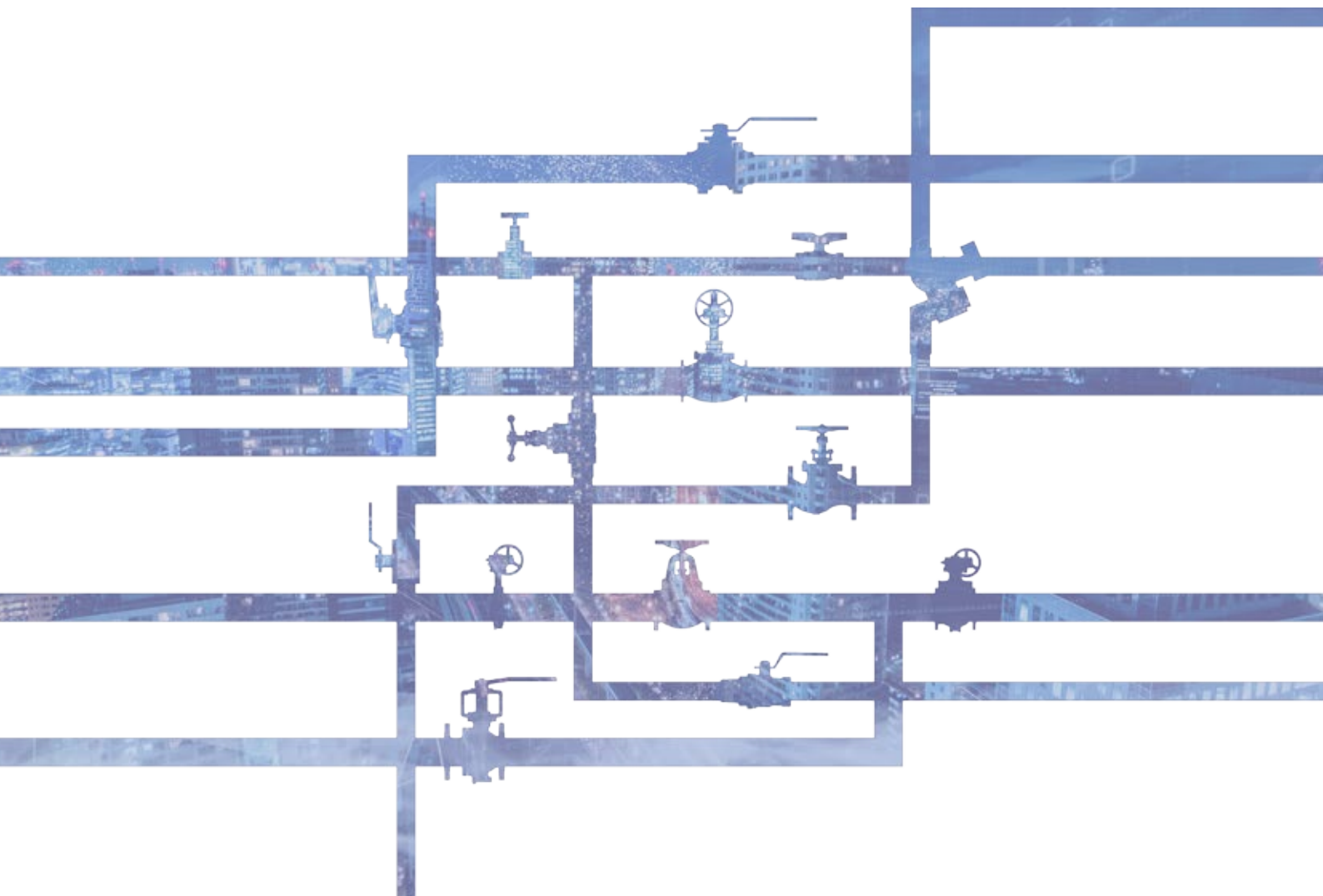


# KITZ

GENERAL CATALOG

## Ductile Iron



# INDEX

DI  
Ductile Iron

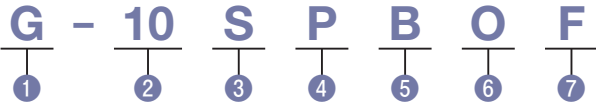
Title	Body Material	Type	Class	End Connection*	Features*	Fig	Remarks	Page
Ductile Iron Valves	DI	Globe	10K Commercial	TE	SB up to 2" or UB, IS, RS	10SJ		DI3 82
				FE/FF		10SJBFB		
			10K	TE	UB, IS, RS	10SP		DI3 82
						10SPBFB		
				FE/FF	BB, OS&Y, RS	10SPBAF	Bellows Seal	
						10SPBAWF		
			16K	TE	US, IS, RS	(G-)10SPBOF	Bellows Seal	DI4 83
				FE/RF	BB, OS&Y, RS	10SPBOWF		
			20K	TE	UB, IS, RS	10SPNBF	Needle	DI4 83
						16SP		
				FE/RF	BB, OS&Y, RS	(G-)16SPBO		
			150	FE/RF	UB, IS, RS	20SY		DI5 84
						20SYB		
			300	FE/RF	BB, OS&Y, RS	20SYBO	Bellows Seal	
						20SYBOW		
			10K Commercial	TE	SB up to 2" or UB, IS, RS	10SD	Soft Seated (PTFE)	DI5 84
						FE/FF		
			20K	FE/RF	BB, OS&Y, RS	20SDBOW	Bellows Seal, Soft Seated (PTFE)	
			10K Commercial	TE	SB, IS, RS	10SDL		DI6 85
						FE/FF		
			20K	TE	UB, IS, RS	20SDL	Soft Seated (PTFE), LPG Service	
		FE/RF				20SDLB		
		10K	FE/RF	BB, OS&Y, RS	20SDLBO			
					TE		UB, IS, RS	10SPD
		150	FE/RF	BB, OS&Y, RS	10SPDBF	Bellows Seal, Soft Seated (PTFE)		
					FE/FF		BB, OS&Y, RS	10SPDBOF
		10K	FE/FF	UB, IS, RS	10SPDBOWF	Soft Seated (PTFE)	DI7 86	
					FE/RF			BB, OS&Y, RS
		20K	FE/RF	UB, IS, RS	10SYBF	Soft Seated (PTFE)		
					FE/FF		BB, OS&Y, RS	10SYBOF
		10K	FE/RF	UB, IS, RS	20SYB	Y Pattern Globe	DI7 86	
					FE/FF			BB, OS&Y, RS
		16K	FE/RF	BB, OS&Y, RS	20SYB			
					TE		SB, IS, RS	10SMS
		20K	FE/RF	BB, OS&Y, RS	10SMAS		DI8 87	
					TE			UB, IS, RS
		150	FE/RF	BB, OS&Y, RS	10SMBF			
					FE/FF		BB, OS&Y, RS	10SMBF
		300	FE/RF	BB, OS&Y, RS	10SMBOF			
					TE		UB, IS, RS	16SMS
		10K Commercial	TE	SC, Lift	16SMB		DI9 88	
					FE/FF			BB, OS&Y, RS
		16K	FE/RF	BB, OS&Y, RS	16SMBO			
					TE		UB, IS, RS	20SLS
		20K	FE/RF	BB, IS, RS	20SLS		DI10 89	
TE	BB, OS&Y, RS				20SLB			
150	FE/RF	BB, OS&Y, RS	20SLBO					
			FE/FF		BB, OS&Y, RS	150SMBO		
300	FE/FF	BB, OS&Y, RS	300SLBO					
			TE		SC, Lift	10SF		
10K Commercial	FE/FF	UC, Lift	10SF		DI9 88			
			TE			BB, IS, RS	10SF	
16K	FE/RF	BB, OS&Y, RS	16SFB					
			TE		UB, IS, RS	16SFB		
10K Commercial	FE/FF	BB, OS&Y, RS	10SN		DI10 89			
			TE			BB, OS&Y, RS	10SNBF	
20K	FE/RF	BB, OS&Y, RS	20SN					
			TE		UB, IS, RS	20SNB		
10K Commercial	FE/FF	Split Body, Swing	10SOZ	Internal Hinge, In line	DI10 89			
			TE			BB, OS&Y, RS	10SRBF	
16K	FE/RF	BB, OS&Y, RS	16SRB					
			TE		UB, IS, RS	20SOB		
20K	FE/RF	BB, OS&Y, RS	150SRB		DI11 90			
			FE/FF			BB, OS&Y, RS	300SOB	
150	FE/FF	BB, OS&Y, RS	10SWZU	Available to install low & high torque spring depending on fluid conditions.				
			TE		UB, IS, RS, Stop Check	10SYFB		
300	FE/FF	BB, OS&Y, RS	20SWZ					
			FE/RF		BB, OS&Y, RS, Stop Check	10SPFBOF		
10K	FE/RF	BB, OS&Y, RS	20SWZU		DI11 90			
			TE			UB, IS, RS, Stop Check	20SYFB	
20K	FE/RF	BB, OS&Y, RS	20SYFBO					
			FE/FF		BB, OS&Y, RS, Stop Check	20SYFBO		
10K	FE/FF	UC, Lift	20SNDB	Soft Seated (PTFE), LPG Service	DI11 90			
			TE			BB, OS&Y, RS, Stop Check	20SYFBO	
20K	FE/RF	BC, Swing	20SODB					
			FE/FF		BB, OS&Y, RS, Stop Check	20SYFBO		
10K Commercial	TE	SC up to 2" or BC	10FDY	Y Pattern, Screen: Punched Stainless Steel Plate	DI12 91			
			FE/FF			BB, OS&Y, RS, Stop Check	10SPFBOF	
16K	FE/RF	BB, OS&Y, RS, Stop Check	16FDY					
			TE		UB, IS, RS, Stop Check	20SYFB		
20K	FE/RF	BB, OS&Y, RS, Stop Check	20FDY	Y Pattern, Screen: 40 mesh wire cloth				
			FE/FF		BB, OS&Y, RS, Stop Check	20SYFBO		
Type 400	TE	RB, Split Body	20STL	Gas Service	DI13 92			
			FE/RF			BB, OS&Y, RS, Stop Check	20SYFBO	
20K	FE/RF	BB, OS&Y, RS, Stop Check	20ST					
			TE		UB, IS, RS, Stop Check	20SYFB		
10K	FE/FF	FB, Split Body, Side Entry	10STLBF	Gas Service				
			FE/RF		BB, OS&Y, RS, Stop Check	20SYFBO		
20K	FE/RF	BB, OS&Y, RS, Stop Check	(G-)20STB	Gas Service				
			FE/FF		UB, IS, RS, Stop Check	20SYFB		
10K	FE/FF	FB, 3-Way 4-Seat	20STLB	Gas Service				
			FE/RF		BB, OS&Y, RS, Stop Check	20SYFBO		
RB, 3-Way 4-Seat	FE/FF	RB, 3-Way 4-Seat	10STB4LAF/TAF		DI13 92			
			FE/RF			BB, OS&Y, RS, Stop Check	20SYFBO	

\* (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

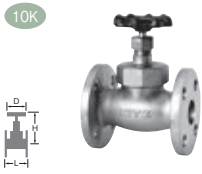
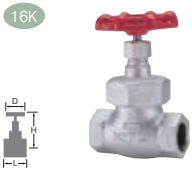
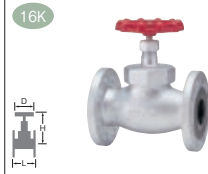
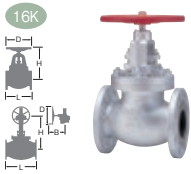
### 7 Surface of End Flange

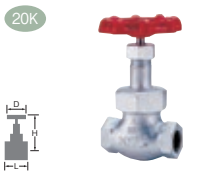
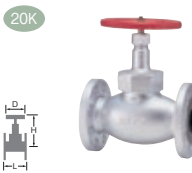
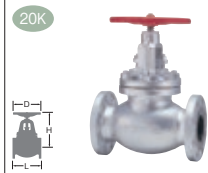
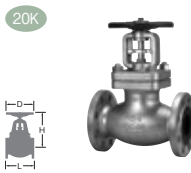
- None ..... Raised Face\*
- F ..... Flat Face

\* 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						64	107	60		108	107	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 <sup>B</sup> , UB 21/2 <sup>B</sup> & over					SB up to 2 <sup>B</sup> , UB 21/2 <sup>B</sup> & 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 <sup>B</sup> & 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 D117													
Remarks											*Gear: 10 <sup>B</sup> & over			

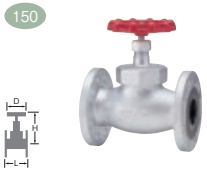
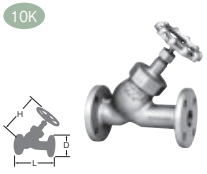
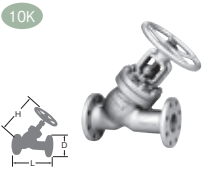
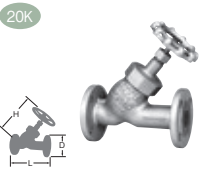
Type	Globe				Globe			Globe			Bellows Seal Globe		
Ductile Iron													
Fig	20SY				20SYB			20SYBO			20SYBOW		
End Connection	BS21 (JIS B0203)				JIS B2239 20K RF			JIS B2239 20K RF			JIS B2239 20K RF		
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D
3/8	10	75	136	70	110	136	70				110	184	90
1/2	15	78	138	80	110	138	80				120	184	90
3/4	20	91	157	100	120	157	100				130	190	100
1	25	105	180	115	130	178	115				160	238	140
1 1/4	32	122	205	135	160	202	135				180	238	140
1 1/2	40	135	210	135	180	210	135				230	271	160
2	50	160	240	180	230	239	180	267	296	225	292	285	180
2 1/2	65							292	343	250	318	395	250
3	80							356	452	300	400	529	350
4	100							444	601	400	559	749	450
5	125												
6	150												
8	200												
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 D117		
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		



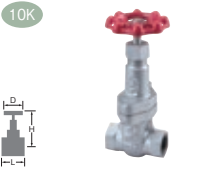
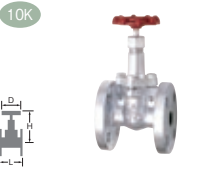
Type	Globe					Globe					Globe					Globe				
Ductile Iron																				
Fig	150SPB					150SPBO					300SYB					300SYBO				
End Connection	ASME B16.5 CL150 RF					ASME B16.5 CL150 RF					ASME B16.5 CL300 RF					ASME B16.5 CL300 RF				
inch	mm	L	H	D		L	H	D		L	H	D		L	H	D		L	H	D
1/2	15	108	122	80						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		L	H	D
1/4	8	50	108	60										55	112	55				
3/8	10	55	108	60	85	108	60							65	122	60				
1/2	15	65	123	70	85	122	70	110	184	90				80	130	70				
3/4	20	80	123	80	95	124	80	120	184	90				90	149	80				
1	25	90	144	90	110	146	90	130	190	100				105	169	90				
1 1/4	32	105	159	100	130	161	100	160	238	140				120	187	100				
1 1/2	40	120	178	115	150	181	115	180	238	140				140	205	115				
2	50	140	197	135	180	198	135	230	271	160										
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 <sup>3</sup> , UB 21/2 <sup>3</sup> & 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						
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		

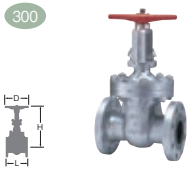
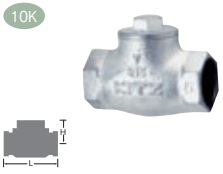
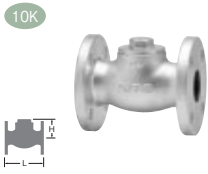
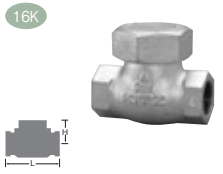
Type	Globe					Y Globe			Y Globe			Y Globe		
Ductile Iron														
Fig	150SPDB					10SYYBF			10SYYBOF			20SYYB		
End Connection	ASME B16.5 CL150 RF					JIS B2239 10K FF			JIS B2239 10K FF			JIS B2239 20K RF		
inch	mm	L	H	D		L	H	D	L	H	D	L	H	D
1/2	15	108	127	70										
3/4	20	117	135	70										
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		

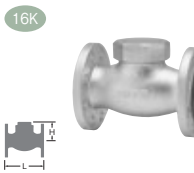
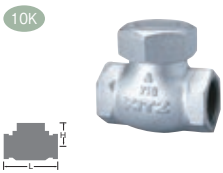
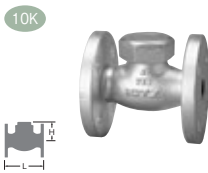
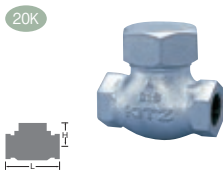
Type	Y Globe					Gate			Gate			Gate		
Ductile Iron														
Fig	20SYYBO					10SMS			10SMAS			10SMBF		
End Connection	JIS B2239 20K RF					BS21 (JIS B0203)			BS21 (JIS B0203)			JIS B2239 10K FF		
inch	mm	L	H	D		L	H	D	L	H	D	L	H	D
1/2	15				60	150	60	65	161	70	70	90	161	70
3/4	20				70	170	70	75	162	70	70	100	162	70
1	25				75	197	80	80	184.5	80	80	110	185	80
1 1/4	32				85	232	90	90	215	90	90	120	216	90
1 1/2	40				95	274	100	100	250	110	110	130	251	100
2	50	280	311	225	105	316	115	110	285	115	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					403SS/-			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													

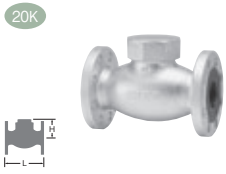
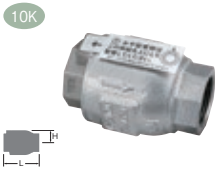
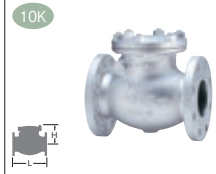
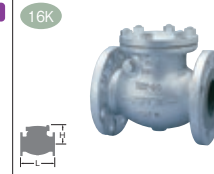


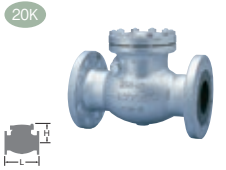
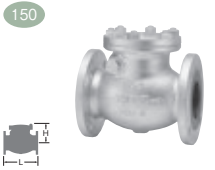
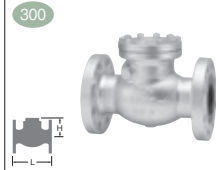
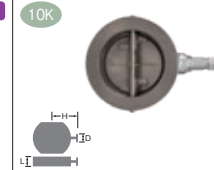
Type	Gate			Gate			Gate			Gate			
Ductile Iron													
Fig	10SMBOF			16SMS			16SMB			16SMBO			
End Connection	JIS B2239 10K FF			BS21 (JIS B0203)			JIS B2239 16K RF			JIS B2239 16K RF			
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D
1/2	15				65	163	70	108	163	70			
3/4	20				75	182	80	117	164	70			
1	25				80	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			

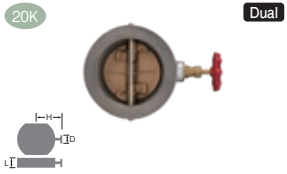



Type	Gate			Gate			Gate			Gate			
Ductile Iron													
Fig	20SLS			20SLB			20SLBO			150SMBO			
End Connection	BS21 (JIS B0203)			JIS B2239 20K RF			JIS B2239 20K RF			ASME B16.5 CL150 RF			
inch	mm	L	H	D	L	H	D	L	H	D	L	H	D
1/2	15	70	175	90	108	176	90						
3/4	20	75	177	90	117	177	90						
1	25	85	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														
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														
Fig	16SFB					10SN			10SNBF			20SN		
End Connection	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					56	162	70
2	50	267	133		203	125		267	133		56	168	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													
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°C~+80°C 2.8MPa			80°C Static Water 2.8MPa, 80°C W.O.G. 2.0MPa			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 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													
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			403SS			403SS			
Disc	403SS+HF			403SS+HF			PTFE			PTFE			
Gland Packing	P/#6118			P/#6118			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			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														
	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	P/#5650 or P/#6633					P/#6633 or P/#5650			P/#5650			P/#6633 or P/#5650		
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 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa			120°C Static Water 2.2MPa, 220°C Steam, Air, Gas, Oil 2.0MPa		
Remarks	BC: 21/2 <sup>B</sup> & above					BC: 2 <sup>B</sup> & above						BC: 2 <sup>B</sup> & above		

\*Height for removing the screen

Type	Strainer					Strainer			Ball			Ball		
Ductile Iron														
	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 <sup>®</sup> 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					120°C Static Water 2.8MPa, 220°C Steam, Air, Gas, Oil 2.5MPa			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	L	H	D	L	H	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																
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	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				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 ?

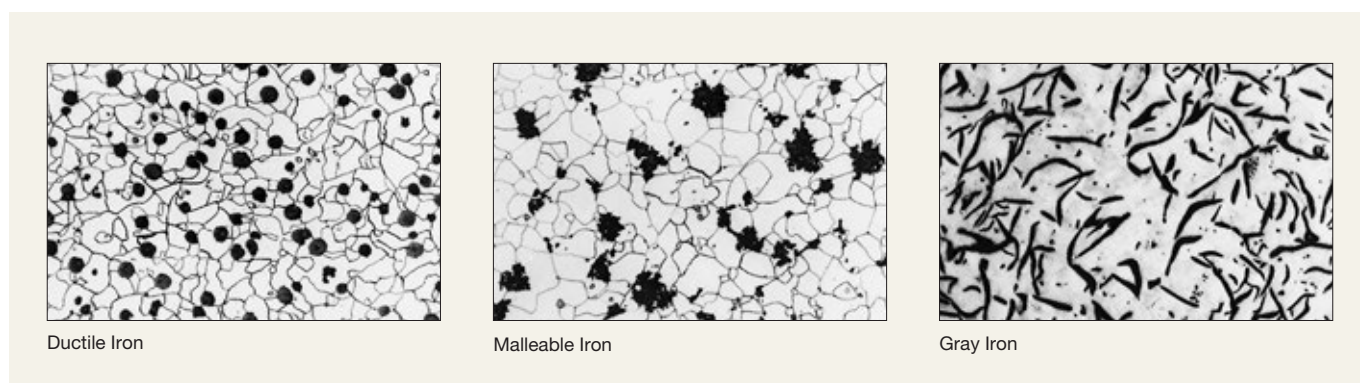
Gray iron, ductile iron, and malleable iron are the three kinds of iron used for valve construction. Unlike gray iron, which has thin, flake-like molecular formations, the metallic structures of both ductile and malleable iron contain nodular graphite. (Refer to the microscopic views shown here.) Ductile 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



## 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:

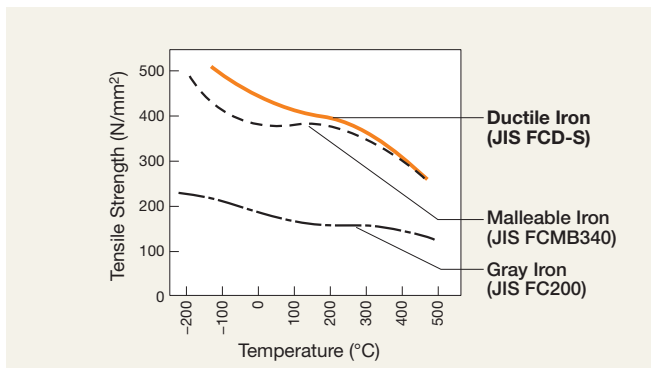
Tensile Strength : 412 N/mm<sup>2</sup> (42 kgf/mm<sup>2</sup>) minimum  
 Yield Strength : 275 N/mm<sup>2</sup> (28 kgf/mm<sup>2</sup>) minimum  
 Elongation : 18% minimum  
 Brinell Hardness : 143 to 187  
 Charpy Impact Value :  
 a) for Ambient Temperature Service;  
 17 N·m/cm<sup>2</sup> (1.7 kgf·m/cm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

DI

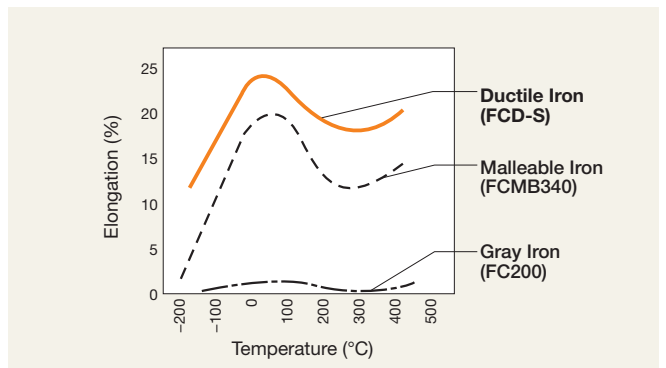
Ductile Iron

## Compared Mechanical Properties of JIS Materials

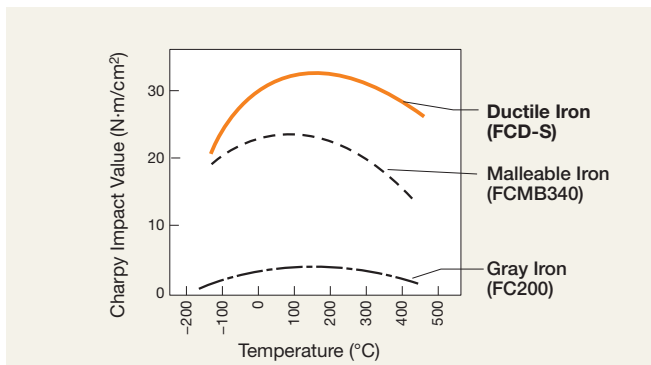
### Tensile Strength



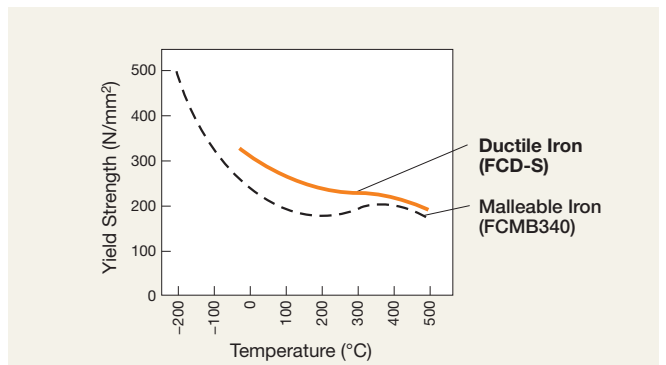
### Elongation



### Charpy Impact Value



### Yield Strength



## Design Specifications (Please refer to our website ([www.kitz.co.jp](http://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:

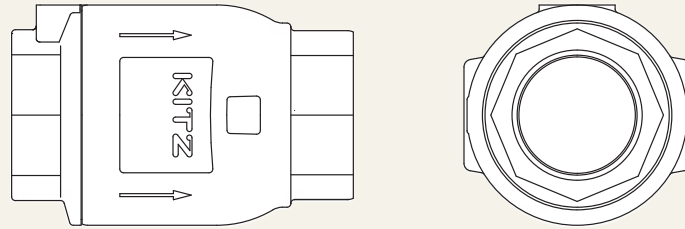
Valve Mounting Orientation : Horizontal and Vertical

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.



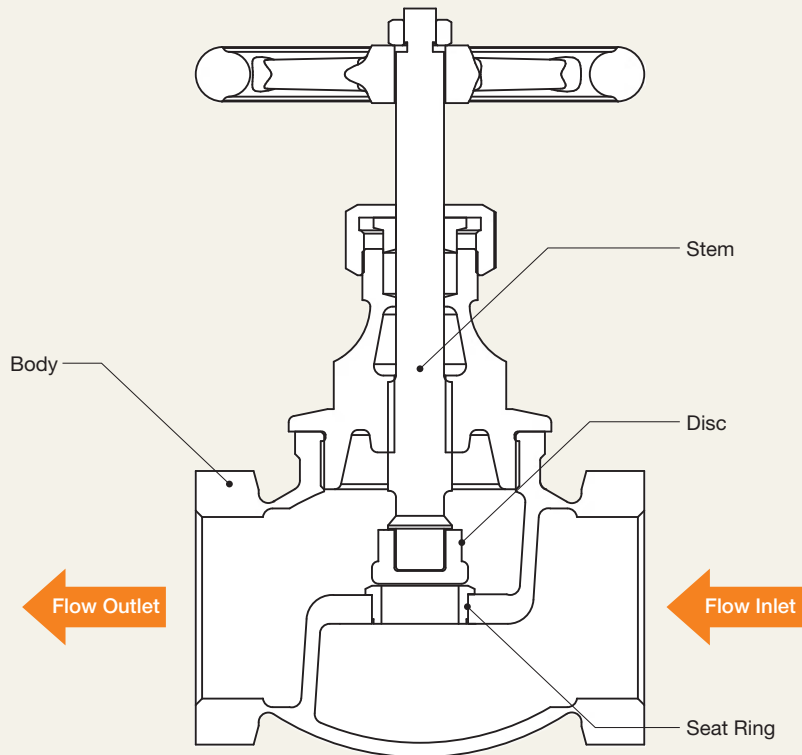
## Stop Check Valves: Fig 10SYFBF, 10SPFBOF, 20SYFB, 20SYFBO

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).

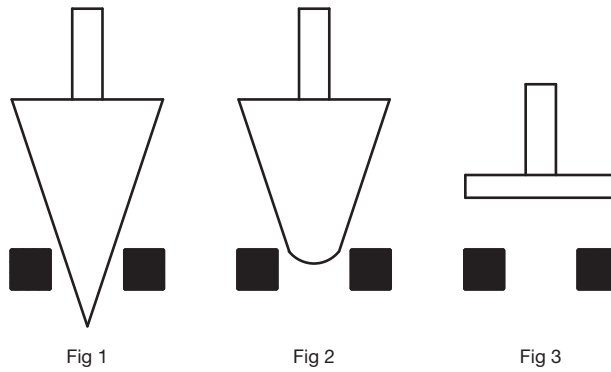
When stem operates to open position, valve operates as a check valve.

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

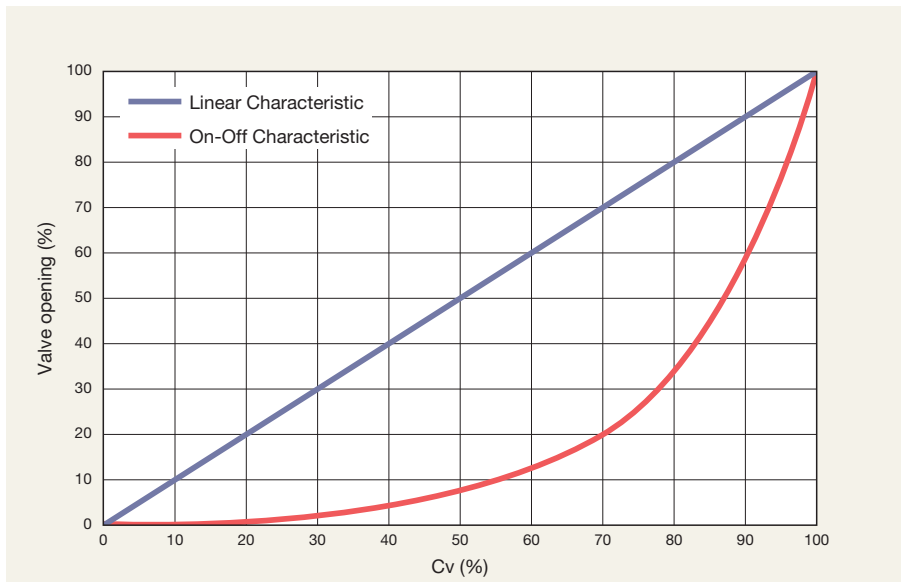


## Needle Valve: Fig 10SPNBF

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)