

Shipbuilding – Cast iron valves

1. Scope This Japanese Industrial Standard specifies marine cast iron 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 2210 – Basic dimensions of ferrous material pipe flanges
- JIS F 7102 – Shipbuilding – Piping system in machinery space – Application for gaskets and packing
- JIS F 7335 – Shipbuilding – Hose connections and fittings
- JIS F 7400 – Shipbuilding – Valves and cocks – General inspection requirement
- JIS G 3101 – Rolled steel for general structure
- 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 5501 – Grey iron castings
- JIS G 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 5111 – Bronze castings

2. Classification Cast iron 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 the fluid condition of a cast iron valve and maximum working pressure shall be as given in **Attached Tables 2 through 6**.

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

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

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

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

- (1) The particulars given in **Attached Table 8** shall be marked on the surface of the body of cast iron valve.
- (2) A screw-down check globe valve and a screw-down check angle valve shall have cross-recessed grooves, which are painted black, at the heads of valve stems to indicate that they are check valves.

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

Type	Nominal pressure	Nominal diameter									Type symbol of marine valve	Materials	Test pressure MPa			Construction, shape and dimensions				
		50	65	80	100	125	150	200	250	300			350	400	450	500	550	Watertightness inspection of valve seat		Hydraulic inspection of body
Globe valve and angle valve	5 K	○	○	○	○	○	○	○	○	○	○	○			The materials of body, bonnet and main components (disc, valve seat and stem) shall be as shown in boldface in Attached Figs. 4 and 6 . Materials are divided into Class B and Class S according to the combination of materials. For valves with a nominal diameter of 250 or more, only materials in Class B shall be used.	Nominal dia. of 300 or less	0.76	1.03	Attached Figs. 1 and 5	The permissible dimensional deviation of thickness <i>a</i> of body shall be +15/-10%. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be up to 1 mm. The wheelhandle of a valve with a nominal diameter of 450 or more may have a gear arrangement.
														Nominal diameter of 350 and 400	0.65	0.88				
	10 K	Globe valve	○	○	○	○	○	○	○	○	○	○		FGF	The materials of body, bonnet and main components (disc, valve seat and stem) shall be as shown in boldface in Attached Figs. 4 and 8 . Materials are divided into Class B and Class S according to the combination of materials. For valves with a nominal diameter of 250 or more in Class S, the materials of disc and valve seat may be SC450. In this case, the valve seat surfaces shall be deposited with stainless steel.	Nominal dia. 200 or less	1.51	2.06	Attached Figs. 2 and 7	
		Angle valve	○	○	○	○	○	○	○	○	○	○		FLF		Nominal dia. 250 or more	1.08	1.47		
		16 K	○	○	○	○	○	○	○	○	○	○	○			The materials of body, bonnet and main components (disc, valve seat and stem) shall be as shown in boldface in Attached Fig. 4 . Materials are divided into Class B and Class S according to the combination of materials.		2.38	3.24	
Screw-down check globe valve and angle valve	5 K	Globe valve	○	○	○	○	○	○	○	○	○	○		FGFN	The materials of body, bonnet and main components (disc, valve seat and stem) shall be as shown in boldface in Attached Figs. 12 and 14 . Materials are divided into Class B and Class S according to the combination of materials. For valves with a nominal diameter of 250 or more, only materials in Class B shall be used.	Nominal dia.	From below body	From above body	Attached Figs. 9 and 13	
		Angle valve	○	○	○	○	○	○	○	○	○	○		FLFN			300 or less	0.76		Reducing from 0.76 or 0.39
															350 and 400	0.65	Reducing from 0.65 or 0.29	0.88		
															450 or more	0.54	Reducing from 0.54 or 0.20	0.74		
		10 K		○	○	○	○	○	○	○	○	○	○			The materials of body, bonnet and main components (disc, valve seat and stem) shall be as shown in boldface in Attached Fig. 12 . Materials are divided into Class B and Class S according to the combination of materials.	1.51 from below body		2.06	Attached Fig. 10
															Reducing from 1.51 to 0.39 from above body					
	16 K		○	○	○	○	○	○	○	○	○	○			The materials of body, bonnet and main components (disc, valve seat and stem) shall be as shown in boldface in Attached Fig. 12 . Materials are divided into Class B and Class S according to the combination of materials.	2.37 from below body		3.24	Attached Fig. 11	
															Reducing from 2.37 to 0.39 from above body					
Lift check globe valve and angle valve	5 K	Globe valve	○	○	○	○	○	○	○	○	○	○		FGFLN	The materials of body, bonnet, disc and valve seat shall be as shown in boldface in Attached Fig. 15 .	Reducing from 0.76 to 0.39 from above body.		1.03	Attached Fig. 15	
		Angle valve	○	○	○	○	○	○	○	○	○	○		FLFLN						
Swing check valve	5 K		○	○	○	○	○	○	○	○	○	○		FGFSN	The materials of body, bonnet, disc, valve seat, arm and pin shall be as shown in boldface in Attached Fig. 17 .	Reducing from 0.76 to 0.39 at the outlet side.		1.03	Attached Fig. 16	The permissible dimensional deviation of thickness <i>a</i> of body and thickness <i>a</i> ₁ of bonnet shall be +15/-10%. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be up to 1 mm. The valve seat of a valve with a working temperature of 70°C or less may be a baked rubber seat if the purchaser so instructs.
		10 K		○	○	○	○	○	○	○	○	○				The materials of body, bonnet, disc, valve seat, arm and pin shall be as shown in boldface in Attached Fig. 17 .	Reducing from 1.51 to 0.39 from the outlet side.			
Gate valve	5 K		○	○	○	○	○	○	○	○	○	○		FSF	The materials of body, bonnet and main components (disc, valve seat, and stem) and screw block shall be as shown in boldface in Attached Figs. 20 and 23 . Materials are divided into Class B and Class S according to the combination of materials.	Nominal dia. 400 or less	0.76	1.03	Attached Figs. 18 and 21	The permissible dimensional deviation of thickness <i>a</i> of body and bonnet <i>a</i> ₁ shall be +15/-10%. 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 may be provided with suitable ribs as necessary. The opening/closing mechanism of valves with a nominal diameter of 450 to 600 may be such that thrust ball bearings are omitted for modifying it into the direct wheelhandle-operated type if the working pressure is 0.2 MPa or less and the purchaser so designates.
																Nominal dia. 450 to 600	0.54	0.74		
																However, the watertightness inspection of valves with a nominal diameter of 300 or more may be modified to a pressure designated by the purchaser, which is below those shown above.				
		10 K		○	○	○	○	○	○	○	○	○	○				The materials of body, bonnet and main components (disc, valve seat, and stem) and screw block shall be as shown in boldface in Attached Figs. 20 and 23 . Materials are divided into Class B and Class S according to the combination of materials.	Nominal dia. 400 or less	1.51	
															Nominal dia. 450 to 600	1.29	1.77			
																However, the watertightness inspection of valves with a nominal diameter of 300 or more may be modified to a pressure designated by the purchaser, which is below those shown above.				
	16 K											○	○			The materials shall, as a rule, be as shown in Attached Fig. 20 . Materials are divided into Class B and Class S according to the combination of materials.	Shall be 1.73. However, the watertightness inspection of valves may be to a pressure designated by the purchaser, which is below those shown above.		2.36	Attached Fig. 19
Globe hose valve and angle hose valve	5 K		○	○	○	○	○	○	○	○	○	○		FGFH	The materials of body, bonnet and main components (disc, valve seat, and stem) and base connection shall be as shown in boldface in Attached Fig. 25 .	0.76		1.03	Attached Fig. 24	The permissible dimensional deviation of thicknesses <i>a</i> of body shall be +15/-10%. However, if the calculated permissible dimensional deviation is less than 1 mm, the deviation may be up to 1 mm.
		10 K		○	○	○	○	○	○	○	○	○		FLFH	The materials of body, bonnet and main components (disc, valve seat, and stem) and base connection shall be as shown in boldface in Attached Fig. 25 .	1.51		2.06		

Remarks:

1. Nominal diameter columns marked ○ show that they are covered by this Standard.

2. The hydraulic test of hose base connections shall be carried out at the following test pressures applicable to hose fittings.

With the hose base connections coupled to the valve body, it may be carried out concurrently at the test pressure for body.

3. 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.

4. Class B in the tables shows that copper alloy metals are used for main components (body, valve seat, stem), while Class S shows that stainless steels are used for these main components.

5. The external surfaces of flange may be left black or machined.

Test pressure for hose fittings

Nominal pressure	Test pressure MPa
5 K	0.69
10 K	1.37

Attached Table 2 Globe valve and angle valve

Fluid condition	Maximum working pressure MPa									
	Nominal pressure									
	5 K			10 K			16 K			
	Nominal dia.									
	200 or less	250, 300	350, 400	200 or less	250 or more	200 or less				
	Class									
	B	S	B		B	S	B	S	B	S
Steam at 230°C or less	—	0.49	—		—	0.98	—		—	1.57
Steam at 205°C or less	0.49				0.98				1.57	
Saturated steam							0.49			
Air and gas		0.49	—				—		1.57	
Oil and shock water			0.49				0.98			
Non-shock water of 120°C or less		0.69	0.59		1.37				2.16	

Remark: See Attached Table 1 (Material) for Class B and S.

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

Fluid condition	Maximum working pressure MPa									
	Nominal pressure									
	5 K					10 K		16 K		
	Nominal dia.									
	200 or less	250, 300	350, 400	450 or more	200 or less	150 or less				
	Class									
	B	S	B			B	S	B	S	
Steam at 230°C or less	—	0.49	—	—	—	—	0.98	—	1.57	
Steam at 205°C or less	0.49					0.98		1.57		
Air and gas		0.49				0.98		1.57		
Oil and shock water			0.49		0.39					
Non-shock water of 120°C or less		0.69	0.59		0.49	1.37		2.16		

Remark: See Attached Table 1 (Material) for Class B and S.

Attached Table 4 Swing check valve, lift check globe valve and angle valve

Fluid condition	Maximum working pressure MPa			
	Type of valve			
	Swing check valve	Lift check globe valve	Lift check angel valve	
	Nominal pressure			
	5 K	10 K	5 K	
	Nominal dia.			
	250 or less	200 or less	150 or less	200 or less
Oil and shock water	0.49	0.98	0.49	
Non-shock water of 120°C or less	0.69	1.37	0.69	

Remark: The working temperature of swing check valves shall be 70°C or less, if a rubber valve seat is used.

Attached Table 5 Gate valve

Fluid condition	Maximum working pressure MPa							
	Nominal pressure							
	5 K			10 K			16 K	
	Nominal dia.							
	200 or less	250 ~ 400	450 or more	200 or less	250 ~ 400	450 or more	300 ~ 400	
Saturated steam	0.29	0.20		0.49	0.29		—	
Oil and shock water	0.49			0.98			1.57	
Non-shock water of 120°C or less	0.69		0.49	1.37		1.18	—	

Attached Table 6 Globe valve and angle hose valve

Fluid condition	Maximum working pressure MPa	
	Nominal pressure	
	5 K	10 K
	Nominal dia.	
Shock water	50	50, 65
	0.49	0.98
Non-shock water of 120°C or less	0.69	1.37

Notes: (a) A swing check valve using a rubber valve seat shall be stamped with the letter "R" on the peripheral surface of the cover.

(b) No interrelated test along the direction of flow is required for gate valves.

Attached Table 7 Designation and abbreviation of products

Designation	Abbreviation
Marine cast iron 5K -50 globe valve B	FGB550B
Marine cast iron 5K -50 angle valve S	FLF550S
Marine cast iron 5K -50 screw-down check globe valve B	FGFN550B
Marine cast iron 5K -50 screw-down check angle valve B	FLFN550B
Marine cast iron 5K -50 lift check globe valve B	FGFLN550
Marine cast iron 5K -50 lift check angle valve B	FLFLN550
Marine cast iron 5K -50 swing check valve	FGPSN550
Marine cast iron 5K -50 gate valve B	FSF550B
Marine cast iron 5K -450 gate valve S (with thrust ball bearing)	FSF5450ST
Marine cast iron 5K -50 globe hose valve	FGFH550
Marine cast iron 5K -50 angle hose valve	FLFH550

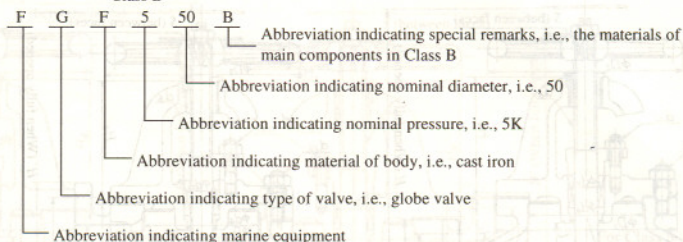
Remarks: 1. Designation of abbreviations shall be as shown below:

①	②	③	④	⑤	⑥	⑦
① Abbreviation indicating marine equipment F: Marine equipment						
② Abbreviation to indicate type G: Glove valve (including swing valve) L: Gate valve					L: Angle valve	
③ Abbreviation to indicate materials of valve body (cage) F: Cast iron						
④ Abbreviation to indicate application or shape N: Screw-down check valve SN: Swing check valve					LN: Lift check valve H: Flanged hose valve	
⑤ Abbreviation to indicate nominal pressure 5: Nominal pressure of 5K 10: Nominal pressure of 10K 16: Nominal pressure of 16K						
⑥ Abbreviation to indicate nominal diameter Examples: 50: Nominal diameter of 50 200: Nominal diameter of 200						
⑦ Abbreviation to indicate special remarks ◎ Materials of main components B: Class B S: Class S ◎ Others T: Fitted with thrust ball bearing						

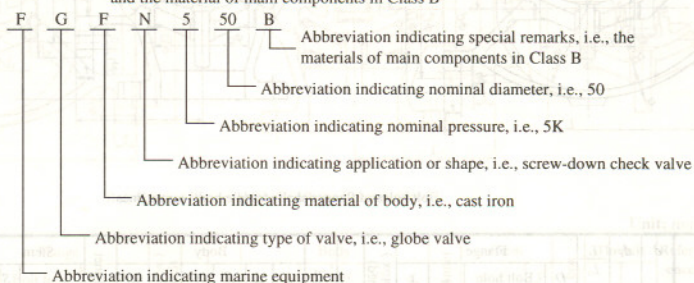
Note (1): The number of symbol s shows the number of designated items, but when the number is small, or some are missing, the designation shall be made by shifting the rest leftward.

2. Examples of designation using abbreviations

Example 1. Marine cast iron 5K globe valve with a nominal diameter of 50 and the material in Class B



Example 2. Marine cast iron 5K screw-down check globe valve with a nominal diameter of 50 and the material of main components in Class B



Attached Table 8 Designation items

Nominal pressure	Type of valve	Designation items
5 K	Globe valve and angle valve	(1) Nominal pressure and diameter
10 K		(2) Arrowhead indicating the flow direction
16 K		(3) Name of manufacturer or abbreviated tradename
5 K	Screw-down check globe valve and angle valve	(4) Year and month of manufacturer
10 K		
16 K		
5 K	Lift check globe valve and angle valve	
5 K	Swing check valve (°)	
10 K		
5 K	Globe valve and angle hose valve	
10 K		
5 K	Gate valve (°)	(1) Nominal pressure and nominal diameter
10 K		(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.)
16 K		(3) Name of manufacturer or abbreviated tradename
		(4) Year and month of manufacturer

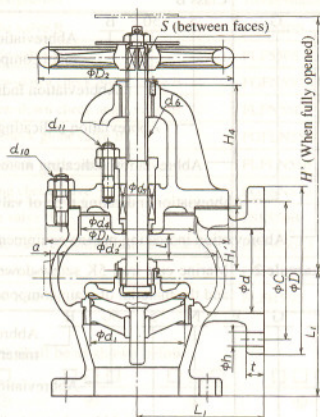
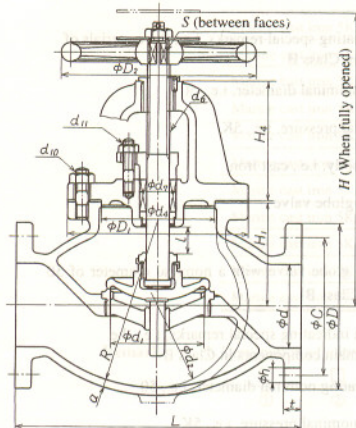
Note (°): A swing check valve using a rubber valve seat shall be stamped with the letter R on the peripheral surface of the cover.

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

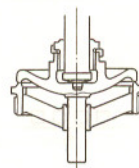
Nominal dia.: 50 to 200

Globe valve

Angle valve



For Class S



Bolt holes of flanges shall straddle body centre lines

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		Refer- ence
				D	Bolt hole		Nominal dia. of bolt	P.C. dia. C	No.	h	$\frac{d_2}{d_1}$	a	R					$\frac{H_1}{H_1'}$	D ₂	d ₁	S	Threads	Stuffing box		d _m	d ₁₁			
H H'	l	D ₁	H ₁	d ₁	H ₁	d ₁	d ₁	d ₁	d ₁	d ₁	d ₁	d ₁	d ₁	d ₁	d ₁	d ₁	d ₁	(kg)											
50	50	58	$\frac{210}{100}$	130	105	4	15	M12	16	$\frac{270}{240}$	17	160	$\frac{110}{105}$	8	110	$\frac{90}{60}$	140	78	120	Tr20 x 4 (TW20)	14	32	M12	M12	$\frac{14.7}{12.9}$				
65	65	73	$\frac{250}{115}$	155	130	4	15	M12	18	$\frac{300}{255}$	22	180	$\frac{135}{130}$	9	135	$\frac{105}{62}$	160	95	128	Tr22 x 5 (TW22)	14	36	M12	M12	$\frac{21.3}{18.2}$				
80	80	88	$\frac{280}{130}$	180	145	4	19	M16	18	$\frac{310}{265}$	27	180	$\frac{160}{150}$	9	160	$\frac{110}{65}$	190	110	128	Tr22 x 5 (TW22)	14	36	M16	M12	$\frac{27.7}{23.4}$				
100	100	111	$\frac{340}{150}$	200	165	8	19	M16	20	$\frac{360}{310}$	33	224	$\frac{195}{185}$	10	195	$\frac{125}{75}$	215	135	148	Tr26 x 5 (TW26)	19	42	M16	M12	$\frac{40.8}{33.7}$				
125	125	138	$\frac{410}{170}$	235	200	8	19	M16	20	$\frac{390}{330}$	42	250	$\frac{240}{225}$	11	240	$\frac{145}{85}$	245	165	148	Tr28 x 5 (TW28)	22	44	M16	M12	$\frac{57.6}{46.2}$				
150	150	163	$\frac{480}{190}$	265	230	8	19	M16	22	$\frac{445}{380}$	50	280	$\frac{280}{265}$	12	280	$\frac{165}{100}$	270	190	168	Tr32 x 6 (TW32)	22	50	M16	M16	$\frac{80.3}{63.4}$				
200	200	213	$\frac{570}{220}$	320	280	8	23	M20	24	$\frac{530}{450}$	67	315	$\frac{365}{340}$	15	365	$\frac{210}{130}$	335	240	185	Tr36 x 6 (TW36)	27	56	M20	M16	$\frac{139}{105}$				

Remarks: 1. Flanges shall conform to JIS B 2210 of nominal pressure 5 K.

2. Threads d_s 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 mass of globe valve, while the power data represent those of the angle valve.

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

6. The calculated masses are of values of material in Class B.

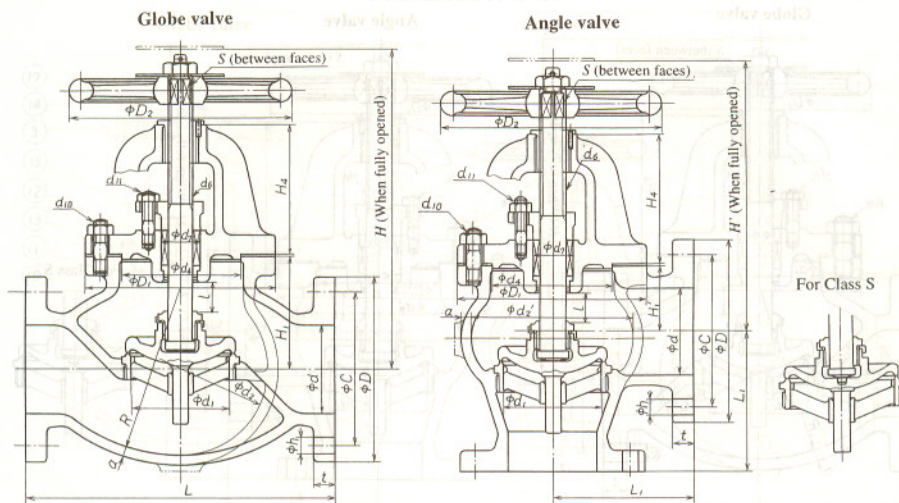
Attached Fig. 1 Construction, shape and dimensions of 5 K globe valve and angle valve



Documents

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Nominal dia.: 50 to 200



Bolt holes of flanges shall straddle body centre lines

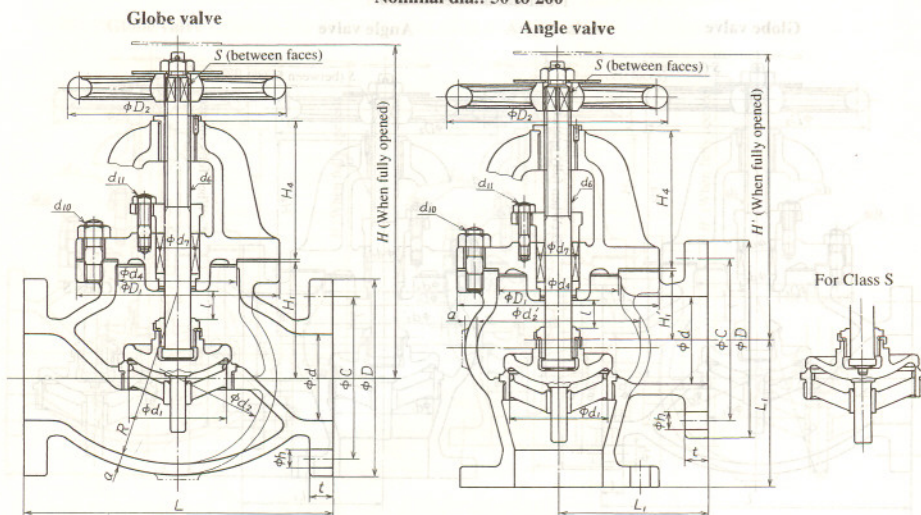
Unit: mm

Nominal dia.	d	d ₁	L L ₁	Flange							Height (approx.) (fully opened)	Lift	Handwheel	Body						Height of bonnet	Stem		Stuffing box		Threads		Refer- ence																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
				D	Bolt hole		Nominal dia. of bolt	t	d ₂	a				R	H ₁ H ₁ '	D ₂	d ₃	Threads	S		d _m	d _{i1}	Calculated mass (kg)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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₅₁₇	d ₅₁₈	d ₅₁₉	d ₅₂₀	d ₅₂₁	d ₅₂₂	d ₅₂₃	d ₅₂₄	d ₅₂₅	d ₅₂₆	d ₅₂₇	d ₅₂₈	d ₅₂₉	d ₅₃₀	d ₅₃₁	d ₅₃₂	d ₅₃₃	d ₅₃₄	d ₅₃₅	d ₅₃₆	d ₅₃₇	d ₅₃₈	d ₅₃₉	d ₅₄₀	d ₅₄₁	d ₅₄₂	d ₅₄₃	d ₅₄₄	d ₅₄₅	d ₅₄₆	d ₅₄₇	d ₅₄₈	d ₅₄₉	d ₅₅₀	d ₅₅₁	d ₅₅₂	d ₅₅₃	d ₅₅₄	d ₅₅₅	d ₅₅₆	d ₅₅₇	d ₅₅₈	d ₅₅₉	d ₅₆₀	d ₅₆₁	d ₅₆₂	d ₅₆₃	d ₅₆₄	d ₅₆₅	d ₅₆₆	d ₅₆₇	d ₅₆₈	d ₅₆₉	d ₅₇₀	d ₅₇₁	d ₅₇₂	d ₅₇₃	d ₅₇₄	d ₅₇₅	d ₅₇₆	d ₅₇₇	d ₅₇₈	d ₅₇₉	d ₅₈₀	d ₅₈₁	d ₅₈₂	d ₅₈₃	d ₅₈₄	d ₅₈₅	d ₅₈₆	d ₅₈₇	d ₅₈₈	d ₅₈₉	d ₅₉₀	d ₅₉₁	d ₅₉₂	d ₅₉₃	d ₅₉₄	d ₅₉₅	d ₅₉₆	d ₅₉₇	d ₅₉₈	d ₅₉₉	d ₆₀₀	d ₆₀₁	d ₆₀₂	d ₆₀₃	d ₆₀₄	d ₆₀₅	d ₆₀₆	d ₆₀₇	d ₆₀₈	d ₆₀₉	d ₆₁₀	d ₆₁₁	d ₆₁₂	d ₆₁₃	d ₆₁₄	d ₆₁₅	d ₆₁₆	d ₆₁₇	d ₆₁₈	d ₆₁₉	d ₆₂₀	d ₆₂₁	d ₆₂₂	d ₆₂₃	d ₆₂₄	d ₆₂₅	d ₆₂₆	d ₆₂₇	d ₆₂₈	d ₆₂₉	d ₆₃₀	d ₆₃₁	d ₆₃₂	d ₆₃₃	d ₆₃₄	d ₆₃₅	d ₆₃₆	d ₆₃₇	d ₆₃₈	d ₆₃₉	d ₆₄₀	d ₆₄₁	d ₆₄₂	d ₆₄₃	d ₆₄₄	d ₆₄₅	d ₆₄₆	d ₆₄₇	d ₆₄₈	d ₆₄₉	d ₆₅₀	d ₆₅₁	d ₆₅₂	d ₆₅₃	d ₆₅₄	d ₆₅₅	d ₆₅₆	d ₆₅₇	d ₆₅₈	d ₆₅₉	d ₆₆₀	d ₆₆₁	d ₆₆₂	d ₆₆₃	d ₆₆₄	d ₆₆₅	d ₆₆₆	d ₆₆₇	d ₆₆₈	d ₆₆₉	d ₆₇₀	d ₆₇₁	d ₆₇₂	d ₆₇₃	d ₆₇₄	d ₆₇₅	d ₆₇₆	d ₆₇₇	d ₆₇₈	d ₆₇₉	d ₆₈₀	d ₆₈₁	d ₆₈₂	d ₆₈₃	d ₆₈₄	d ₆₈₅	d ₆₈₆	d ₆₈₇	d ₆₈₈	d ₆₈₉	d ₆₉₀	d ₆₉₁	d ₆₉₂	d ₆₉₃	d ₆₉₄	d ₆₉₅	d ₆₉₆	d ₆₉₇	d ₆₉₈	d ₆₉₉	d ₇₀₀	d ₇₀₁	d ₇₀₂	d ₇₀₃	d ₇₀₄	d ₇₀₅	d ₇₀₆	d ₇₀₇	d ₇₀₈	d ₇₀₉	d ₇₁₀	d ₇₁₁	d ₇₁₂	d ₇₁₃	d ₇₁₄	d ₇₁₅	d ₇₁₆	d ₇₁₇	d ₇₁₈	d ₇₁₉	d ₇₂₀	d ₇₂₁	d ₇₂₂	d ₇₂₃	d ₇₂₄	d ₇₂₅	d ₇₂₆	d ₇₂₇	d ₇₂₈	d ₇₂₉	d ₇₃₀	d ₇₃₁	d ₇₃₂	d ₇₃₃	d ₇₃₄	d ₇₃₅	d ₇₃₆	d ₇₃₇	d ₇₃₈	d ₇₃₉	d ₇₄₀	d ₇₄₁	d ₇₄₂	d ₇₄₃	d ₇₄₄	d ₇₄₅	d ₇₄₆	d ₇₄₇	d ₇₄₈	d ₇₄₉	d ₇₅₀	d ₇₅₁	d ₇₅₂	d ₇₅₃	d ₇₅₄	d ₇₅₅	d ₇₅₆	d ₇₅₇	d ₇₅₈	d ₇₅₉	d ₇₆₀	d ₇₆₁	d ₇₆₂	d ₇₆₃	d ₇₆₄	d ₇₆₅	d ₇₆₆	d ₇₆₇	d ₇₆₈	d ₇₆₉	d ₇₇₀	d ₇₇₁	d ₇₇₂	d ₇₇₃	d ₇₇₄	d ₇₇₅	d ₇₇₆	d ₇₇₇	d ₇₇₈	d ₇₇₉	d ₇₈₀	d ₇₈₁	d ₇₈₂	d ₇₈₃	d ₇₈₄	d ₇₈₅	d ₇₈₆	d ₇₈₇	d ₇₈₈	d ₇₈₉	d ₇₉₀	d ₇₉₁	d ₇₉₂	d ₇₉₃	d ₇₉₄	d ₇₉₅	d ₇₉₆	d ₇₉₇	d ₇₉₈	d ₇₉₉	d ₈₀₀	d ₈₀₁	d ₈₀₂	d ₈₀₃	d ₈₀₄	d ₈₀₅	d ₈₀₆	d ₈₀₇	d ₈₀₈	d ₈₀₉	d ₈₁₀	d ₈₁₁	d ₈₁₂	d ₈₁₃	d ₈₁₄	d ₈₁₅	d ₈₁₆	d ₈₁₇	d ₈₁₈	d ₈₁₉	d ₈₂₀	d ₈₂₁	d ₈₂₂	d ₈₂₃	d ₈₂₄	d ₈₂₅	d ₈₂₆	d ₈₂₇	d ₈₂₈	d ₈₂₉	d ₈₃₀	d ₈₃₁	d ₈₃₂	d ₈₃₃	d ₈₃₄	d ₈₃₅	d ₈₃₆	d ₈₃₇	d ₈₃₈	d ₈₃₉	d ₈₄₀	d ₈₄₁	d ₈₄₂	d ₈₄₃	d ₈₄₄	d ₈₄₅	d ₈₄₆	d ₈₄₇	d ₈₄₈	d ₈₄₉	d ₈₅₀	d ₈₅₁	d ₈₅₂	d ₈₅₃	d ₈₅₄	d ₈₅₅	d ₈₅₆	d ₈₅₇	d ₈₅₈	d ₈₅₉	d ₈₆₀	d ₈₆₁	d ₈₆₂	d ₈₆₃	d ₈₆₄	d ₈₆₅	d ₈₆₆	d ₈₆₇	d ₈₆₈	d ₈₆₉	d ₈₇₀	d ₈₇₁	d ₈₇₂	d ₈₇₃	d ₈₇₄	d ₈₇₅	d ₈₇₆	d ₈₇₇	d ₈₇₈	d ₈₇₉	d ₈₈₀	d ₈₈₁	d ₈₈₂	d ₈₈₃	d ₈₈₄	d ₈₈₅	d ₈₈₆	d ₈₈₇	d ₈₈₈	d ₈₈₉	d ₈₉₀	d ₈₉₁	d ₈₉₂	d ₈₉₃	d ₈₉₄	d ₈₉₅	d ₈₉₆	d ₈₉₇	d ₈₉₈	d ₈₉₉	d ₉₀₀	d ₉₀₁	d ₉₀₂	d ₉₀₃	d ₉₀₄	d ₉₀₅	d ₉₀₆	d ₉₀₇	d ₉₀₈	d ₉₀₉	d ₉₁₀	d ₉₁₁	d ₉₁₂	d ₉₁₃	d ₉₁₄	d ₉₁₅	d ₉₁₆	d ₉₁₇	d ₉₁₈	d ₉₁₉	d ₉₂₀	d ₉₂₁	d ₉₂₂	d ₉₂₃	d ₉₂₄	d ₉₂₅	d ₉₂₆	d ₉₂₇	d ₉₂₈	d ₉₂

- Remarks:**
1. Flanges shall conform to **JIS B 2210** of nominal pressure 10 K.
 2. Threads d_8 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 mass of globe valve, while the power data represent those of the angle valve.
 5. The tabulated dimension R is applicable to globe valves only.
 6. The calculated masses are of values of material in Class B.

Attached Fig. 2 Construction, shape and dimensions of 10 K globe valve and angle valve

Nominal dia.: 50 to 200



Bolt holes of flanges shall straddle body centre lines

Unit: mm																												
Nominal dia.	d	d ₁	$\frac{L}{L_1}$	Flange								Body										Height of bonnet H_1	Stem		Stuffing box	Threads		Refer- ence
				D	Bolt hole		Nominal dia. of bolt	t	Height (approx.) (fully opened) $\frac{H}{H'}$	Lift l	Handwheel D ₂	$\frac{d_2}{d_1}$	a	R	$\frac{H_1}{H_2}$	D ₂	d ₃	Threads	S	d _m	d ₁₁		Calculated mass (kg)					
50	50	58	$\frac{220}{120}$	155	120	8	19	M16	20	$\frac{285}{255}$	17	160	$\frac{110}{105}$	10	110	$\frac{95}{65}$	155	78	130	Tr22 x 5 (TW22)	14	36	M16	M12	19.6 18.0			
65	65	73	$\frac{270}{130}$	175	140	8	19	M16	22	$\frac{310}{270}$	22	200	$\frac{135}{135}$	11	135	$\frac{105}{62}$	175	95	135	Tr24 x 5 (TW24)	17	38	M16	M12	28.3 25.0			
80	80	88	$\frac{300}{140}$	200	160	8	19	M20	24	$\frac{340}{295}$	27	224	$\frac{160}{150}$	12	160	$\frac{115}{70}$	205	110	148	Tr26 x 5 (TW26)	19	42	M20	M12	40.4 35.7			
100	100	111	$\frac{350}{170}$	225	185	8	19	M20	26	$\frac{385}{330}$	33	250	$\frac{195}{185}$	13	195	$\frac{135}{80}$	230	135	160	Tr30 x 5 (TW30)	22	48	M20	M12	56.9 49.2			
125	125	138	$\frac{430}{200}$	270	225	8	23	M22	26	$\frac{455}{390}$	42	315	$\frac{240}{225}$	15	240	$\frac{160}{95}$	270	165	185	Tr36 x 6 (TW36)	27	56	M22	M16	89.5 76.1			
150	150	163	$\frac{500}{225}$	305	260	12	23	M22	28	$\frac{510}{435}$	50	355	$\frac{280}{265}$	16	280	$\frac{185}{110}$	295	190	205	Tr42 x 7 (TW42)	30	66	M22	M16	123 103			
200	200	213	$\frac{570}{250}$	350	305	12	23	M22	30	$\frac{630}{540}$	67	450	$\frac{365}{340}$	19	365	$\frac{225}{140}$	350	240	230	Tr48 x 8 (TW48)	36	74	M22	M20	188 155			

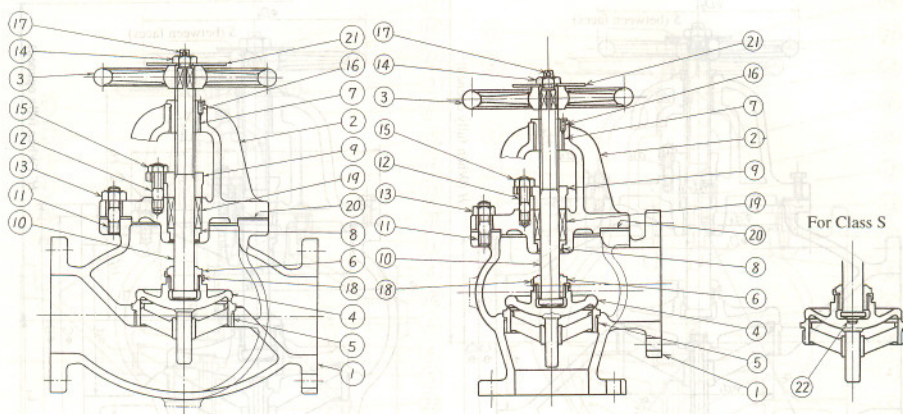
- Remarks:**
1. Flanges shall conform to **JIS B 2210** of nominal pressure 16 K.
 2. Threads d_6 shall conform to **JIS B 0216**. These may conform to **JIS B 0222**, but this is not advisable for newly designed ones.
 3. Threads d_{10} and d_{11} shall conform to **JIS B 0205**.
 4. The upper data represent dimensions or calculated mass of globe valve, while the power data represent those of the angle valve.
 5. The tabulated dimension R is applicable to globe valves only.
 6. The calculated masses are of values of material in Class B.

Attached Fig. 3 Construction, shape and dimensions of 16 K globe valve and angle valve

Nominal dia.: 50 to 200

Globe valve

Angle valve



No.	Component	Material		No.	Component	Material	
		Class B	Class S			Class B	Class S
1	Body	JIS G 5501 – FC 200		12	Stud	JIS H 3250 – C 3771 BD	
2	Bonnet	JIS G 5501 – FC 200		13	Hexagonal nut	JIS G 3101 – SS 400	
3	Handwheel	JIS G 5501 – FC 200		14	Hexagonal nut	JIS H 3250 – C 3604 BD	
4	Disc	JIS G 5111 – BC 6	JIS G 5121 – SCS 2	15	Hexagonal nut	JIS G 3101 – SS 400	
5	Valve seat	JIS G 5111 – BC 6	JIS G 4303 – SUS 420 J2	16	Lock pin	JIS H 3260 – C 2600 W	
6	Disc nut	JIS G 5111 – BC 6	JIS G 4303 – SUS 420 J2	17	Split pin	JIS H 3100 – C 2600 P	
7	Screwed bonnet bush	JIS G 5111 – BC 6		18	Disk lock water	JIS H 3100 – C 2600 P	JIS G 4305 – SUS 304
8	Seat ring	JIS G 5111 – BC 6	JIS G 4303 – SUS 420 J2	19	Packing	JIS F 7102	
9	Packing gland	JIS G 5111 – BC 6		20	Gasket	JIS H 3100 – C 2801 P	
10	Stem	JIS H 3250 – C 3771 BD or C 3771 BE	JIS G 4303 – SUS 403	21	Name plate	JIS H 3100 – C 2801 P	
11	Stud	JIS G 3101 – SS 400		22	Washer for stem		JIS G 4404 – SKD 1

Remarks:

1. Letters in boldface show materials specified in Attached Table I.

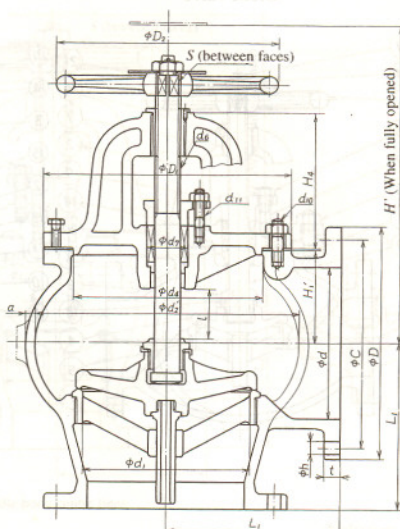
2. The contact surfaces of stainless steel shall be provided with the appropriate differences in hardness by heat treatment to prevent seizure.

3. Instead of using split pin 17, hexagonal nut 14 may be substituted with a lock nut.

4. Name plates shall be furnished in accordance with the purchaser's instructions.

Attached Fig. 4 Materials of 5 K, 10 K, 16 K globe valve and angle valve

Angle valve



Bolt holes of flanges shall straddle body centre lines

Nominal dia.	<i>d</i>	<i>d_i</i>	$\frac{L}{L_u}$	Flange										Body										Stem		Threads		Refer- ence
				<i>D</i>	Bolt hole		Nominal dia. of bolt	<i>t</i>	Height (approx.) (fully opened)	Lift	Handwheel						Height of bonnet	Threads	<i>S</i>	Stuffing box	Threads							
					P.C. dia. <i>C</i>	<i>h</i>						$\frac{d_1}{d_2}$	<i>a</i>	<i>R</i>	$\frac{H_1}{H_2}$	<i>D₂</i>					<i>d₃</i>	<i>d₄</i>	<i>d₆</i>	<i>d₇</i>	<i>d₁₀</i>	<i>d₁₁</i>		
																											Calculated mass (kg)	
250	250	265	$\frac{740}{275}$	385	345	12	23	M20	26	$\frac{650}{540}$	84	355	$\frac{460}{420}$	16	460	$\frac{265}{155}$	395	300	225	Tr42 x 7 (TW42)	30	66	M20	M16	$\frac{246}{176}$			
300	300	315	$\frac{840}{310}$	430	390	12	23	M20	28	$\frac{740}{610}$	100	400	$\frac{560}{510}$	17	560	$\frac{310}{180}$	455	352	255	Tr46 x 8 (TW46)	32	72	M22	M20	$\frac{277}{343}$			
350	335	350	$\frac{940}{360}$	480	435	12	25	M22	30	$\frac{840}{690}$	112	500	$\frac{610}{560}$	18	610	$\frac{355}{200}$	515	400	290	Tr52 x 8 (TW52)	36	80	M22	M20	$\frac{462}{335}$			
400	380	403	$\frac{1050}{395}$	540	495	16	25	M22	30	$\frac{940}{770}$	127	560	$\frac{690}{630}$	20	690	$\frac{400}{225}$	570	454	315	Tr55 x 9 (TW58)	41	88	M22	M22	$\frac{647}{459}$			

Remarks:

1. Flanges shall conform to **JIS B 2210** of nominal pressure 5 K.
2. Threads d_s 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.
6. The diameter of the stem of a valve with a nominal diameter of 400 shall be 58 mm.

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