

Shipbuilding – Cast steel valves

1. Scope This Japanese Industrial Standard specifies marine cast steel valves used for steam, fresh water, sea water, oil and air piping systems.

Remarks: This standard makes reference to the following standards:

- JIS B 0205 – Metric coarse screw threads
- JIS B 0207 – Metric fine screw threads
- JIS B 0216 – Metric trapezoidal screw threads
- JIS B 0222 – 29° trapezoidal screw threads
- JIS B 1532 – Rolling bearings – Thrust ball bearings with flat back faces
- JIS B 1575 – Grease nipples
- JIS B 1701 – Involute gear tooth profile and dimensions
- JIS B 2210 – Basic dimensions of ferrous material pipe flanges
- JIS F 7102 – Shipbuilding—Piping system in machinery space—Application for gaskets and packing
- JIS F 7400 – Shipbuilding—Valves and cocks—General inspection requirement
- JIS G 3101 – Rolled steel for general structure
- JIS G 3452 – Carbon steel pipes for ordinary piping
- JIS G 3505 – Low carbon steel wire rods
- JIS G 3506 – High carbon steel wire rods
- JIS G 4051 – Carbon steels for machine structural use
- JIS G 4105 – Chromium molybdenum steels
- JIS G 4303 – Stainless steel bars
- JIS G 4305 – Cold rolled stainless steel plates, sheets and strip
- JIS G 4404 – Alloy tool steels
- JIS G 5101 – Carbon steel castings
- JIS G 5121 – Stainless steel castings
- JIS G 5151 – Steel castings for high temperature and high pressure service
- JIS G 5501 – Grey iron castings
- JIS G 5502 – Spheroidal graphite iron castings
- JIS H 3100 – Copper and copper alloy sheets, plates and strips
- JIS H 3250 – Copper and copper alloy rods and bars
- JIS H 3260 – Copper and copper alloy wires
- JIS H 5102 – High strength brass castings
- JIS H 5111 – Bronze castings

2. Classification Cast steel valves shall be classified as given in **Attached Table 1** by a combination of valve type, nominal pressure and nominal size.

3. Pressure rating The relationships between fluid condition of cast steel valves and maximum working pressure shall be as given in **Attached Tables 2** through **7**.

4. Construction, shape and dimensions The construction, shape and dimensions of cast steel valves shall be as given in **Attached Table 1**.

5. Materials The materials of cast steel valves shall be as given in **Attached Table 1**.

6. Tests and inspection Cast steel valves shall be inspected on the following items (1) through (5) in accordance with the requirements of **JIS F 7400**.

- (1) Material inspection

- (2) Visual inspection
- (3) Dimensional inspection
- (4) Assembly inspection
- (5) Hydraulic inspection

- (a) Watertight inspection for valve seat Cast steel valves with a nominal diameter of 50 or less may be subjected to air leakage tests instead of water leakage tests for valve seats.
- (b) Hydraulic inspection for body Hydraulic inspection shall be carried out at the test pressures given in **Attached Table 1**.

7. Designation Cast steel valves shall be designated by title, nominal pressure, nominal dia, type, material symbol or abbreviation.

Designations and abbreviations of cast steel valves shall be as given in **Attached Table 8**.

8. Marking The following particulars shall be marked on the surface of a cast steel valve.

- (1) The particulars given in **Attached Table 9** shall be marked on the surface of the body of a cast steel valve.
- (2) A screw-down check globe valve and a screw-down check angle valve shall have cross-recessed grooves, which shall be painted black at the heads of valve stems to indicate that they are check valves.

Valves of the piston guide type shall have V-grooves on the circumferential side of the head of the stem.

Gate valve	20 to 50	5%	Attached Fig. 16	The permissible dimensional deviation of thickness δ of the body shall be 0.5%. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be up to 1 mm. Fully bonnet and disc shall be provided with suitable ribs if necessary.
Ball globe valves and ball angle valves	20 to 50	5%	Attached Fig. 18 or 20	The permissible dimensional deviation of thickness δ of a body shall be 0.5%. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be up to 1 mm.
Ball plug valves	20 to 50	5%	Attached Fig. 22	The permissible dimensional deviation of thickness δ of the body shall be 0.5%. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be up to 1 mm. Fully bonnet and disc shall be provided with suitable ribs if necessary.
Globe or valve and angle valve	20 to 50	5%	Attached Fig. 20	The permissible dimensional deviation of thickness δ of the body shall be 0.5%. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be up to 1 mm.

Note: 1. Ground stem type

2. Flange gate type

Remarks: 1. Nominal diameter (mm)

2. Working pressure (MPa) shall be 0.50 MPa.

3. Class II on the subject

Attached Table 1 Type, nominal pressure, nominal diameter, type symbol of marine valve, material, test pressure, construction, shape and dimensions of cast steel valves

Type	Nominal pressure	Nominal diameter										Type symbol of marine valve	Materials	Test pressure MPa		Construction, shape and dimensions				
		32, 40	50, 65, 80	100	125	150	200	250	300	350, 400	450, 500, 550, 600, 650, 700, 750, 800			Watertightness inspection of valve seat	Hydraulic inspection of body	Reference Fig. No.	Others			
Globe valve and angle valve	5 K								○	○		FGS FLS	The materials of body, bonnet, disc, valve seat and stem shall be as shown in Attached Fig. 2. The materials shown in parentheses may be used for discs, valve seats and stems if the purchaser so instructs. In this case, the valve seat shall be deposited with stainless steel.	0.76	1.04	Attached Fig. 1	The permissible dimensional deviation of thickness a of the body shall be $\pm 1\%$. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be up to 1 mm.			
	10 K		○	○	○	○	○	○	○			The materials of body, bonnet, disc, valve seat and stem shall be as shown in Attached Fig. 4. For valves with a nominal diameter of 250 or more, SC480 specified in JIS G 5101 may be used for the disc and the valve seat. In this case, the valve seat shall be deposited with stainless steel.	1.51	2.06	Attached Fig. 3					
	20 K	○	○	○	○	○	○	○				The materials of body, bonnet, disc and stem shall be as shown in Attached Fig. 7	3.67	5.00	Attached Fig. 5 or Attached Fig. 6					
	30 K			○	○	○						The materials shall, in principle, be as shown in Attached Fig. 9.	4.96	6.76	Attached Fig. 8					
	40 K	○	○	○	○	○						The materials shall, in principle, be as shown in Attached Fig. 11. The materials of carbon steel body, bonnet and disc of valves used for steam lines with a temperature exceeding 350°C shall conform to JIS G 5151-SCPH2.	6.69	9.12	Attached Fig. 10					
Screw-down check globe valve and screw-down check angle valve	10 K	(○)	○	○	○	○	○	○			FGSN FLSN	The materials of body, bonnet, disc, valve seat and stem shall be as shown in Attached Fig. 13.	1.51 from below disc. Reducing from 1.51 to 0.39 from above disc.	2.06	Attached Fig. 12					
	20 K	○	○	○	○	○	○	○				The materials of body, bonnet, disc, valve seat and stem shall be as shown in Attached Fig. 15.	3.66 from below disc. Reducing from 3.66 to 0.98 from above the disc with the stem at the fully open position.	5.00	Attached Fig. 14					
Gate valve	10 K		○	○	○	○	○	○	○	○		FSS	The materials of body, bonnet and main components (disc, valve seat and stem) shall be as shown in Attached Fig. 17. Materials are divided into Class B and Class S according to their composition. However, valve seats in Class S may be built by directly depositing alloy metal on body and disc. Furthermore, valve seats (fitted to discs) of valves with a nominal diameter of 200 or less may be integrated with discs. In this case, the material of the discs shall be the same as that of the valve seats.	1.51. For valves with a nominal diameter of 300 or more, however, the pressure designated by the purchaser, if lower than the specified pressure, may be used.	2.06	Attached Fig. 16	The permissible dimensional deviation of thickness a of the body shall be $\pm 1\%$. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be up to 1 mm. Body, bonnet and disc shall be provided with suitable ribs if necessary.			
Hull globe valves and hull angle valves	—	Globe valve	○	○	○	○	○	○	○	○		FGSHF FLSHF	The materials of body, bonnet and main components (disc, valve seat and stem) shall be as shown in Attached Figs. 19 and 21. Materials are divided into Class B and Class S according to their composition. Material in Class S may be either of the following: (a) Discs and valve seats of valves with a nominal diameter of 200 or more shall conform to JIS G 5101-SC480. In this case, valve seats shall be deposited with austenitic stainless steel. (b) Valve seats of bodies and discs of valves with a nominal diameter of 200 or more shall be built up by directly depositing austenitic stainless steel. (c) Rubber seats are directly embedded into the bodies of valves with a nominal diameter of 350 or more. In this case, the contact faces of bodies and valve seats are deposited with austenitic stainless steel.	Division	B	S	B	S	Attached Fig. 18 or 20	The permissible dimensional deviation of the thickness a of a body shall be $\pm 1\%$. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be up to 1 mm.
			Nominal dia. of 300 or less	1.08		1.47														
Nominal dia. of 250, 300	0.76	1.08	1.03	1.47																
Nominal dia. of 350 or more	0.25		0.5																	
Hull gate valves	—		○	○	○	○	○	○	○	○		FSSHf	The materials of body, bonnet and main components (disc, valve seat and stem) and screwed piece shall be as shown in Attached Figs. 23, 25 and 27. Materials are divided into Class B and Class S according to their composition. However, valve seats in Class S may be built by directly depositing austenitic stainless steel on body and disc. Furthermore, valve seats (fitted to discs) of valves with a nominal diameter of 200 or less may be integrated with discs. In this case, the material of discs shall be the same as valve seats.	Division	Watertightness inspection of valve seat	Hydraulic inspection of body	Attached Fig. 22, 24 or 26	The permissible dimensional deviation of thickness a of the body shall be $\pm 1\%$. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be permitted up to 1 mm. Body, bonnet and disc shall be provided with suitable ribs if necessary. Valves with a nominal diameter of 550 to 800 shall be provided with a bevel gear.		
			Nominal dia. of 400 or less	1.08	1.47															
			Nominal dia. of 450 or more	0.25	0.50															
			When the specified test pressure for a watertightness inspection of valve seats is not applicable to valves with a nominal diameter of 450 or more, test pressures may be determined through consultation with the purchaser.																	
Globe air valve and angle air valve	Globe valve	—	○	○	○	○	○				FGSA FLSA	The materials of body, bonnet, disc and stem shall be as shown in Attached Fig. 29.	4.96	6.76	Attached Fig. 28	The permissible dimensional deviation of the thickness a of a body shall be $\pm 1\%$. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be permitted up to 1 mm.				
	Angle valve	—	○	○	○	○	○													

Note (○): Guided stem type

(○): Piston guide type

Remarks: 1. Nominal diameter columns marked ○ are covered by this standard.

2. Watertightness inspection of valve seat When valves with a nominal diameter of 50 are subjected to air leakage inspections substituting for a watertightness inspection of valve seat, the test pressure shall be 0.59 MPa.

3. Class B in the tables indicates that copper alloy metals are used for the main components, while Class S indicates that stainless steels are used for these main components.



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Attached Table 2 Globe valve and angle valve

Fluid condition	Maximum working pressure MPa							
	Nominal pressure							
	5 K	10 K	20 K	30 K		40 K		
	Materials of body							
	Carbon steel	Carbon steel	Carbon steel	Carbon steel	Molybdenum steel	Carbon steel	Molybdenum steel	Chromium molybdenum steel
Steam at 490°C	—	—	—	—	—	—	—	3.92
Steam at 475°C							3.92	4.12
Steam at 450°C					3.33			4.41
Steam at 425°C				2.94	3.53	3.92		4.71
Steam at 400°C			2.26	3.33	3.73	4.51		5.0
Steam at 350°C			2.55	3.82		5.10		
Steam at 300°C		0.98	2.84	4.22		5.59		
Steam at 220°C or less		1.18	3.04	4.51		6.08		
Air/Gas								
Oil and pulsating water	0.49							
Non-shock water at 120°C or less	0.69	1.37	3.33					

Remark: For intermediate values of temperature and pressure, the maximum working pressure or temperature may be determined by interpolation

Attached Table 3 Screw-down check globe valve and angle valve

Fluid condition	Maximum working pressure MPa	
	Nominal pressure	
	10 K	20 K
Steam at 350°C	—	2.55
Steam at 300°C	0.98	2.84
Steam at 220°C or less	1.18	3.04
Air, gas, oil and pulsating water		
Non-shock water at 120°C or less	1.37	3.33

Remarks: 1. For intermediate values of temperature or pressure in the table, the maximum working pressure or temperature may be determined by interpolation.
2. When BC6 is used for a guide, the fluid condition shall be 205°C or less.

Attached Table 4 Gate valve

Fluid condition	Maximum working pressure MPa	
	Nominal pressure	
	10 K	
	Nominal dia.	
	200 or less	250 or more
Saturated steam	0.69	0.49
Oil and pulsating water	0.98	
Non-shock water of 120°C or less	1.37	

Attached Table 5 Hull globe valve and angle valve

Fluid condition	Maximum working pressure MPa					
	Nominal dia.					
	200 or less		250, 300		350 or more	
	Class					
	B	S	B	S	B	S
Sea water and bilge	0.98		0.69	0.98	0.2	

Remark: For Class B and Class S, see 5. Material.

Attached Table 6 Gate valve on ship's bottom and sides

Fluid condition	Maximum working pressure MPa			
	Nominal dia.			
	400 or less		450 or more	
	Class			
	B	S	B	S
Sea water and bilge	0.98		0.2	

Attached Table 7 Air globe valve and angle valve

Fluid condition	Maximum working pressure MPa
Air	4.51

Attached Table 8 Designation and abbreviation of products

Designation	Abbreviation
Marine cast steel 5K-250 globe valve	FGS5250
Marine cast steel 10K-80 angle valve	FLS1080
Marine cast steel 10K-200 screw-down check angle valve of the piston guide type	FLSN10200P
Marine cast steel 40K-80 chromium molybdenum steel angle valve	FLS4080CM
Marine cast steel 10K-50 gate valve B	FSS1050B
Marine cast steel 450 hull globe valve S	FGSHF0450S
Marine cast steel 600 hull gate valve (with bevel gear) B	SGSHF0600BK
Marine cast steel 32 air globe valve	FGSA032

Remarks: 1. Designation of abbreviations shall be as shown below:

☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ⁽¹⁾
 ① ② ③ ④ ⑤ ⑥ ⑦

① Abbreviation indicating marine equipment

F: Marine equipment

② Abbreviation to indicate type

G: Glove valve

S: Gate valve

L: Angle valve

③ Abbreviation indicating materials of body (cage)

S: Cast steel

④ Abbreviation indicating application or shape

N: Check valve

A: Air valve

HF: Hull valve

⑤ Abbreviation indicating nominal pressure (Example)

0: Nominal pressure unspecified

40: Nominal pressure of 10K

⑥ Abbreviation indicating nominal diameter (Example)

32: Nominal diameter of 32

350: Nominal diameter of 350

⑦ Abbreviation indicating special remarks

○ Materials of body

M: Molybdenum steel

CM: Chromium molybdenum steel

○ Materials of main components

B: Class B

S: Class S

○ Others

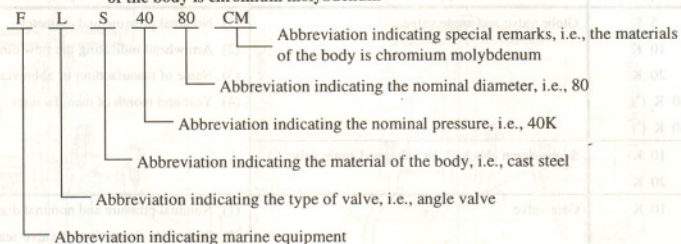
P: Piston guide type

K: Provided with bevel gear

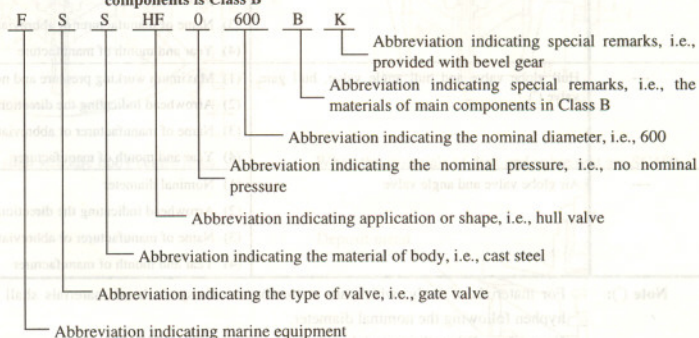
Note ⁽¹⁾: The number of symbol ☐ is the number of designated items, but when the number is small, or some are missing, designation shall be made by shifting the remaining numbers leftwards.

2. Examples of designation using abbreviations

Example 1. Marine cast steel 40K angle valve with a nominal diameter of 80 when the material of the body is chromium molybdenum



Example 2. Marine cast steel gate valve with a nominal diameter of 600 and the material of main components is Class B



Unit	mm										Unit
	1	2	3	4	5	6	7	8	9	10	
NPS	1/2	3/4	1	1 1/2	2	2 1/2	3	4	6	8	NPS
	12.7	19.0	25.4	38.1	50.8	63.5	76.2	101.6	152.4	203.2	
DN	15	20	25	40	50	65	80	100	150	200	DN
	15	20	25	40	50	65	80	100	150	200	
Weight	0.12	0.18	0.25	0.45	0.60	0.85	1.20	1.80	3.50	5.50	Weight
	0.12	0.18	0.25	0.45	0.60	0.85	1.20	1.80	3.50	5.50	

- Remarks:
1. Flange shall conform to JIS B 2210 for a nominal pressure 5K. However, when used as valves for fitting on ship's hull and side, flange conforming to JIS B 2210, 10K may be used.
 2. Threads d_1 shall conform to JIS B 0216. Those may conform to JIS B 0222, but this is not acceptable for fully designed ones.
 3. Threads d_2 and d_3 shall conform to JIS B 0205.
 4. The upper data represent dimensions in calculated centers of globe valves, while the lower data represent those of angle valves.
 5. Dimension L and K apply to globe valves. Dimensions L_1 and L_2 apply to angle valves.

Attached Fig. 1 Construction, shape and dimensions of 5K globe valve and angle valve

Attached Table 9 Designation items

Nominal pressure	Type of valve	Designation items
5 K 10 K 20 K 30 K (°) 40 K (°)	Globe valve and angle valve	(1) Nominal pressure and diameter (2) Arrowhead indicating the flow direction (3) Name of manufacturer or abbreviated tradename (4) Year and month of manufacturer
10 K 20 K	Screw-down check globe valve and angle valve (°)	
10 K	Gate valve	(1) Nominal pressure and nominal diameter (2) Watertight inspection of valve seat and test pressure (To be indicated only when the nominal diameter is 300 or more and the test pressure is designated by the purchaser.) (3) Name of manufacturer or abbreviated tradename (4) Year and month of manufacture
—	Hull globe valve and hull angle valve, hull gate valve (°)	(1) Maximum working pressure and nominal diameter (2) Arrowhead indicating the direction of flow (3) Name of manufacturer or abbreviated tradename (4) Year and month of manufacturer
—	Air globe valve and angle valve	(1) Nominal diameter (2) Arrowhead indicating the direction of flow (3) Name of manufacturer or abbreviated tradename (4) Year and month of manufacturer

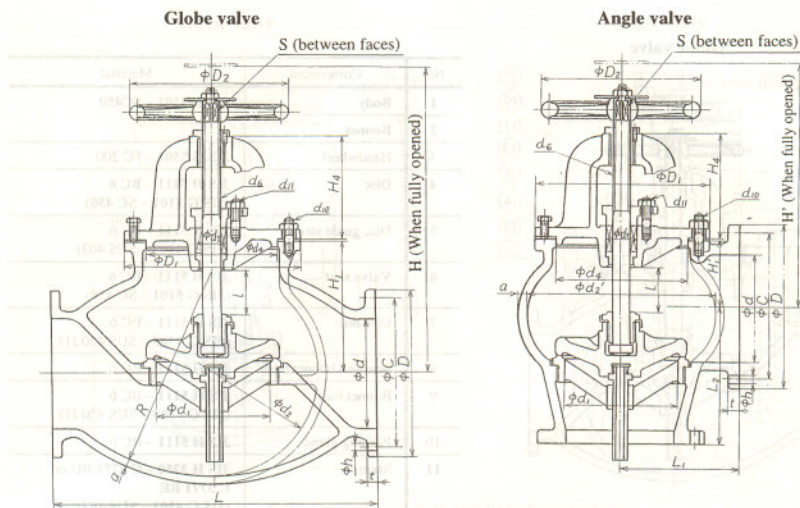
Note (°): For materials of body, which are not carbon steel, symbols of materials shall be entered after the hyphen following the nominal diameter.

Example: When the material of the body is molybdenum steel.

40K-32M

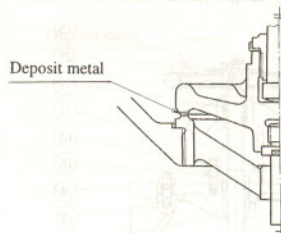
(°): When BC6 is used for the guide bush of a screw-down check globe valve and a screw-down check angle valve, "205°C" indicating the maximum working temperature shall also be shown.

(°): No arrowhead indicating the direction of flow is required for gate valves.



Bolt holes of flanges shall straddle body centre lines

When the materials of disk and valve seat are SC450



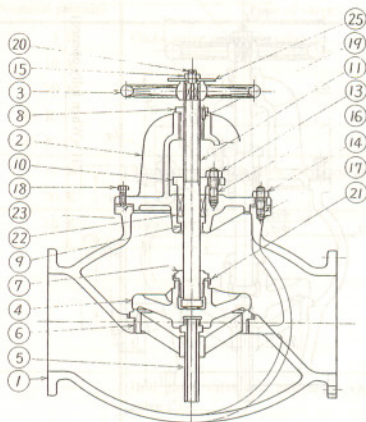
Unit: mm

Centrifugal Pump																															
Nominal dia.	d	d ₁	L	L ₁	L ₂	Flange						Height (approx.) (fully opened)	Lift	Handwheel	Body						Height of bonnet	Stem		Threads		Reference					
						D	Bolt hole		t						d ₁	a	R	H ₁	D ₁	d ₂		H ₁ '	S	Stuffing box	d ₁₀		d ₁₁	Calculated mass (kg)			
							P.C. dia. C	No.																					h	Nominal dia. of bolt	
H	H'	l	D ₁	d ₁	a	R	H ₁	D ₁	d ₂	H ₁ '	d ₂	H ₁	d ₂	H ₁ '	S	d ₁₀	d ₁₁	Calculated mass (kg)													
250	250	265	740	275	320	385	345	12	23	M20	22	795	138	365	460	17	460	305	390	300	280	Tr42 x 7 (TW42)	30	66	M20	M16	230				
												640						155										178			
300	300	315	840	310	370	430	390	12	23	M20	22	930	165	400	560	18	560	360	455	354	325	Tr46 x 8 (TW46)	32	72	M22	M20	302				
												750						180										275			

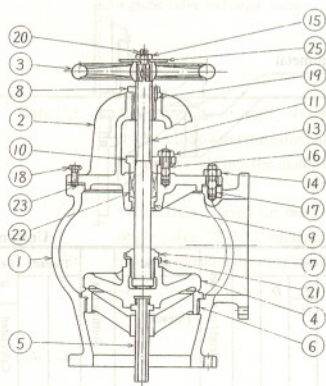
- Remarks:**
1. Flanges shall conform to JIS B 2210 for a nominal pressure 5K. However, when used as valves for fitting on ship's bottom and sides, flanges conforming to JIS B 2210, 10K may be used.
 2. Threads d_4 shall conform to JIS B 0216. These may conform to JIS B 0222, but this is not advisable for newly designed ones.
 3. Threads d_{10} and d_{11} shall conform to JIS B 0205.
 4. The upper data represent dimensions or calculated masses of globe valves, while the lower data represent those of angle valves.
 5. Dimensions L and R apply to globe valves. Dimensions L_1 and L_2 apply to angle valves.

Attached Fig. 1 Construction, shape and dimensions of 5K globe valve and angle valve

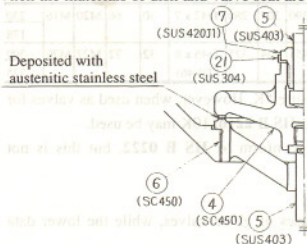
Globe valve



Angle valve



When the materials of disk and valve seat are SC450

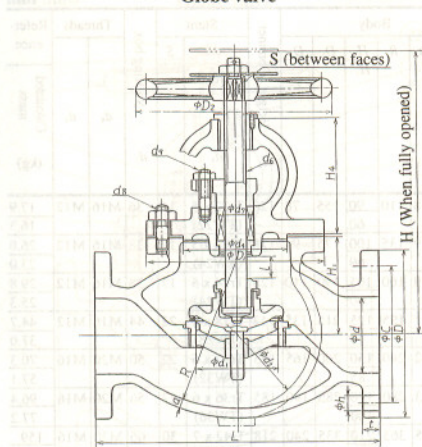


Attached Fig. 2 Materials of 5K globe valve and angle valve

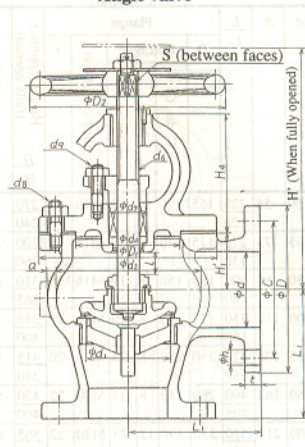
No.	Component	Material
1	Body	JIS G 5101 – SC450
2	Bonnet	
3	Handwheel	JIS G 5501 – FC 200
4	Disc	JIS H 5111 – BC 6 (JIS G 5101 – SC 450)
5	Disc guide stem	JIS H 5111 – BC 6 (JIS G 4303 – SUS 403)
6	Valve seat	JIS H 5111 – BC 6 (JIS G 5101 – SC 450)
7	Disc nut	JIS H 5111 – BC 6 (JIS G 4303 – SUS 420 J1)
8	Screwed bonnet bush	JIS H 5111 – BC 6
9	Bonnet bush	JIS H 5111 – BC 6 (JIS G 4303 – SUS 420 J1)
10	Packing gland	JIS H 5111 – BC 6
11	Stem	JIS H 3250 – C 3771 BD or C 3771 BE (JIS G 4303 – SUS 403)
13	Hexagonal nut	JIS H 3250 – C 3771 BD
14	Hexagonal nut	JIS G 3101 – SS 400 (JIS H 3250 – C 3771 BD)
15	Hexagonal nut	JIS H 3250 – C 3771 BD
16	Stud	JIS G 3101 – SS 400 (JIS H 3250 – C 3771 BD)
17	Stud	JIS G 3101 – SS 400
18	Tack bolt	JIS H 3250 – C 3771 BD
19	Lock pin	JIS G 3101 – SS 400
20	Split pin	JIS H 3260 – C 2600 W
21	Disk lock washer	JIS H 3100 – C 2600 P (JIS G 4305 – SUS 304)
22	Packing	JIS F 7102
23	Gasket	
25	Name plate	JIS H 3100 – C 2801 P

- Remarks:**
- Letters in boldface indicate materials specified in Attached Table 1.
 - Materials in parentheses may be used when specified by the purchaser. In this case, the contact surfaces of stainless steel shall be provided with appropriate differences of hardness by heat treatment or else so as to prevent seizure (this requirement does not apply to deposited austenitic stainless steel).
 - Instead of using split pin 20, hexagonal nut 15 may be substituted with a lock nut.
 - Name plates shall be furnished to the purchaser's instructions.

Globe valve



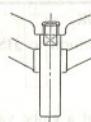
Angle valve



Bolt holes of flanges shall straddle body centre lines

For nominal dia. of 250 or more

When the materials of body and valve seat are SC480



Deposit metal



Attached Fig. 3 Construction, shape and dimensions of 10K globe valve and angle valve

Item	Material	Material	Material
1. Body	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
2. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
3. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
4. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
5. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
6. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
7. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
8. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
9. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
10. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
11. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
12. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
13. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
14. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
15. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
16. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
17. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
18. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
19. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
20. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
21. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
22. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
23. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
24. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
25. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
26. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
27. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
28. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
29. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
30. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
31. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
32. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
33. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
34. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
35. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
36. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
37. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
38. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
39. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
40. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
41. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
42. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
43. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
44. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
45. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
46. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
47. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
48. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
49. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
50. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
51. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
52. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
53. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
54. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
55. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
56. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
57. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
58. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
59. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
60. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
61. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
62. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
63. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
64. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
65. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
66. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
67. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
68. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
69. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
70. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
71. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
72. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
73. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
74. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
75. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
76. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
77. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
78. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
79. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
80. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
81. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
82. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
83. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
84. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
85. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
86. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
87. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
88. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
89. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
90. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
91. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
92. Valve seat	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
93. Valve stem	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
94. Handwheel	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
95. Flange	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
96. Bolt	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
97. Nut	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
98. Washer	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
99. Packing gland	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480
100. Packing	JIS G 5010 - SC 480	SC 480	JIS G 5010 - SC 480

Remarks:

1. Latent or the valve material, the materials specified in Attached Table 1.
2. The design of the valve seat shall be provided with an appropriate difference of hardness by heat treatment to prevent wear (including automatic cleaning device).
3. The material of the valve seat and the valve stem shall be equivalent to the material of valve seat 3 in. (except for the valve seat 3 in. or less, the material shall be austenitic stainless steel).
4. Based on working with the valve seat 3 in. or less, the material shall be austenitic stainless steel.
5. Based on working with the valve seat 3 in. or less, the material shall be austenitic stainless steel.

Attached Fig. 4 Materials of 10K globe valve and angle valve

Unit: mm

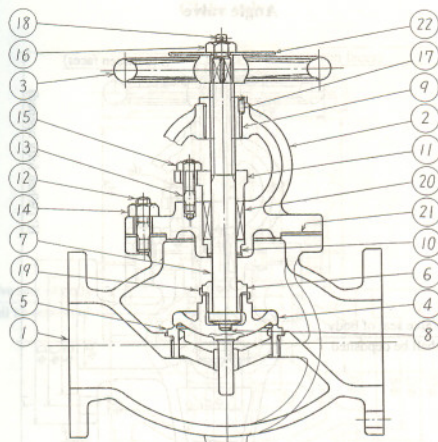
Nominal dia.	d	d_1	$\frac{L}{L_1}$	Flange						t	Height (approx.) (fully opened)	Lift	Handwheel	Body						Height of bonnet	Stem		Threads		Reference		
				D	Bolt hole		Nominal dia. of bolt	H H'	l					D_2	d_2 d_2'	a	R	H_1 H_1'	D_1		D_3	Threads	S	Stuffing box		d_4	d_5
50	50	58	220 120	155	120	4	19	M16	16	270 240	17	160	110 105	8	110	90 60	155	78	120	Tr22 x 5 (TW22)	14	36	M16	M12	17.9 16.3		
65	65	73	270 130	175	140	4	19	M16	18	300 260	22	200	135 130	9	135	100 60	175	95	128	Tr24 x 5 (TW24)	17	38	M16	M12	26.0 23.0		
80	80	88	300 140	185	150	8	19	M16	18	310 265	27	200	160 150	9	160	105 60	190	110	128	Tr24 x 5 (TW24)	17	38	M16	M12	29.8 25.3		
100	100	111	350 160	210	175	8	19	M16	18	355 300	33	250	195 185	11	195	125 70	215	135	142	Tr28 x 5 (TW28)	22	44	M16	M12	44.7 37.0		
125	125	138	420 180	250	210	8	23	M20	20	415 350	42	280	240 225	12	240	150 85	260	165	165	Tr32 x 6 (TW32)	22	50	M20	M16	70.3 57.1		
150	150	163	490 205	280	240	8	23	M20	22	470 400	50	315	280 265	13	280	170 100	285	190	185	Tr36 x 6 (TW36)	27	56	M20	M16	96.4 77.2		
200	200	213	570 230	330	290	12	23	M20	22	565 480	67	355	365 340	15	365	210 125	335	240	218	Tr42 x 7 (TW42)	30	66	M20	M16	159 116		
250	250	265	740 290	400	355	12	25	M22	24	645 535	83	400	470 430	16	470	259 150	405	300	225	Tr44 x 7 (TW44)	32	68	M22	M20	257 188		
300	300	315	840 320	445	400	16	25	M22	24	735 610	100	450	550 500	17	550	300 175	460	355	249	Tr48 x 8 (TW48)	36	74	M22	M20	370 256		

Remarks:

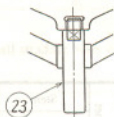
1. Flanges shall conform to JIS B 2210 of nominal pressure 10K.
2. Threads d_4 shall conform to JIS B 0216. These may conform to JIS B 0222, but this is not advisable for newly designed ones.
3. Threads d_4 and d_5 shall conform to JIS B 0205.
4. The upper data represent dimensions or calculated mass of a globe valve, while the lower data represent those of an angle valve.
5. The tabulated dimension R is applicable to globe valves only.

Attached Fig. 3 (Cont'd)

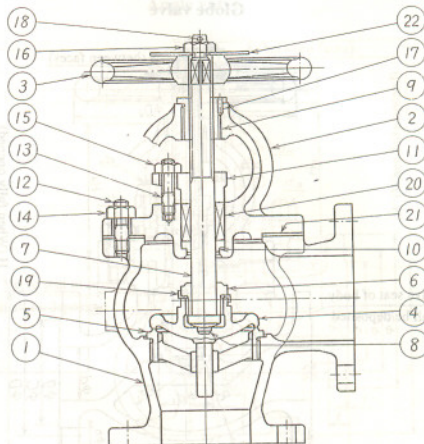
Globe valve



For nominal dia. of 250 or more

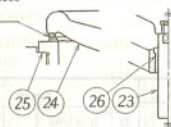


Angle valve



When the materials of body and valve seat are SC480

Deposited with stainless steel



No.	Component	Material	No.	Component	Material
1	Body	JIS G 5101 - SC 480	14	Hexagonal nut	JIS G 3101 - SS 400
2	Bonnet		15	Hexagonal nut	JIS H 3250 - C 3771 BD
3	Handwheel	JIS G 5501 - FC 200	16	Hexagonal nut	
4	Disc	JIS G 5121 - SCS 2	17	Lock pin	JIS G 3101 - SS 400
5	Valve seat		18	Split pin	JIS H 3260 - C 2600 W
6	Disc nut	JIS G 4303 - SUS 420 J1	19	Disk lock water	JIS G 4305 - SUS 304
7	Stem	JIS G 4303 - SUS 403	20	Packing	JIS F 7102
8	Washer for stem	JIS G 4404 - SKD 1	21	Gasket	
9	Screwed bonnet bush	JIS H 3250 - C 6782 BC	22	Name plate	JIS H 3100 - C 2801 P
10	Bonnet bush	JIS G 4303 - SUS 420 J1	23	Disc guide	JIS G 4303 - SUS 403
11	Packing gland	JIS G 5111 - BC 6	24	Disc	JIS G 5101 - SC 480
12	Stud	JIS G 3101 - SS 4900	25	Valve seat	
13	Stud	JIS G 3101 - SS 400	26	Guide bush	JIS G 4303 - SUS 420J1

Remarks: 1. Letters in boldface indicate the materials specified in Attached Table 1.

2. The contact surfaces of stainless steel shall be provided with an appropriate difference of hardness by heat treatment to prevent seizure (excluding austenitic stainless deposit)

3. The material deposited on the disc and the valve seat shall be equivalent to the material of valve seat 5 in performance. However, when the fluid is sea water, the material shall be austenitic stainless steel.

4. Instead of using split pin 18, hexagonal nut 16 may be substituted with a lock nut.

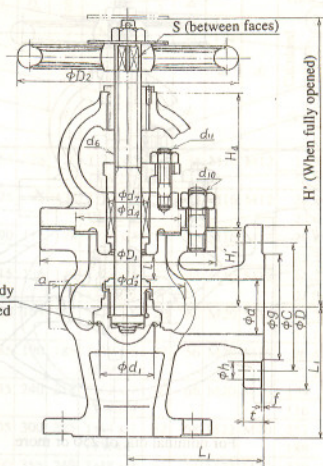
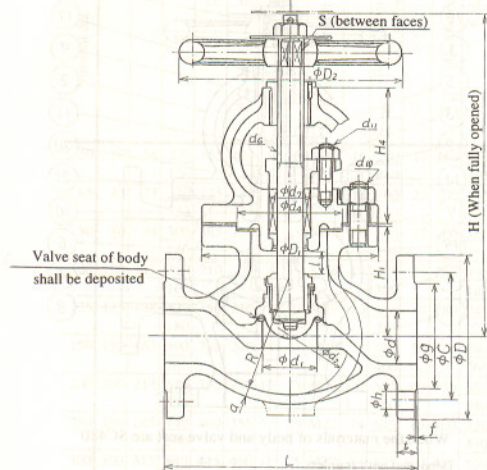
5. Name plates shall be furnished to the purchaser's instructions.

Attached Fig. 4 Materials of 10K globe valve and angle valve

Nominal dia.: 32 to 100

Globe valve

Angle valve



Bolt holes of flanges shall straddle body centre lines

Unit: mm

Unit: mm																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
Nominal dia.	d	d ₁	$\frac{L}{L_1}$	Flange										Height (approx.) (fully opened)	Lift	Handwheel	Body						Height of bonnet	Stem		Threads		Reference																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
				D	Bolt hole		t	f	g	d ₂	a	R	$\frac{H_1}{H_1'}$				D ₃	d ₄	Threads	S	d ₅	d ₆		Calculated mass (kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
					P.C. dia. C	No.																			Nominal dia. of bolt																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Remarks: 1. Flanges shall conform to JIS B 2210 for a nominal pressure 20K.

2. Threads d_6 shall conform to JIS B 0216. These may conform to JIS B 0222, but this is not advisable for newly designed ones.3. Threads d_{10} and d_{11} shall conform to JIS B 0205.

4. The upper data represent dimensions or calculated masses of globe valves, while the lower data represent those of angle valves.

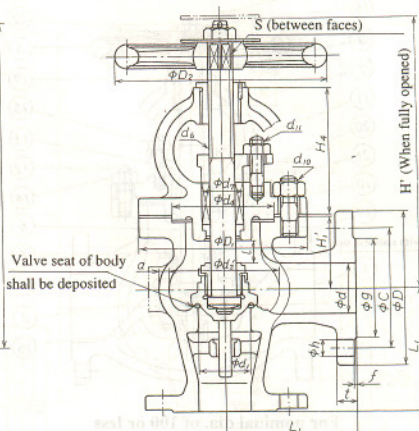
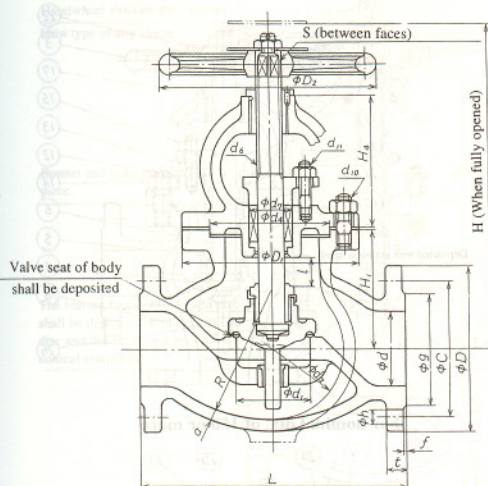
5. The tabulated dimension R is applicable to globe valves only.

Attached Fig. 5 Construction, shape and dimensions of 20K globe valve and angle valve

Nominal dia.: 125 to 250

Globe valve

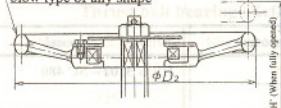
Angle valve



Bolt holes of flanges shall straddle body centre lines

For nominal dia. of 150 or more

The wheelhandle shall be of the hammer blow type of any shape



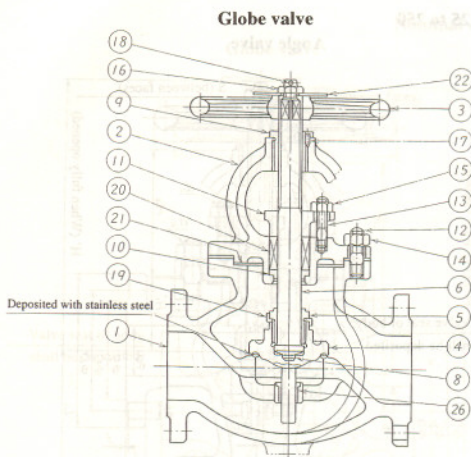
Unit: mm

Nominal dia.	d	d ₁	L L ₁	Flange								Height (approx.) (fully opened)	Lift	Handwheel	Body						Height of bonnet	Stem		Threads		Reference								
				D	Bolt hole		t	f	g	H H'	I				D ₂	d ₁	a	R	H ₁ H ₁ '	D ₃		d ₄	H ₂				d ₅	S	d ₆	d ₇	d ₁₀	d ₁₁	Calculated mass (kg)	
					P.C. dia. C No.	h																		Nominal dia. of bolt										
																									No.	h								Nominal dia. of bolt
125	125	125	430 200	270	225	8	25	M22	26	2	195	500 440	42	315	240 225	14	240	185 125	270	190	192	Tr38 x 7 (TW38)	27	60	M22	M16	95.7 80.7							
150	150	150	500 225	305	260	12	25	M22	28	2	230	550 485	50	355	280 265	16	280	205 140	295	215	212	Tr42 x 7 (TW42)	27	66	M22	M16	133.3 112.3							
200	200	200	560 280	350	305	12	25	M22	30	2	275	630 540	67	450	350 320	17	350	225 135	350	270	240	Tr50 x 8 (TW50)	—	78	M22	M20	296.1 183.0							
250	250	250	660 310	430	380	12	27	M24	34	2	345	725 620	83	560	430 400	19	430	265 160	405	320	267	Tr55 x 9 (TW58)	—	88	M24	M22	339.1 285.9							

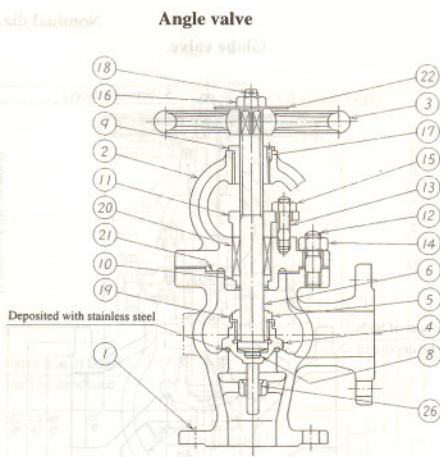
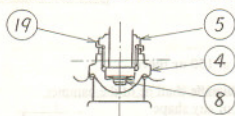
Remarks:

1. Flanges shall conform to JIS B 2210 for a nominal pressure 20K.
2. Threads d_3 shall conform to JIS B 0216. These may conform to JIS B 0222, but this is not advisable for newly designed ones.
3. Threads d_4 and d_1 shall conform to JIS B 0205.
4. The upper data represent dimensions or calculated masses of globe valves, while the lower data represent those of an angle valves.
5. The tabulated dimension of R applies only to globe valves.
6. The diameter of the stems of valves with a nominal diameter of 250 shall be 58 mm.

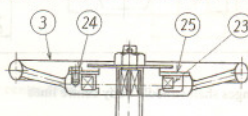
Attached Fig. 6 Construction, shape and dimensions of 20K globe valve and angle valve



For nominal dia. of 100 or less



For nominal dia. of 150 or more



No.	Component	Material	No.	Component	Material
1	Body	JIS G 5101 – SC 480	14	Hexagonal nut	JIS G 4051 – S 25 C
2	Bonnet		15	Hexagonal nut	JIS G 3101 – SS 400
3	Handwheel	Nominal dia. 125 JIS G 5501 – FC 200	16	Hexagonal nut	JIS H 3250 – C 3604 BD
		Nominal dia. 150 or more JIS G 5101 – SC 450 or JIS G 5502 – FCD 450	17	Lock pin	JIS G 3101 – SS 400
4	Disc	JIS G 4303 – SUS 420 J1 or SUS 420J2 or JIS G 5121 – SCS 2	18	Split pin	JIS H 3260 – C 2600 W
5	Disc nut	JIS G 4303 – SUS 420 J1	19	Disk lock washer	JIS G 4305 – SUS 304
6	Stem	JIS G 4303 – SUS 403	20	Packing	JIS F 7102
8	Washer for stem	JIS G 4404 – SKD 1	21	Gasket	
9	Screwed bonnet bush	JIS H 3250 – C 6782 BD	22	Name plate	JIS H 3100 – C 2801 P
10	Packing bush	JIS G 4303 – SUS 420 J1	23	Shock absorber	JIS G 4051 – S 35 C
11	Packing gland	JIS H 5111 – BC 6	24	Hexagonal bolt	JIS G 3101 – SS 400
12	Stud	JIS G 4051 – S 35 C	25	Handwheel cover	
13	Stud	JIS G 3101 – SS 490		Bush	JIS G 4303 – SUS 420 J1

Remarks:1. Letters in boldface indicate the materials specified in **Attached Table 1**.

2. The contact surfaces of stainless steel shall be provided with an appropriate difference of hardness by heat treatment to prevent seizure (excluding austenitic stainless deposit).

3. Material deposited on the disc and the valve seat shall be equivalent to the material of disc 4, in performance.

4. Instead of using split pin 18, hexagonal nut 16 may be substituted with a lock nut.

5. Name plates shall be furnished to the purchaser's instructions.

Attached Fig. 7 Materials of 20K globe valve and angle valve**Documents**

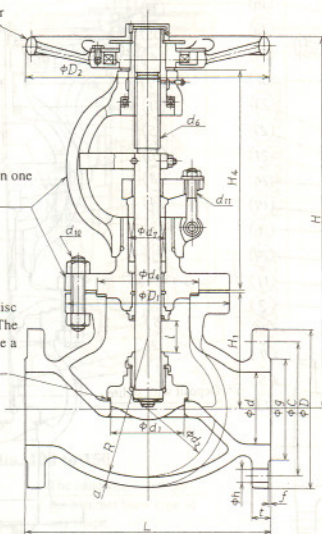
Document Sharing Hub

Globe valve

Handwheel shall be the hammer
blow type of any shape.

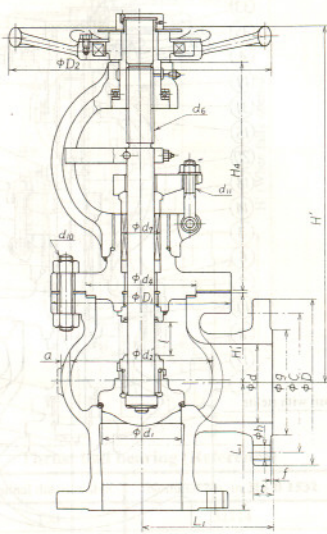
Bonnet and yoke may be built in one piece.

The seating faces of body and disc shall be deposited with stellite. The disc and the valve seat may have a conical seating face.



Bolt holes of flanges shall straddle body centre lines

Angle valve



Thrust ball bearing (Reference)

Nominal dia. of valve	Nominal No. in JIS B 1532
100	5113
125	5114
150	5116

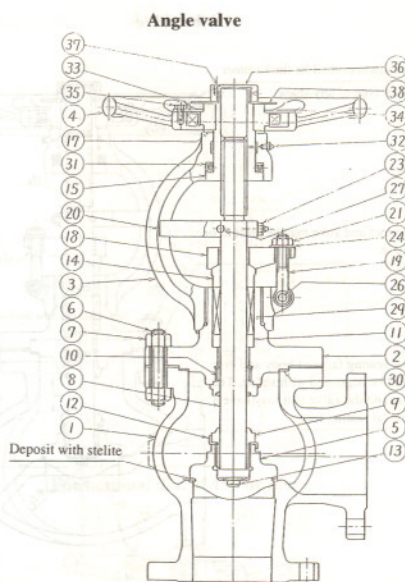
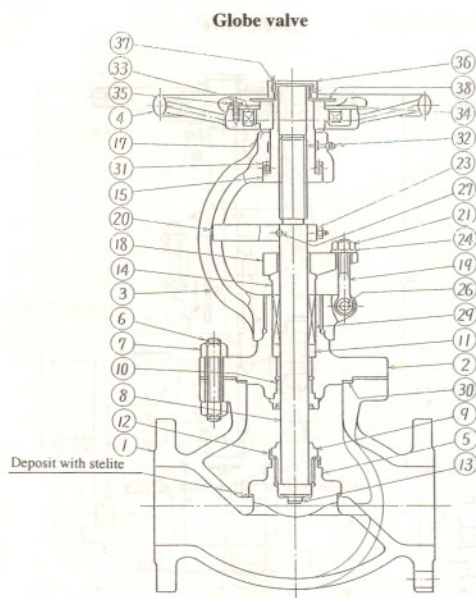
Unit: mm

Nominal dia	<i>d</i>	<i>d_i</i>	$\frac{L}{L_s}$	Flange							Reference	Lift	Handwheel	Body						Stem Threads	Threads		Reference			
				<i>D</i>	Bolt hole		<i>h</i>	<i>t</i>	<i>f</i>	<i>g</i>				$\frac{d_i}{d_i}$	<i>a</i>	<i>R</i>	Reference	Reference	Reference		Ht of bonnet Reference	Threads		Stuffing box	<i>d_n</i>	<i>d_i</i>
P.C. dia. C	No.	Nominal dia. of bolt	$\frac{H}{H'}$	<i>l</i>	<i>D₁</i>	$\frac{H}{H'}$	<i>D₁</i>	<i>d_s</i>	<i>H_s</i>	<i>d_s</i>	(kg)															
100	100	100	$\frac{410}{205}$	240	195	8	25	M22	32	2	160	$\frac{575}{630}$	48	355	$\frac{200}{190}$	16	200	$\frac{175}{130}$	260	150	345	Tr36 x 6 (TW 36)	56	M22	M20	$\frac{115}{106}$
125	125	125	$\frac{460}{230}$	275	230	8	25	M22	36	2	195	$\frac{570}{615}$	58	400	$\frac{245}{230}$	17	245	$\frac{205}{150}$	290	180	403	Tr42 x 7 (TW 42)	66	M22	M20	$\frac{168}{154}$
150	150	150	$\frac{500}{250}$	325	275	12	27	M24	38	2	235	$\frac{755}{690}$	68	500	$\frac{280}{270}$	19	280	$\frac{235}{170}$	335	205	450	Tr48 x 8 (TW 48)	88	M24	M20	$\frac{242}{222}$

Remarks:

1. Flanges shall conform to **JIS B 2210** for a nominal pressure 30K.
2. Threads d_2 shall conform to **JIS B 0216**. These may conform to **JIS B 0222**, but this is not advisable for newly designed ones.
3. Threads d_{10} and d_{11} shall conform to **JIS B 0205**.
4. The upper data represent dimensions or calculated masses of globe valves, while the lower data represent those of an angle valves.
5. The tabulated dimension R is applicable to globe valves only.
6. Grease nipples shall conform to **JIS B 1575**.

Attached Fig. 8 Construction, shape and dimensions of 30K globe valve and angle valve



No.	Component	Material		No.	Component	Material	
		For bodies of carbon steel castings	For bodies of molybdenum steel castings			For bodies of carbon steel castings	For bodies of molybdenum steel castings
1	Body	JIS G 5101 – SC 480	JIS G 5151 – SCPH 11	17	Washer	JIS H 5111 – BC 6	
2	Bonnet			18	Packing gland	JIS G 4051 – S 35 C	
3	Yoke	JIS G 5101 – SC 480		19	Hinge bolt		
4	Handwheel	JIS G 5101 – SC 450		20	Stopper for stem	JIS G 4051 – S 25 C	
5	Disc	JIS G 5101 – SC 480 or JIS G 4303 – SUS 420 J1	JIS G 5151 – SCPH 11 or JIS G 4105 – SCM 415	21	Hexagonal nut	JIS G 3101 – SS 400	
6	Bolt	JIS G 4105 – SCM 435		23	Hexagonal nut		
7	Hexagonal nut	JIS G 4051 – S 45 C		24	Washer		
8	Stem	JIS G 4303 – SUS 403		26	Pin	JIS G 4051 – S 35 C	
9	Disc nut	JIS G 4303 – SUS 420 J1	JIS G 4303 – SUS 420 J1 or monel metal	27	Taper pin		
10	Back seat ring			29	Packing	JIS F 7102	
11	Seat ring			30	Gasket		
12	Disc lock washer	JIS G 4305 – SUS 304		31	Thrust ball bearing	–	
13	Washer for stem	JIS G 4404 – SKD 1		32	Grease nipple	–	
14	Packing gland ring	JIS G 4303 – SUS 420 J1		33	Pounding receiver	JIS G 4051 – S35C	
15	Screwed bush	JIS H 3250 – C 6782 BD		33–37	Handwheel cover	JIS G 3101 – SS 400	
				38	Name plate	JIS H 3100 – C 2801 P	

- Remarks:**
1. The contact surfaces of stainless steel shall be provided with an appropriate difference of hardness by heat treatment to prevent seizure (excluding austenitic stainless deposit).
 2. Materials of JIS G 4051-S25C, S35C and S45C shall be subjected to the proper heat treatment.
 3. Name plates shall be furnished in accordance with the purchaser's instructions.

Attached Fig. 9 Materials of 30K globe valve and angle valve