MPa, 260°C W.O.G. 2.28MPa, 350°C W.O.G. 2.04MPa				120°C Static Water 1.4MPa, 220°C Steam, Air, Gas, Oil 1.0MPa			120°C Static Water 1.4MPa, 220°C Steam, Air, Gas, Oil 1.0MPa			120°C Static Water 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa		

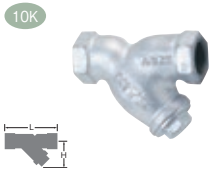
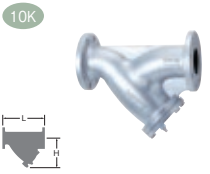
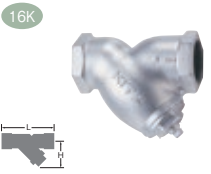
Type	Lift Check				Lift Check				Lift Check				Lift Check			
Ductile Iron	16K  				10K  				10K  				20K  			
	16SFB				10SN				10SNBF				20SN			
	JIS B2239 16K RF				BS21 (JIS B0203)				JIS B2239 10K FF				BS21 (JIS B0203)			
	inch	mm	L	H	D	L	H	D	L	H	D	L	H	D		
	1/2	15	108	50		70	48		108	49		78	56			
3/4	20	117	53		80	51		117	52		91	60				
1	25	127	61		90	60		127	60		105	68				
1 1/4	32	140	69		110	67		140	68		122	80				
1 1/2	40	165	75		120	73		165	74		135	85				
2	50	203	87		140	85		203	86		160	99				
Body/Bonnet	FCD-S/304SS				FCD-S/304SS				FCD-S/304SS				FCD-S/SCS1			
Disc/Bellows	SCS1				SCS1				SCS1				SCS13A+HF			
Gasket	C1100P-0 (incl. Cu)				C1100P-0 (incl. Cu)				C1100P-0 (incl. Cu)				P/#6633			
Seat Rings (S/D)	403SS/-				403SS/-				403SS/-				SCS13A+HF/-			
Service Conditions	120°C Static Water 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa				120°C Static Water 1.4MPa, 220°C Steam, Air, Gas, Oil 1.2MPa				120°C Static Water 1.4MPa, 220°C Steam, Air, Gas, Oil 1.2MPa				120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa			
Remarks													HF: Hard Face with Co-Cr-W Alloy			

Type	Lift Check				Swing Check			Swing Check			Swing Check		
Ductile Iron													
Fig	20SNB				10SOZ			10SRBF			16SRB		
End Connection	JIS B2239 20K RF				BS21 (JIS B0203)			JIS B2239 10K FF			JIS B2239 16K RF		
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D
1/2	15	110	56		65	21.5							
3/4	20	120	60		80	24.5							
1	25	130	68		90	29							
1 1/4	32	160	80		105	35							
1 1/2	40	180	85		120	41.5		165	118				
2	50	230	99		140	48.5		203	123		203	125	
2 1/2	65							216	133		216	136	
3	80							241	154		241	153	
4	100							292	168		292	171	
5	125							330	196		330	201	
6	150							356	214		356	219	
8	200							495	256		495	264	
10	250							622	311		622	320	
12	300							698	351		698	359	
Body/Bonnet	FCD-S/SCS1				FCD-S/SCS13A			FCD-S			FCD-S		
Stem					304SS(SCS13A)			403SS/-			403SS/-		
Disc/Bellows	SCS13A+HF				304SS or SCS13A			403SS or SCPH2+13Cr			403SS or SCPH2+13Cr		
Gasket	P/#6633							P/#6633			P/#6633		
Seat Rings (S/D)	SCS13A+HF/-							403SS/-			403SS/-		
Service Conditions	120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa				120°C Static Water 1.4MPa, 220°C Steam, Air, Gas, Oil 1.0MPa			120°C Static Water 1.4MPa, 300°C Steam, Air, Gas, Oil 1.0MPa			120°C Static Water 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa		
Reference Page					Features: Page DI16								
Remarks	HF: Hard Face with Co-Cr-W Alloy				Internal Hinge Pin								

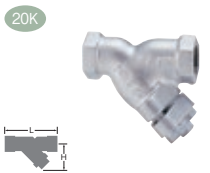
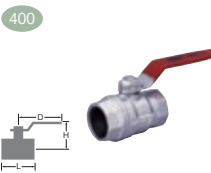
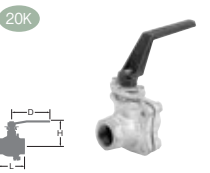
Type	Swing Check				Swing Check			Swing Check			Wafer Check		
Ductile Iron													
Fig	20SOB				150SRB			300SOB			10SWZU		
End Connection	JIS B2239 20K RF				ASME B16.5 CL150 RF			ASME B16.5 CL300 RF			Wafer (JIS 10K)		
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D
1 1/2	40				165	115							
2	50	267	133		203	125		267	133		56	162	70
2 1/2	65	292	143		216	136		292	143		56	168	70
3	80	318	158		241	153		318	158		59	175	70
4	100	356	186		292	171		356	186		66	187	70
5	125	400	218		330	206		400	218		72	201	70
6	150	444	238		356	224		444	238		78	221	80
8	200	533	278		495	264		533	278		96	248	80
10	250	622	335		622	325		622	335		109	299	90
12	300	711	370		698	364		711	370		145	328	90
14	350										184	337	90
16	400										191	367	90
18	450										204	395	90
Body/Cover/Cap	FCD-S				FCD-S			FCD-S			FCD-S+NBR		
Hinge Pin/Spring	403SS/-				403SS/-			403SS/-			304SS		
Disc	403SS or SCPH2+13Cr				403SS or SCPH2+13Cr			403SS or SCPH2+13Cr			CF8 or 403SS		
Gland Packing					T/#2200K								
Gasket	P/#6633				P/#6633			P/#6633					
Seat Rings (S/D)	403SS/-				403SS/-			403SS/-					
Service Conditions	120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa				-5~38°C W.O.G. 1.73MPa, 149°C W.O.G. 1.48MPa, 260°C W.O.G. 1.18MPa, 343°C W.O.G. 0.86MPa			-5~38°C W.O.G. 2.94MPa, 149°C W.O.G. 2.60MPa, 260°C W.O.G. 2.28MPa, 350°C W.O.G. 2.04MPa			0°C~+80°C 1.4MPa		
Reference Page											Features: Page BR35		
Remarks											Built-in Bypass Valve, Dual Plate Type		

Type	Wafer Check				Wafer Check			Stop Check			Stop Check					
Ductile Iron	20K  Dual				20K  Dual			10K  UB IS RS			10K  BB OS&Y RS					
	Fig				20SWZ			20SWZU			10SYFBF			10SPFBOF		
	End Connection		Wafer (JIS 20K)			Wafer (JIS 20K)			JIS B2239 10K FF			JIS B2239 10K FF				
	inch	mm	L	H	D	L	H	D	L	H	D	L	H	D		
1/2	15							110	137	80						
3/4	20							120	154	100						
1	25							130	178	115						
1 1/2	40	54	128	55				180	207	135						
2	50	56	133	60	56	146	60	230	226	180						
2 1/2	65	60	150	70	60	168	70				216	338	225			
3	80	67	156	70	67	174	70				241	370	250			
4	100	68	169	70	68	187	70									
5	125	83	183	70	83	201	70									
6	150	95	216	80	95	219	80									
8	200	127	243	80	127	247	80									
10	250	140	290	90	140	297	90									
12	300	181	315	90	181	324	90									
14	350	184	330	90	184	337	90									
16	400	191	355	90	191	365	90									
18	450	204	388	90	204	394	90									
Body/Cover/Cap	FCD-S+NBR				FCD-S+NBR			FCD-S			FCD-S					
Hinge Pin/Spring	304SS				SUS420J2/304SS/304SS			420J2			403SS					
Disc	CAC406 or C3531				CF8 or 403SS			403SS+HF			304SS+HF					
Gland Packing	T/#2996NATK				T/#2200K			P/#6118			P/#6118					
Gasket								P/#6633			P/#6633					
Seat Rings (S/D)								304SS+HF/-			A105+HF/-					
Service Conditions	0℃~+80℃ 2.8MPa				80℃ Static Water 2.8MPa, 80℃ W.O.G. 2.0MPa			120℃ Static Water 1.4MPa, 300℃ Steam, Air, Gas, Oil 1.0MPa			120℃ Static Water 1.4MPa, 300℃ Steam, Air, Gas, Oil 1.0MPa					
Reference Page	Features: Page BR35				Features: Page BR35			Features: Page DI16			Features: Page DI16					
Remarks	Built-in Bypass Valve, Dual Plate Type				Built-in Bypass Valve Dual Plate Type			HF: Hard Face with Co-Cr-W Alloy			HF: Hard Face with Co-Cr-W Alloy					

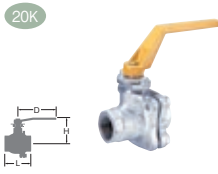
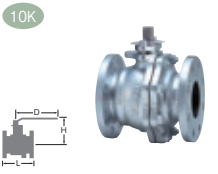
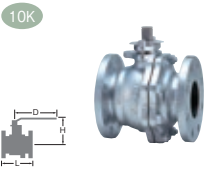
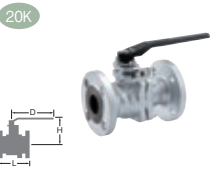
Type	Stop Check				Stop Check			Lift Check			Swing Check		
Ductile Iron		UB IS RS		BB OS&Y RS		UC		BC					
Fig	20SYFB				20SYFBO			20SNDB			20SODB		
End Connection	JIS B2239 20K RF				JIS B2239 20K RF			JIS B2239 20K RF			JIS B2239 20K RF		
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D
1/2	15	110	137	80				110	56				
3/4	20	120	154	100				120	60				
1	25	130	178	115				130	68				
1 1/4	32							160	80				
1 1/2	40	180	207	135				180	85				
2	50	230	226	180				230	99		267	135	
2 1/2	65				292	338	250				292	145	
3	80				318	370	250				318	160	
4	100										356	185	
6	150										444	240	
8	200										533	280	
Body/Cover/Cap	FCD-S				FCD-S			FCD-S/SCS1			FCD-S/S25C or FCD-S		
Hinge Pin/Spring	420J2				403SS								
Disc	403SS+HF				403SS+HF			PTFE			PTFE		
Gland Packing	P/#6118				P/#6118								
Gasket	P/#6633				P/#6633			P/#6633			P/#6633		
Seat Rings (S/D)	304SS+HF/-				A105+HF/-			304SS/-			403SS/-		
Service Conditions	120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa				120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa			120°C LPG 2.4MPa			120°C LPG 2.4MPa		
Reference Page	Features: Page DI16				Features: Page DI16								
Remarks	HF: Hard Face with Co-Cr-W Alloy				HF: Hard Face with Co-Cr-W Alloy			Gas Service			Gas Service		

Type	Strainer					Strainer					Strainer					Strainer				
Ductile Iron																				
Fig	10FDY					10FDYBF					16FDY					16FDYB				
End Connection	BS21 (JIS B0203)					JIS B2239 10K FF					BS21 (JIS B0203)					JIS B2239 16K RF				
inch	mm	L	H	H1*		L	H	H1*			L	H	H1*			L	H	H1*		
1/4	8	65	45	63																
3/8	10	70	45	63																
1/2	15	85	57	81	125	57	81				85	57	81			125	57	81		
3/4	20	100	62	90	140	62	90				100	63	90			140	63	90		
1	25	115	74	111	150	77	114				115	74	111			150	77	114		
1 1/4	32	135	86	130	170	90	134				135	86	131			170	90	134		
1 1/2	40	150	96	141	190	100	145				150	96	141			190	100	145		
2	50	180	112	168	230	137	173				180	111	168			250	158	207		
2 1/2	65	220	190	271	305	207	289									305	208	289		
3	80	250	214	310	360	237	334									360	238	334		
4	100				415	279	387									415	284	387		
5	125				465	321	446									465	324	446		
6	150				515	367	497									515	369	497		
8	200				580	461	631									580	461	631		
10	250				680	534	745									680	534	745		
12	300				800	623	874									800	623	879		
Body/Bonnet/Cap	FCD-S/C3771 or FCD-S					FCD-S/C3771 or FCD-S					FCD-S/C3771 or FCD-S					FCD-S/C3771 or FCD-S				
Disc/Screen	304SS(Punched Plate)					304SS(Punched Plate)					304SS(Punched Plate)					304SS(Punched Plate)				
Gasket	T/#1120 or P/#6633					T/#1120 or P/#6633					T/#1120					T/#1120 or P/#6633				
Service Conditions	120°C Static Water 1.4MPa, 220°C Steam, Air, Gas, Oil 1.0MPa 200°C up to 2 ^B					120°C Static Water 1.4MPa, 200°C Steam, Oil 1.2MPa (11/2 ^B & below), 200°C Air, Gas 1.0MPa (11/2 ^B & below), 220°C Steam, Air, Gas, Oil 1.2MPa (2 ^B & above), 300°C Steam, Air, Gas, Oil 1.0MPa (2 ^B & above)					120°C Static Water 2.2MPa, 200°C Steam, Oil 2.0MPa, 200°C Air, Gas 1.0MPa					120°C Static Water 2.2MPa, 200°C Steam, Oil 2.0MPa (11/2 ^B & below), 200°C Air, Gas 1.0MPa (11/2 ^B & below), 220°C Steam, Air, Gas, Oil 2.0MPa (2 ^B & above), 300°C Steam, Air, Gas, Oil 1.8MPa (2 ^B & above), 350°C Steam, Air, Gas, Oil 1.6MPa (2 ^B & above)				
Remarks	BC: 21/2 ^B & above					BC: 2 ^B & above										BC: 2 ^B & above				

*Height for removing the screen

Type	Strainer					Strainer					Ball					Ball				
Ductile Iron																				
Fig	20FDY					20FDYB					STZ					20ST				
End Connection	BS21 (JIS B0203)					JIS B2239 20K RF					BS21 (JIS B0203)					BS21 (JIS B0203)				
inch	mm	L	H	H1*		L	H	H1*			L	H	D			L	H	D		
1/4	8										46	37	80							
3/8	10	80	63	76	120	63	76				51	37	80							
1/2	15	85	63	76	125	63	76				57	41	100			75	106	130		
3/4	20	100	70	86	140	71	86				65	46	130			80	106	130		
1	25	115	82	103	160	85	105				76	49	130			90	107	130		
1 1/4	32	135	117	122	185	120	126				86	56	130			105	129	160		
1 1/2	40	150	128	135	200	132	138				95	61	130			115	133	160		
2	50	180	153	161	250	164	172				115	68	150			130	114	230		
2 1/2	65				305	221	298													
3	80				360	252	344													
4	100				415	292	397													
5	125				465	333	456													
6	150				515	380	506													
8	200				620	441	610													
10	250				760	548	763													
12	300				870	655	916													
Body/Bonnet/Cap	FCD-S/FCD-S					FCD-S/FCD-S					FCD-S					FCD-S				
Stem											C3531 + Ni-Cr plating					403SS				
Ball/Screen	304SS					304SS					C3771 + Ni-Cr plating					CF8/304SS				
Ball Seat											G/F PTFE					HYPATITE® PTFE				
Gland Packing											PTFE					PTFE				
Gasket	P/#6633					P/#6633					PTFE					PTFE				
Handle											SS430					DI				
Bore											Reduced Bore					Reduced Bore				
Service Conditions	120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa, 300°C Steam, Air, Gas, Oil 2.3MPa, 350°C Steam, Air, Gas, Oil 2.0MPa					120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa, 300°C Steam, Air, Gas, Oil 2.3MPa, 350°C Steam, Air, Gas, Oil 2.0MPa					W.O.G. at Room Temperature 2.75MPa, Saturated Steam 0.98MPa					110°C W.O.G. 2.8MPa, 140°C W.O.G. 2.0MPa				
Remarks	40-mesh					40-mesh														

*Height for removing the screen

Type	Ball				Ball				Ball				Ball			
Ductile Iron																
Fig	20STL				10STBF				10STLBF				20STB			
End Connection	BS21 (JIS B0203)				JIS B2239 10K FF				JIS B2239 10K FF				JIS B2239 20K RF			
inch	mm	L	H	D	L	H	D	D	L	H	D	D	L	H	D	D
1/2	15	75	106	130	108	106	130		108	106	130		140	106	130	
3/4	20	80	106	130	117	109	130		117	109	130		152	109	130	
1	25	90	107	130	127	129	160		127	129	160		165	130	160	
1 1/4	32	105	129	160	140	132	160		140	132	160		178	135	160	
1 1/2	40	115	133	160	165	114	230		165	114	230		190	115	230	
2	50	130	114	230	178	121	230		178	121	230		216	120	230	
2 1/2	65				190	154	400		190	154	400		241	153	400	
3	80	180	154	400	203	163	400		203	163	400		283	162	400	
4	100				229	199	460		229	199	460		305	241	750	
5	125				356	219	460		356	219	460					
6	150				394	292	1000		394	293	1000		403	293	1000	
8	200				457	352	1500		457	352	1500		502	352	1500	
Body & Cap	FCD-S				FCD-S				FCD-S				FCD-S			
Stem	403SS				403SS				403SS				403SS			
Ball	CF8/304SS				CF8/304SS				CF8/304SS				CF8/304SS			
Ball Seat	HYPATITE® PTFE				HYPATITE® PTFE				HYPATITE® PTFE				HYPATITE® PTFE			
Gland Packing/O ring	PTFE + NBR				PTFE				PTFE + NBR				PTFE			
Gasket	PTFE				PTFE				PTFE				PTFE			
Handle	DI				DI/CS				DI/CS				DI/CS			
Bore	Reduced Bore				Full Bore				Full Bore				Full Bore			
Service Conditions	80°C Gas. 2.4MPa				120°C W.O.G. 1.4MPa, 160°C W.O.G. 1.0MPa for up to 4", 140°C W.O.G. 1.0MPa for 5" & over				80°C Gas. 1.18MPa				250°C W.O.G. 2.8MPa			
Remarks	Gas Service								Gas Service							

Type	Ball					Ball					3-Way, 4-Seats, L/T Port Ball					3-Way, 4-Seats, L/T Port Ball					
Ductile Iron	20K   FB	20K   FB	10K   FB	10K   RB																	
					Fig	G-20STB					20STLB					10STB4LAF/10STB4TAF					10STR4LAF/10STR4TAF
End Connection		JIS B2239 20K RF					JIS B2239 20K RF					JIS B2239 10K FF					JIS B2239 10K FF				
inch	mm	L	H	D	B	L	H	D	D	L	H	D	L1	L	H	D	L1				
1/2	15					140	106	130													
3/4	20					152	109	130													
1	25					165	130	160													
1 1/4	32					178	135	160													
1 1/2	40					190	115	230	180	143	400	90									
2	50					216	120	230	200	152	400	100									
2 1/2	65					241	153	400	240	183	460	120									
3	80					283	162	400	260	190	460	130									
4	100					305	241	750	330	259	1000	165									
5	125												340	267	1000	170					
6	150	403	337	310	165	403	293	1000					400	289	1000	200					
8	200	502	414	360	210	502	352	1500					450	334	1500	225					
Body & Cap	FCD-S					FCD-S					FCD-S					FCD-S					
Stem	403SS					403SS					304SS					304SS					
Ball	CF8/304SS					CF8/304SS					CF8					CF8					
Ball Seat	HYPATITE® PTFE					HYPATITE® PTFE					HYPATITE® PTFE					HYPATITE® PTFE					
Gland Packing/O ring	PTFE					PTFE + NBR					PTFE					PTFE					
Gasket	PTFE					PTFE					PTFE					PTFE					
Handle						DI/CS					DI/CS					DI/CS					
Bore	Full Bore					Full Bore					Full Bore					Reduced Bore					
Service Conditions	250°C W.O.G. 2.8MPa					80°C Gas. 2.4MPa					120°C W.O.G 1.0MPa, 150°C W.O.G 0.4MPa					120°C W.O.G 1.0MPa, 150°C W.O.G 0.4MPa					
Reference Page											Port Orientation: Page TECH1					Port Orientation: Page TECH1					
Remarks	Gear Operated					Gas Service					3-Way, 4-Seated, L- or T-Port					3-Way, 4-Seated, L- or T-Port					

What is Ductile Iron ?

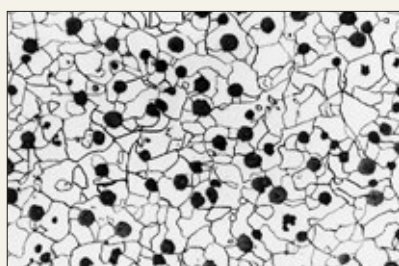
Gray iron, ductile iron, and malleable iron are the three kinds of iron used for valve construction. Unlike gray iron, which has thin, flake-like molecular formations, the metallic structures of both ductile and malleable iron contain nodular graphite. (Refer to the microscopic views shown here.) Ductile and malleable iron have superior mechanical properties compared to gray iron. They have properties almost equivalent to cast steel, which is an expensive material for industrial valves. Furthermore, their superior casting characteristics and ease of machining help to increase their suitability as a valve material.

Ductile iron outperforms malleable iron owing to its better mechanical characteristics for building the valve body, which is a kind of pressure-containing device. For example, ductile iron has a 20% higher tensile strength and 70% to 80% better elongation than malleable iron. This difference is attributed to the different formation processes of nodulated graphite molecules.

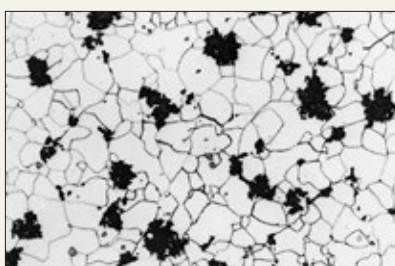
KITZ ductile iron valves are made of JIS FCD-S or ASTM A395 ductile iron. The history of the introduction of ductile iron valves on the market is rather short; however, their demand is steadily increasing owing to their economic advantage as well as the fact that their wide range of service applications is comparable to that of cast steel valves.

This catalog serves to provide the design specifications, construction materials, and external dimensions of the following ductile iron valves and strainers manufactured by KITZ Corporation :

- JIS 10K, 16K, and 20K Gate, Globe, and Check Valves
- JIS 10K and 20K Ball Valves
- JIS 10K, 16K, and 20K Strainers
- ASME 150 and 300 Gate, Globe, and Check Valves



Ductile Iron



Malleable Iron



Gray Iron

Service Recommendation

For achieving higher mechanical shock resistance under high or low temperature and for achieving better tensile strength and elongation characteristics than those of ordinary gray iron valves, the use of ductile iron valves is highly recommended for the following services, sometimes, in place of cast:

- Piping for steam supply
- Air-conditioning and heating systems
- High-pressure gaseous service in general
- Piping for poisonous gas service

The range of high-pressure gaseous service for iron valves is specified by the Ministry of Economy, Trade and Industry of Japan as follows :

Valve Material	Poisonous Gas*	Inflammable Gas	Other Gas
Ductile Iron (JIS FCD-S)	2.4 MPa maximum -5°C to + 350°C		
Ductile Iron (JIS FCD400)	not recommended	1.6 MPa maximum 0°C to + 250°C	
Gray Iron (JIS FC200)	not recommended		0.2 MPa maximum 0°C to + 250°C

*Phosgene and hydrogen cyanide are excluded.

Material Specifications of JIS FCD-S

1. Chemical Composites:

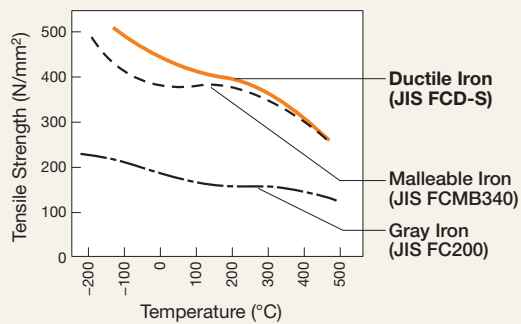
Carbon	: 3.00% minimum
Phosphor	: 0.08% maximum
Silicon	: 2.50% maximum; however, 0.08% may be added for every decrease of 0.01% phosphor within the total maximum of 2.75%

2. Mechanical Properties:

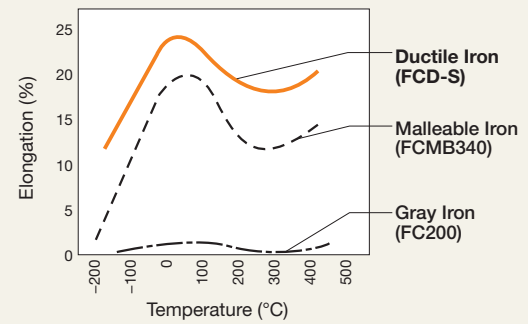
Tensile Strength	: 412 N/mm ² (42 kgf/mm ²) minimum
Yield Strength	: 275 N/mm ² (28 kgf/mm ²) minimum
Elongation	: 18% minimum
Brinell Hardness	: 143 to 187
Charpy Impact Value :	
a) for Ambient Temperature Service;	
17 N·m/cm ² (1.7 kgf·m/cm ²) minimum in an average of three test pieces.	
15 N·m/cm ² (1.5 kgf·m/cm ²) minimum for the lowest impact value.	
b) for -10°C or lower temperature service;	
15.3 N·m/cm ² (1.53 kgf·m/cm ²) minimum in an average of three test pieces.	
13.3 N·m/cm ² (1.33 kgf·m/cm ²) minimum for the lowest impact value.	

Compared Mechanical Properties of JIS Materials

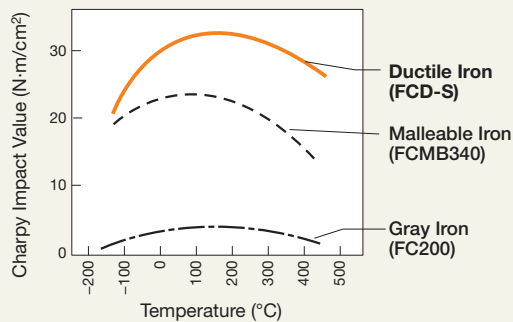
Tensile Strength



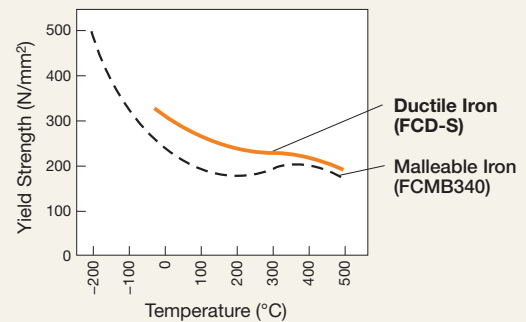
Elongation



Charpy Impact Value



Yield Strength



Design Specifications (Please refer to our website (www.kitz.co.jp) or contact KITZ for details.)

Class	JIS 10K/16K/20K	ASME 150/300
Face to Face Dimension	JIS B 2011, B 2002, or KITZ Std.	ASME B16. 10
End to End Dimension	JIS B 2051 or KITZ Std.	—
End Flange Dimension	JIS B 2239	ASME B16. 5
End Thread Dimension	JIS B 0203	—
Shell Wall Thickness	KITZ Standard, unless otherwise indicated on the following pages	

Uniquely Designed Swing Check Valve: Fig. 10SOZ

Features:

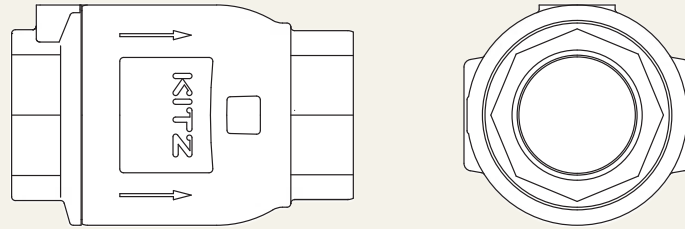
Valve Mounting Orientation : Horizontal and Vertical

Plumbing workability is good

Very compact compared to conventional products

Thermal insulation construction is easy

By having internal hinge pin construction, risks in external leakage is only in body/cap connection.



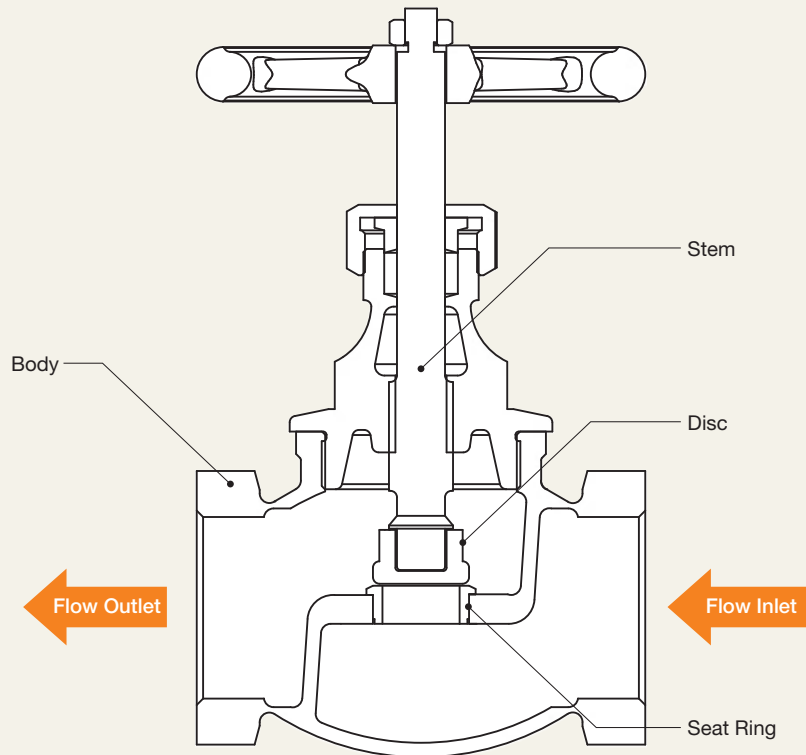
Stop Check Valves: Fig 10SYFBF, 10SPFBOF, 20SYFB, 20SYFBO

Stop check valve is combination of lift check valve and globe valve.

It has a stem in which, when closed prevents disc from coming of the seat and provides tight shutoff (similar to a globe valve).

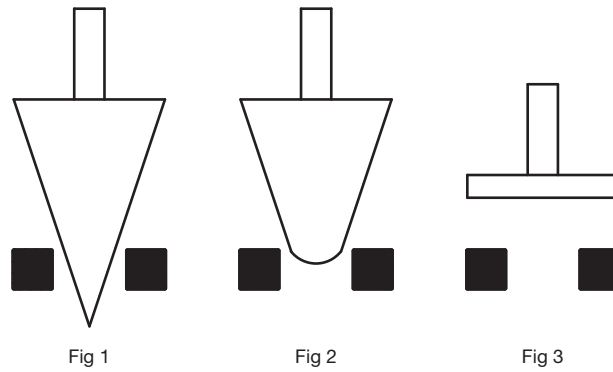
When stem operates to open position, valve operates as a check valve.

Stem is not connected to the disc and functions to close the valve tightly or to limit travel of the disc in open direction.

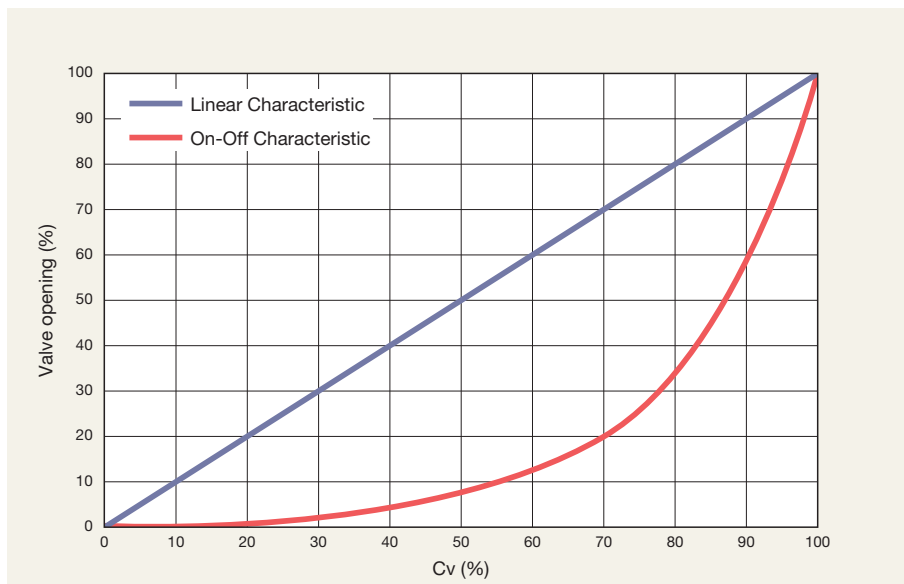


Needle Valve: Fig 10SPNBF

Difference between a needle valve (Fig-1 or Fig-2) and a globe valve (Fig-3) varies in shape of disc as below.



The big difference in needle valve and general globe valve is in flow characteristic. Needle valve is linear characteristic and general globe valve is on-off characteristic. Flow control is better but pressure loss is larger when fully open.



Bellows Seal Globe Valves: 10SPBAWF, 10SPBOWF, 20SYBOW, 20SDBOW, 10SPDBOWF*

Bellow seal valve is a valve with bellows as stem seal and parts. It is often used for high vacuum or nuclear power industry, where strict stem seal is required. Bellows removes influences which changes back pressure that allows valve to protect spring and other internal structure from corrosion and leak flow medium. Substituting stuffing box, bellows is welded with a cover and/or other parts by roll welding or argon arc welding.

* 10/20/150/300UPAW(M), 10/150YPDAW(M)