

Shipbuilding—Bronze valves

1. Scope This Japanese Industrial Standard specifies bronze valves used for steam, fresh water, sea water, oil and, and air piping systems, etc. of ships.

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 2240 General rules for copper alloy 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 4051 Carbon steels for machine structural use
- JIS G 5501 Grey 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 5111 Bronze castings

2. Classification Bronze 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 conditions of bronze valves and maximum working pressures shall be as given in **Attached Tables 2** through **7**.

4. Construction, shape and dimensions Construction, shape and dimensions of bronze valves shall be as given in **Attached Table 1**.

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

6. Tests and inspection Bronze valves shall be inspected for 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 Water leakage tests for valve seats of bronze valves shall be carried out at the test pressures given in **Attached Table 1**. However, bronze valves with a nominal diameter of 50 or less may be subjected to air leakage tests instead of water leakage tests.
 - (b) Hydraulic inspection for body However, bronze valves with a nominal diameter of 50 or less may be subjected to air leakage tests instead of hydraulic inspection for body.
When carrying out this inspection, the manufacturer shall autonomously carry out batch tests at the prescribed test pressures for each type, nominal size and service pressure in advance, and retain test records.

7. Designation Bronze valves shall be designated by title, nominal pressure, nominal dia, type, material symbol or abbreviation. Designations and abbreviations of bronze valves shall be as given in **Attached Table 8**.

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

- (1) The particulars given in **Attached Table 9** shall be marked on the surface of the body of a bronze valve.
- (2) A screw-down check globe valve and 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.

Attached Table 1 Type, nominal pressure, nominal diameter, type symbol, material, test pressure, construction, shape and dimensions of bronze valves

Type	Nominal pressure	Nominal diameter									Remarks	Type symbol of marine valve	Material	Test pressure		Construction, shape and dimensions		
		6	10	15	20	25	32	40	50	65				Water-tightness inspection of valve seat	Hydraulic inspection of body	Reference Fig. No.	Others	
Globe valve and angle valve	5 K			○	○	○	○	○	○	○		FGB FLB	The materials of body, bonnet, disc, valve seat and stem shall be as shown in Attached Figs. 3 and 4.	0.76	1.03	Attached Figs. 1 and 2	The permissible dimensional deviation of thickness of the body shall, in principle, be +15/-10%. However, if the calculated permissible dimensional deviation is less than 0.5 mm, the deviation may be up to 0.5 mm.	
	16 K			○	○	○	○	○				The materials of body, bonnet, disc, valve seat and stem shall be as shown in Attached Fig. 6.	2.37	3.24	Attached Fig. 5			
	20 K	○	○	Globe valves of screw-in type (S type) with union, screw-in with bite union; Union type (U type) with union, bite union Angle valves of screw-in type (S type) with union, screw-in with bite Note that nipples for union are for copper pipes and steel pipes.							FGB-CSU, SSU -CSB -CUU, SSU -CUB FLB-CSU, SSU -CSB	The materials of body, bonnet, bonnet nut and stem shall be as shown in Attached Fig. 8.	3.02	4.12	Attached Fig. 7	The permissible dimensional deviation of thickness of the body shall, in principle, be ±5 mm. Note that joints using copper pipes may be bite unions.		
Screw-down check globe valves and angle valves	5 K			○	○	○	○	○				FGBN FLBN	The materials of body, bonnet, disc, and stem shall be as shown in Attached Fig. 10.	The test pressure of 0.76 MPa shall be applied from below the disc.	The test pressure from above the disc of 0.76 MPa shall be reduced to 0.39 MPa.	1.03	Attached Fig. 9	The permissible dimensional deviation of thickness of the body shall, in principle, be +15/-10%. However, if the calculated permissible dimensional deviation is less than 0.5 mm, the deviation may be up to 0.5mm.
	16 K			○	○	○	○	○				The materials of body, bonnet, disc, and stem shall be as shown in Attached Fig. 12.	The test pressure of 2.37 MPa shall be applied from below the disc.	The test pressure from above the disc of 2.37 MPa shall be reduced to 0.39 MPa.	3.24	Attached Fig. 11		
Lift check globe valves	5 K					○	○	○				FGBLN	The materials of body, bonnet, and disc shall be as shown in Attached Fig. 13.	The test pressure shall be reduced from 0.76 MPa to 0.39 MPa.		1.03	Attached Fig. 13	
Globe valves (union bonnet type) and angle valves	5 K			○	○	○	○	○				FGBU FLBU	The materials of body, bonnet, bonnet nut, disc, and stem shall be as shown in Attached Fig. 15.	0.76		1.03	Attached Fig. 14	
	16 K			○	○	○	○	○					The materials of body, bonnet, bonnet nut, disc, and stem shall be as shown in Attached Fig. 17.	2.37		3.24	Attached Fig. 16	
Screwed-down globe valves (union bonnet type) and angle valves	5 K			○	○	○	○	○				FGBNU FLBNU	The materials of body, bonnet, bonnet nut, disc, and stem shall be as shown in Attached Fig. 19.	The test pressure of 0.76 MPa shall be applied from below the disc.	The test pressure from above the disc of 0.76 MPa shall be reduced to 0.39 MPa.	1.03	Attached Fig. 18	
	16 K			○	○	○	○	○					The materials of body, bonnet, bonnet nut, disc, and stem shall be as shown in Attached Fig. 21.	The test pressure of 2.37 MPa shall be applied from below the disc.	The test pressure from above the disc of 2.37 MPa shall be reduced to 0.39 MPa.	3.24	Attached Fig. 20	
Lift check globe valves (union bonnet type) and angle valves	5 K			○	○	○	○	○				FGBLNU FLBLNU	The materials of body, disc guide, cover nut, disc, and stem shall be as shown in Attached Fig. 23.	The test pressure of 0.76 MPa shall be reduced to 0.39 MPa.		1.03	Attached Fig. 22	
	16 K			○	○	○	○	○					The materials of body, disc guide, cover nut, and disc shall be as shown in Attached Fig. 25.	The test pressure of 2.37 MPa shall be reduced to 0.39 MPa.		3.24	Attached Fig. 24	
Swing check valves	5 K				○	○	○	○				FGBSN	The materials of body, bonnet, disc, and pin shall be as shown in Attached Figs. 26.	The test pressure of 0.76 MPa shall be reduced to 0.39 MPa.		1.03	Attached Figs. 26	
Hose globe valves and angle valves	5 K			○	○	○	○	○			○ shows screw-down type.	FGBH FLBH (FGBHS) (FLBHSH)	The materials of body, bonnet, disc and stem shall be as shown in Attached Figs. 27-32.	0.76	1.03	Attached Figs. 27-32		
	10 K			○	○	○	○	○						1.51	2.06			
Hull globe valves and angle valves	-			○	○	○	○	○				FGBHF FLBHF	The materials of body, bonnet, disc, and stem shall be as shown in Attached Fig. 34.	1.73	2.35	Attached Fig. 33		
Rising stem type gate valves	5 K			○	○	○	○	○				FSBJ	The materials of body, bonnet, bonnet nut, disc, and stem shall be as shown in Attached Fig. 36.	0.76	1.03	Attached Fig. 35		
	10 K			○	○	○	○	○					The materials of body, bonnet, bonnet nut, disc, and stem shall be as shown in Attached Fig. 38.	1.51	2.06	Attached Fig. 37		

- Remarks:**
- The entries in the column for nominal dia. marked ○ or ◎ shows that they are prescribed in this standard.
 - The hydraulic test for the upstream joint of a hose valve shall be carried out at the test pressures given in the table at right regarding it as a hose fitting. The test may be carried out concurrently with the hydraulic test of the body with the upstream joint fitted to the body.

Test pressures for hose fittings

Nominal pressure	Test pressure MPa
5 K	0.67
10 K	1.37

- Air-leakage tests of valve seats When valves with a nominal diameter of 50 or less are subjected to air leakage tests for valve seats instead of water leakage tests, the test air pressure shall be 0.59 MPa.
- Water-leakage tests of body When valves with a nominal diameter of 50 or less are subjected to air leakage tests for body instead of water leakage tests, the test air pressure shall be 0.59 MPa. They shall pass the autonomous batch tests for each type, nominal diameter, and pressure carried out at the respective test pressures with records retained.
- The outside diameters of flanges may be based upon either the machine-finished surface or the mill scale surface.

Attached Table 2 Globe valves and angle valves • screw-down check globe valves and angle valves • union bonnet type globe valves and angle valves • screw-down check globe valves (union bonnet type) and angle valves (union bonnet type)

Fluid condition	Maximum working pressure MPa		
	Nominal pressure		
	5 K	16 K	20 K
Steam at 205°C or less	0.49	1.57	1.57
Air, gas, oil and pulsating water			1.96
Non-shock water at 120°C or less	0.69	2.16	2.75

Attached Table 3 Lift check globe valve and swing check valve

Fluid condition	Maximum working pressure MPa	
	Nominal pressure	
	5 K	
Oil and pulsating water	0.49	
Non-shock water at 120°C or less	0.69	

Attached Table 4 Lift check globe valve (union bonnet type) and angle valve (union bonnet type)

Fluid condition	Maximum working pressure MPa	
	Nominal pressure	
	5 K	16 K
Air, gas and pulsating water	0.49	1.57
Non-shock water at 120°C or less	0.69	2.16

Attached Table 5 Hose globe valve and angle valve

Fluid condition	Maximum working pressure MPa					
	Nominal pressure					
	5 K			16 K		
	Nominal dia.					
	15	25	40, 50	15	25	40, 50, 65
Steam at 205°C or less	0.49	—	—	0.98	—	—
Air		0.49			0.98	
Pulsating water			0.49			
Non-shock water at 120°C or less		0.69			1.37	

Attached Table 6 Hull globe valve and angle valve

Fluid condition	Maximum working pressure MPa
Sea water and bilge water, compressed air and saturated steam	1.57

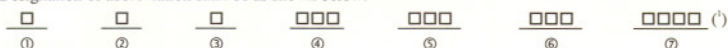
Attached Table 7 Rising stem type gate valve

Fluid condition	Maximum working pressure MPa	
	Nominal pressure	
	5 K	10 K
Oil and pulsating water	0.49	0.98
Saturated steam	0.20	0.20
Non-shock water at 120°C or less	0.69	1.37

Attached Table 8 Designations and abbreviations of products

Designation	Abbreviation
Bronze 5K-15 globe valves for marine use	FGB515
Bronze 16K-25 angle valves for marine use	FLB1625
Bronze 20K-6 globe valves (U shape union) for marine use	FGBSUU206
Bronze 20K-10 angle valves (Bite type) for marine use	FLBCSB2010
Bronze 5K-15 screw-down check globe valves for marine use	FGBN515
Bronze 16K-25 screw-down check angle valves for marine use	FLBN1625
Bronze 5K-40 lift check globe valves for marine use	FGBLN540
Bronze 5K-15 globe valves (union bonnet type) for marine use	FGBU515
Bronze 16K-40 angle valves (union bonnet type) for marine use	FLBU1640
Bronze 5K-15 screw-down check globe valves (union bonnet type) for marine use	FGBNU515
Bronze 16K-40 screw-down check angle valves (union bonnet type) for marine use	FLBNU1640
Bronze 5K-15 lift check globe valves (union bonnet type) for marine use	FGBLNU515
Bronze 16K-40 lift check angle valves (union bonnet type) for marine use	FLBLNU1640
Bronze 5K-25 swing check valves for marine use	FGBSN525
Bronze 5K-15 hose globe valves for marine use	FGBH515
Bronze 10K-65 hose angle valves for marine use	FLBH1065
Bronze 10K-15 screwed-down hose globe valves for marine use	FGBHS1015
Bronze 15 hull globe valves for marine use	FGBHF015
Bronze 40 hull globe valves for marine use	FLBHF040
Bronze 5K-15 rising stem type gate valves for marine use	FSBJ515

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



- ① Abbreviation indicating marine equipment
F: Marine equipment
- ② Abbreviation indicating type
G: Glove valve (including swing valve) L: Angle valve
S: Gate valve
- ③ Abbreviation indicating materials of body
B: Bronze
- ④ Abbreviation indicating application or shape
N: Screw-down check (valve) LN: Lift check (valve)
U: Union bonnet type
NU: Screw-down check (valve) (union bonnet type)
LNU: Lift check (valve) (union bonnet type)
SN: Swing check (valve) H: Flanged hose (valve)
HS: Screwed-down hose (valve) HF: Hull (valve)
J: Rising stem type (valve)
CSU: Screw-in (S type) with copper pipe union
SSU: Screw-in (S type) with steel pipe union
CUU: Union (U type) with copper pipe union
SUU: Union (U type) with steel pipe union
CUB: Union (U type) and copper pipe with bite (copper pipe)
CSB: Union (U type) and steel pipe with bite (steel pipe)
- ⑤ Abbreviation indicating nominal pressure
5: Nominal pressure of 5K 10: Nominal pressure of 10K
16: Nominal pressure of 16K 20: Nominal pressure of 20K

- ⑥ Abbreviation indicating nominal diameter

Examples: 6: Nominal diameter of 6 15: Nominal diameter of 15

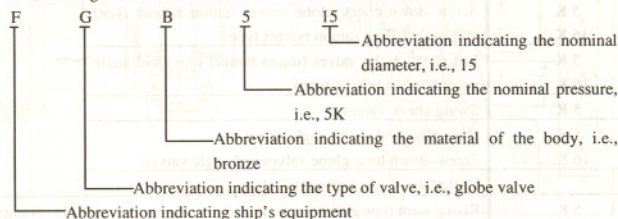
- ⑦ Abbreviation indicating special remarks

⑧ Others Only when using copper pipes with a nominal pressure of 20K and nominal diameter of 6, outside diameter of $\phi 8$ or $\phi 10$ shall be expressly shown.

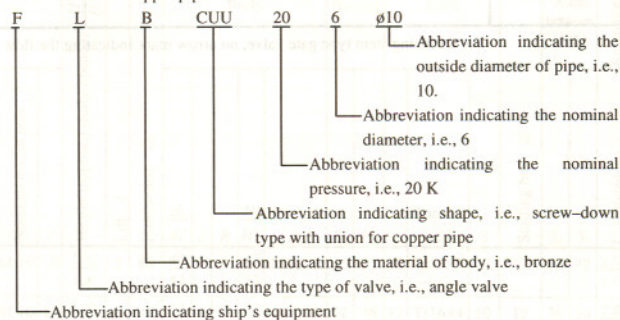
Note ('): The number of symbol □ is the number of designated items, but when the number is small, or some are missing, designation shall be made by shifting the remaining numbers leftwards.

2. Examples of designations using abbreviations

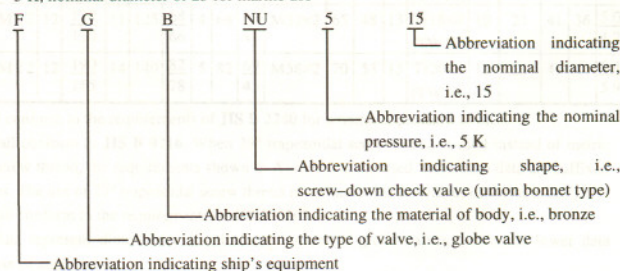
Example 1. Bronze 5K globe valve with a nominal diameter of 15 for marine use



Example 2. Bronze angle valve with a nominal pressure of 20 K, nominal diameter of 6, type U with a union for copper pipe for marine use



Example 3: Bronze screw-down check globe valve (union bonnet type) with a nominal pressure of 5 K, nominal diameter of 25 for marine use



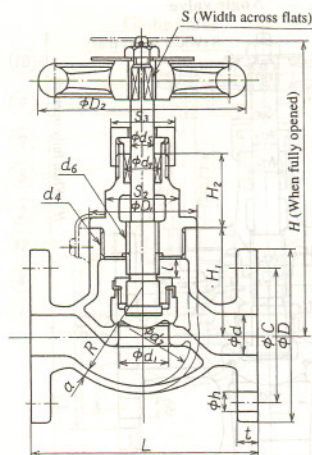
Attached Table 9 Designation items

Nominal pressure	Type of valve	Designation items
5 K 16 K 20 K	Globe valve and angle valve	(1) Nominal pressure and diameter (2) Arrowhead indicating the flow direction
5 K 16 K	Screw-down check globe valves and angle valves	(3) Name of manufacturer or abbreviated trade name
5 K	Lift check globe valves	(4) Year and month of manufacture
5 K 16 K	Check globe valves (union bonnet type) and angle valves (union bonnet type)	
5 K 16 K	Screw-down check globe valves (union bonnet type) and angle valves (union bonnet type)	
5 K 16 K	Lift check globe valves (union bonnet type) and angle valves (union bonnet type)	
5 K	Swing check valves	
5 K 16 K	Hose globe valve and angle valve	
	Screw-down hose globe valves and angle valves	
	Hull globe valves and angle valves	
5 K 10 K	Rising stem type gate valves (2)	(1) Nominal pressure and nominal diameter (2) Manufacturer's name or trade name (3) Year and month of manufacture

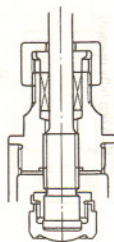
Note (2): For the rising stem type gate valve, no arrow mark indicating the flow direction is provided.

For nominal dia. 15-40

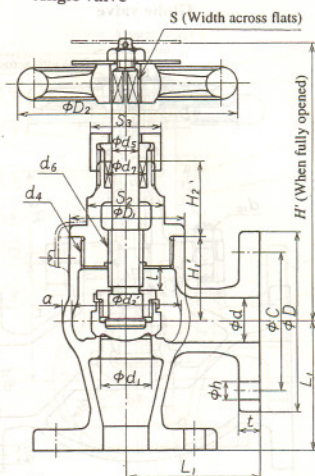
Globe valve



For bonnet with seat ring



Angle valve



Bolt holes of flanges shall straddle body centre lines

Unit: mm

Nominal dia.	Flange										$\frac{H}{H'}$	$\frac{H}{H'}$	Body						Bonnet		Stem		Width between flats		Reference			
	Bolt hole																											
	d	d_1	$\frac{L}{L'}$	D	P.C. dia. C	No.	h	Nominal dia. of bolt					Height (approx.) (fully opened)	Lift	l	Handwheel D_2	$\frac{d_2}{d_2'}$	a	R	$\frac{H_1}{H_1'}$	Thread d_s	D_1	H_2	d_5		Thread d_6	S	Stuffing box d_7
15	15	20	$\frac{100}{55}$	80	60	4	12	M 10	9	$\frac{130}{120}$	5	80	$\frac{40}{44}$	3	40	$\frac{47}{37}$	M36×2	45	33	10	Tr14×3 (TW14)	8	17	32	32	2.02 1.98		
20	20	25	$\frac{110}{60}$	85	65	4	12	M 10	10	$\frac{140}{130}$	6	100	$\frac{48}{48}$	4	48	$\frac{53}{40}$	M42×2	52	36	12	Tr16×4 (TW16)	10	19	36	36	2.86 2.73		
25	25	30	$\frac{120}{65}$	95	75	4	12	M 10	10	$\frac{160}{145}$	8	125	$\frac{55}{55}$	4	55	$\frac{59}{44}$	M42×2	52	43	13	Tr18×4 (TW18)	10	21	36	36	3.54 3.44		
32	32	37	$\frac{140}{80}$	115	90	4	15	M 12	12	$\frac{170}{150}$	11	125	$\frac{68}{66}$	4	68	$\frac{61}{41}$	M52×2	65	48	13	Tr18×4 (TW18)	10	21	41	36	5.00 4.77		
40	40	45	$\frac{160}{80}$	120	95	4	15	M 12	12	$\frac{190}{165}$	14	140	$\frac{82}{78}$	5	82	$\frac{69}{45}$	M58×2	70	53	15	Tr20×4 (TW20)	12	23	41	41	6.48 5.99		

Remarks: 1. Flanges shall conform to the requirements of JIS B 2240 for a nominal pressure of 5K.

2. Thread d_3 shall conform to JIS B 0216. When 29° trapezoidal screw thread is used instead of metric trapezoidal screw thread, the requirements shown in Annex shall be used. Reference data are suffixed in parentheses. The use of 29° trapezoidal screw thread is not advisable for valves of the new design.3. Thread d_4 shall conform to the requirements of JIS B 0207.

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

5. Dimensions R apply to globe valves only.

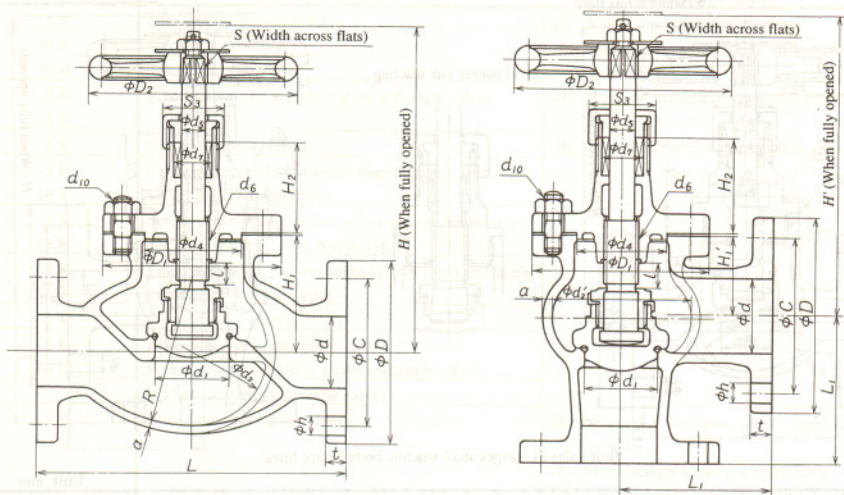
6. The calculated mass are of the bonnet material being BC6.

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

Documents

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Angle valve



Bolt holes of flanges shall straddle body centre lines

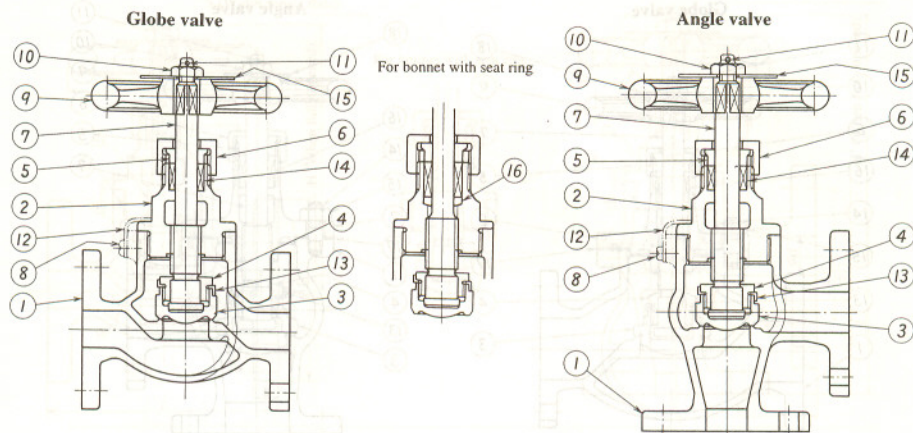
Unit: mm																																		
Nominal dia.	Flange														$\frac{H}{H'}$ Height (approx.) (fully opened)	Lift l	Body										Height of bonnet H_2	Stem			Stuffing box d_1	Width between flats S_1	Thread d_{18}	Reference
	d	d_1	$\frac{L}{L'}$	D	Bolt hole			Nominal dia. of bolt	t	d_2'	a	R	$\frac{H_1}{H_1'}$	D_1			D_4	Thread d_8	S															
					P.C. dia. C	N_o	h																											
50	50	50	$\frac{210}{100}$	130	105	4	15	M 12	14	$\frac{235}{200}$	21	140	$\frac{105}{90}$	6	14	0	$\frac{85}{52.5}$	115	60	63	16	Tr22x5 (TW22)	12	26	46	M12	$\frac{11.7}{10.1}$							
65	65	65	$\frac{250}{115}$	155	130	4	15	M 12	14	$\frac{260}{220}$	26	160	$\frac{260}{115}$	7	82	0	$\frac{100}{59.5}$	140	76	66	18	Tr24x5 (TW24)	14	28	28	M12	$\frac{17.0}{15.6}$							

Remarks: 1. Flanges shall conform to the requirements of JIS B 2240 for a nominal pressure of 5K.

2. Thread d_s shall conform to **JIS B 0216**. When 29° trapezoidal screw thread is used instead of metric trapezoidal screw thread, the requirements shown in **Annex** shall be used. Reference data are suffixed in parentheses. The use of 29° trapezoidal screw thread is not advisable for valves of the new design.
3. Thread d_{10} shall conform to the requirements of **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 R apply to globe valves only.

Attached Fig. 2 Construction, shape and dimensions of 5 K globe valve and angle valve

For nominal dia. 15-40



No.	Component	Material
1	Body	JIS H 5111-BC6
2	Bonnet	JIS H 5111-BC6 or JIS H 3250-C3771BD or C3771BE
3	Disc	JIS H 3250-C3771BD or C3771BE
4	Disc nut	JIS H 5111-BC6 or JIS H 3250-C3771BD or C3604BD
5	Packing gland	
6	Gland nut	
7	Stem	JIS H 3250-C3771BD or C3771BE
8	Cross recessed pan head machine screw	JIS H 3260-C2700W
9	Handwheel	JIS G 5501-FC200
10	Hexagonal nut	JIS H 3250-C3604BD
11	Split pin	JIS H 3260-C2600W
12	Bonnet lock washer	JIS H 3100-C2600P
13	Disc lock washer	
14	Packing	JIS F 7102
15	Name plate	JIS H 3100-C2801P
16	Seat ring	JIS H 3250-C3771BD or C3771BE or C3604BD

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

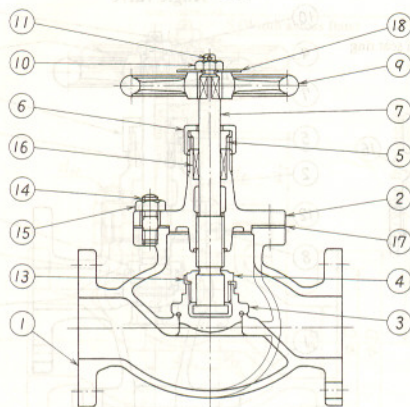
2. Instead of using split pin 11, hexagonal nut 10 may be substituted with a lock nut.

3. Names plates shall be furnished to the purchaser's instructions.

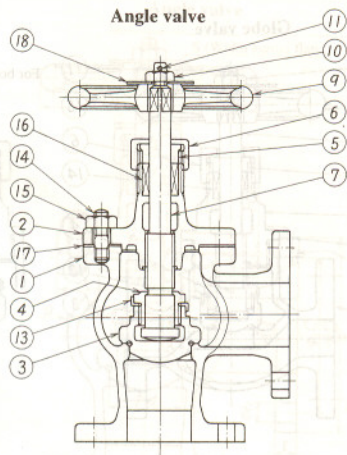
Attached Fig. 3 Materials of 5 K globe valve and angle valve

For nominal dia. 50-65

Globe valve



Angle valve



No.	Component	Material
1	Body	JIS H 5111-BC6
2	Bonnet	
3	Disc	
4	Disc nut	JIS H 5111-BC6 or
5	Packing gland	JIS H 3250-C3771BD or C3604BD
6	Gland nut	
7	Stem	JIS H 3250-C3771BD or C3771BE
9	Handwheel	JIS G 5501-FC200
10	Hexagonal nut	JIS H 3250-C3604BD
11	Split pin	JIS H 3260-C2600W
13	Disc lock washer	JIS H 3100-C2600P
14	Stud bolt	JIS H 3250-C3771BD
15	Hexagonal nut	JIS H 3250-C3604BD
16	Packing	JIS H 7102
17	Gasket	
18	Seat ring	JIS H 3100-C2801P

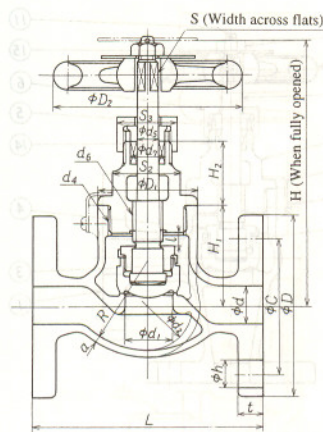
Remarks: 1. Letters in boldface indicate materials specified in Attached Table 1.

2. Instead of using split pin 11, hexagonal nut 10 may be substituted with a lock nut.

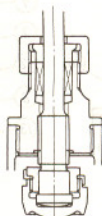
3. Name plates shall be furnished to the purchaser's instructions.

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

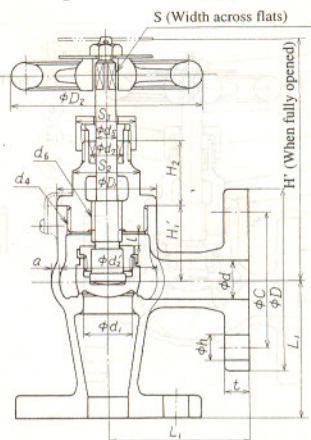
Globe valve



For bonnet with seat ring



Angle valve



Bolt holes of flanges shall straddle body centre lines

Unit: mm																											
Nominal dia.	Flange										$\frac{H_1}{H}$ Height (approx.) (fully opened)	Body			Bonnet			Stem			Stuffing box d_7	Width across flats		Reference			
	Bolt hole				Nominal dia. of bolt	t	Lift l	Handwheel D_2	$\frac{d_2}{d_1'}$	a		R	$\frac{H_1}{H_1'}$	Thread d_4	D_1	H_2	d_5	Thread d_6	S	S_2		S_3	Calculated mass (kg)				
	d	d_1	$\frac{L}{L_1}$	D																					P.C. dia. C	N_o	h
15	15	20	$\frac{110}{70}$	95	70	4	15	M 12	12	$\frac{130}{120}$	5	80	$\frac{40}{44}$	4	40	$\frac{47}{37}$	M36×2	45	33	10	Tr14×3 (TW14)	8	17	32	32	$\frac{2.76}{2.73}$	
20	20	25	$\frac{120}{75}$	100	75	4	15	M 12	14	$\frac{140}{130}$	6	100	$\frac{48}{48}$	4	48	$\frac{53}{40}$	M42×2	52	36	12	Tr16×4 (TW16)	10	19	36	36	$\frac{3.72}{3.65}$	
25	25	30	$\frac{130}{85}$	125	90	4	19	M 16	14	$\frac{160}{145}$	8	125	$\frac{55}{55}$	4	55	$\frac{59}{44}$	M42×2	52	43	13	Tr18×4 (TW18)	10	21	36	36	$\frac{5.20}{5.16}$	
32	32	37	$\frac{160}{95}$	135	100	4	19	M 16	16	$\frac{170}{150}$	11	125	$\frac{68}{66}$	5	68	$\frac{61}{41}$	M52×2	65	48	13	Tr18×4 (TW18)	10	21	41	36	$\frac{6.91}{6.72}$	
40	40	45	$\frac{180}{100}$	140	105	4	19	M 16	16	$\frac{190}{165}$	14	140	$\frac{82}{78}$	6	82	$\frac{69}{45}$	M58×2	70	53	15	Tr20×4 (TW20)	12	23	41	41	$\frac{8.43}{8.13}$	

Remarks: 1. Flanges shall conform to the requirements of JIS B 2240 for a nominal pressure of 16 K.

2. Thread d_6 shall conform to JIS B 0216. When 29° trapezoidal screw thread is used instead of metric trapezoidal screw thread, the requirements shown in Annex shall be used. Reference data are suffixed in parentheses. The use of 29° trapezoidal screw thread is not advisable for valves of the new design.3. Thread d_1 shall conform to the requirements of JIS B 0207.

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

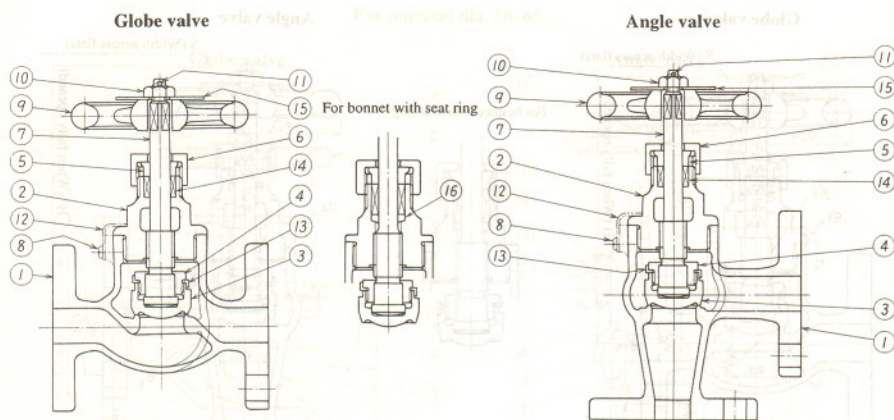
5. Dimensions R apply to globe valves only.

6. The calculated mass are of the bonnet material being BC6.

Attached Fig. 5 Construction, shape and dimensions of 16 K globe valve and angle valve

Documents

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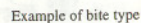
No.	Component	Material
1	Body	JIS H 5111-BC6
2	Bonnet	JIS H 5111-BC6 or JIS H 3250-C3771BD or C3771BE
3	Disc	JIS H 3250-C3771BD or C3771BE
4	Disc nut	JIS H 5111-BC6 or JIS H 3250-C3771BD or C3604BD
5	Packing gland	
6	Gland nut	
7	Stem	JIS H 3250-C3771BD or C3771BE
8	Cross recessed pan head machine screw	JIS H 3260-C2700W
9	Handwheel	JIS G 5501-FC200
10	Hexagonal nut	JIS H 3250-C3604BD
11	Split pin	JIS H 3260-C2600W
12	Bonnet lock washer	JIS H 3100-C2600P
13	Disc lock washer	
14	Packing	JIS F 7102
15	Name plate	JIS H 3100-C2801P
16	Seat ring	JIS H 3250-C3771BD or C3771BE or C3604BD

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

2. Instead of using split pin 11, hexagonal nut 10 may be substituted with a lock nut.

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

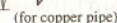
Attached Fig. 6 Materials of 16 K globe valve and angle valve



Brazing
(for copper pipe)

H (When fully opened)

(for steel pipe)



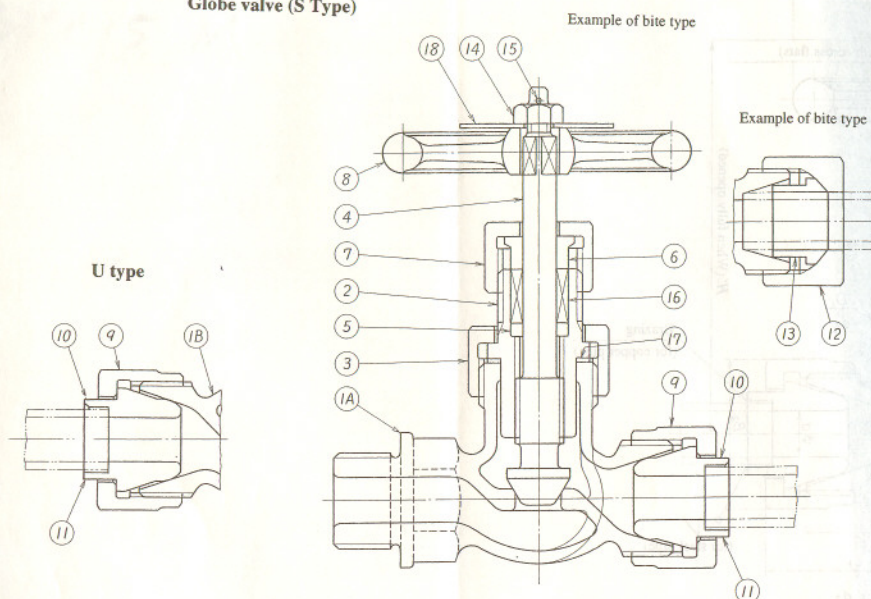
Brazing
(for copper pipe)

T' (When fully opened)

Unit : mm

2. Thread d_6 shall conform to the requirements of **JIS B 2005**, and threads d_2 and D_1 **JIS B 2007**.
3. The upper data represent dimensions or calculated masses of globe valves, while the lower data represent those of angle valves.
Masses in parentheses show the U type of globe valves.
4. Dimensions R apply to globe valves only.
5. Dimensions L and L_1 apply only to globe valves of the U type.

Globe valve (S Type)



No.	Component	Material	No.	Component	Material
1A	Body (S Type)	JIS H 5111-BC6	10	Nipple for copper pipe	JIS H 5101-YBsC1 or JIS H 3250-C1100BD
1B	Body (U Type)		11	Nipple for steel pipe	JIS G 4051-S15C
2	Bonnet	JIS H 5111-BC6 or JIS H 3250-C3771BD or C3771BE or C3604BD	12	Union nut	JIS G 4051-S15C
3	Bonnet nut		13	Sleeve	
4	Stem	JIS H 3250-C3771BD or C3771BE	14	Hexagonal nut	
5	Packing gland	JIS H 5111-BC6 or	15	Split pin	JIS H 3250-C3604BD
6	Seat ring	JIS H 3250-C3771BD or C3604BD	16	Packing	JIS H 3260-C2600W
7	Gland nut		17	Gasket	JIS F 7102
8	Handwheel	JIS G 5501-FC200	18	Name plate	JIS H 3100-C2801P-H
9	Union nut	JIS H 5111-BC6 or JIS H 3250-C3771BD			

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

2. S15C of JIS G 4051 shall be subjected to suitable heat treatment.

3. Instead of using split pin 15, hexagonal nut 14 may be substituted with a lock nut.

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

Attached Fig. 8 Materials of 20 K globe valve and angle valve

Angle valve

