

JIS

JAPANESE INDUSTRIAL STANDARD

Air Vent Valves for Water Works

JIS B 2063—1987

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In the event of any doubt arising,
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Air Vent Valves for Water Works

B 2063-1987

1. Scope

This Japanese Industrial Standard specifies the air vent valves to be used for water works with nominal pressure 7.5 K, 10 K and 16 K, herein-after referred to as the "valve".

Remark: The units and numerical values given in { } in this standard are in accordance with the traditional units and are currently the criterial in force.

2. Definitions

For the purpose of this standard, the following definitions apply. Other terms and definitions are given in JIS B 0100.

- (1) working pressure Pressure of fluid in ordinary working state.

Remark: This designates the "maximum working pressure" (static hydraulic pressure) used hitherto.

- (2) maximum permissible pressure The maximum pressure permissible for pressure withstanding part at designated temperature.

Remark: The maximum pressure designates the pressure not causing plastic deformation in the state in which water hammer pressure is added to working pressure.

- (3) flanged end Type in which the end portion is flange.

Remark: This designates that to be connected with the flanged end specified in JIS G 5527.

- (4) screwed end Type in which the end portion has thread ridges.

Remark: This designates that to be connected with taper pipe internal thread and parallel pipe internal tyhrad of JIS B 0203.

- (5) large amount exhaust In valve, to exhaust from large air hole when water is filled in pipe.

- (6) large amount suction In valve, to take in air from large air hole when water in pipe is removed.

- (7) pressurized exhaust In valve, to exhaust automatically from small air hole the air accumulated at high place of pipe during feeding of water.

Applicable Standards and Reference Standards: See page 27.

3. Classification

3.1 Classification of Valves The valves shall be classified into three types of quick, single and double types and according to nominal pressure and form of connecting portion, further subclassified as given in Table 1.

Table 1

Classification			Nominal pressure	Working pressure			Highest permissible pressure		
				MPa	{bar}	{kgf/cm ² }	MPa	{bar}	{kgf/cm ² }
Quick type	Class 2	Flanged end	7.5 K	0.74	{ 7.4 }	{ 7.5 }	1.27	{12.7}	{13}
		Screwed end ⁽¹⁾	7.5 K	0.74	{ 7.4 }	{ 7.5 }	1.27	{12.7}	{13}
	Class 3	Flanged end	10 K	0.98	{ 9.8 }	{10 }	1.37	{13.7}	{14}
		Screwed end ⁽¹⁾	10 K	0.98	{ 9.8 }	{10 }	1.37	{13.7}	{14}
	Class 4	Flanged end	16 K	1.57	{15.7}	{16 }	2.16	{21.6}	{22}
		Screwed end ⁽¹⁾	16 K	1.57	{15.7}	{16 }	2.16	{21.6}	{22}
Single type	Class 2	Screwed end ⁽¹⁾	7.5 K	0.74	{ 7.4 }	{ 7.5 }	1.27	{12.7}	{13}
	Class 3	Screwed end ⁽¹⁾	10 K	0.98	{ 9.8 }	{10 }	1.37	{13.7}	{14}
	Class 4	Screwed end ⁽¹⁾	16 K	1.57	{15.7}	{16 }	2.16	{21.6}	{22}
Double type	Class 2	Flanged end	7.5 K	0.74	{ 7.4 }	{ 7.5 }	1.27	{12.7}	{13}

Note (1) Where the fitting portion is fitted with flange, the flange shall be as given in Attached Tables 1 and 2.

3.2 Nominal Diameters The nominal diameter of valve shall be as given in Table 2 according to the classification of valve.

Table 2

Classification			Nominal diameter
Quick type	Class 2 Class 3 Class 4	Flanged end	75, 100, 150, 200
		Screwed end	25
Single type	Class 2 Class 3 Class 4	Screwed end	13, 20, 25
		Screwed end	25
Double type	Class 2	Flanged end	75, 100, 150

4. Quality

4.1 Performance

4.1.1 Functions The valve shall be equipped with the following functions according to class.

(1) Quick Type

- (a) Quick exhaust function (to conduct quickly a large amount exhaust.)
- (b) Quick suction function (to conduct quickly a large amount suction.)
- (c) Pressurized exhaust function (to conduct smoothly pressurized exhaust.)

(2) Single Type

- (a) Exhaust function from small air hole
- (b) Suction function from small air hole
- (c) Pressurized exhaust function

(3) Double Type

- (a) Large amount exhaust function
- (b) Large amount suction function
- (c) Pressurized exhaust function

4.1.2 Pressure Withstanding of Valve Cage When pressure test of valve cage has been conducted according to 8.1, each part of valve cage shall be free from any abnormality.

4.1.3 Leakage of Ball Valve, Cock or Basic Valve When the ball valve, cock or basic valve has been conducted with leakage test according to 8.2, the valve seat portion shall be free from leakage.

4.1.4 Leakage of Large and Small Air Hole Valve Seats When the large and small air hole valve seats have been conducted with leakage test according to 8.3, the valve seat portions shall be free from leakage.

4.1.5 Actuation The valve shall satisfy the following actuations:

- (1) When tested according to 8.3, the exhaust of air and actuation of float valve shall be good and smooth.
- (2) When tested according to 8.4, the large amount exhaust of air (Q) shall be the valve given in Table 3 or over.

Table 3

Classification		Nominal diameter				
		25	75	100	150	200
Quick type	Minimum exhaust amount at valve differential pressure (h_v) 4.9 kPa {0.049 bar} {0.05 kgf/cm ² } m ³ /min	1.3	11	19	43	76
Double type	Minimum exhaust amount at valve differential pressure (h_v) 0.98 kPa {0.0098 bar} {0.01 kgf/cm ² } m ³ /min	—	2.6	4.0	6.7	—

- (3) In quick type at large amount exhaust, until the air vent valve differential pressure (h_v) reaches 9.8 kPa {0.098 bar} {0.1 kgf/cm²}, the idler valve disc or float valve disc shall not be so sucked up by exhaust air as to block the large air hole.
- (4) In double type at large amount exhaust, until the air vent valve differential pressure (h_v) reaches 1.96 kPa {0.0196 bar} {0.02 kgf/cm²}, the float valve disc shall not be so sucked up by exhaust air as to block the large air hole.
- (5) The valve, even if fitted inclined within 2 degrees, shall actuate smoothly.

4.2 Structure, Form and Dimensions The structure, form and dimensions of valve shall be as follows:

- (1) The quick type shall consist of valve cage, float valve disc, idler valve disc, side plate, etc. and shall be equipped with large and small air holes.

The large air hole shall have large amount exhaust function and when the large amount exhaust has ended, shall be blocked by idler valve disc and shall be so constructed as to open quickly when large amount suction is needed.

The small air hole shall conduct pressurized exhaust and be so constructed as to be blocked by float valve disc.

- (2) The idler valve disc shall be set on the upper portion of float valve disc for quick type and shall be so constructed as to be actuated by buoyancy of float valve disc.
- (3) At the upper portion of valve cage for quick type, a side plate with large air hole and large air hole valve seat shall be set.

The idler valve disc or side plate shall be fitted with small air hole valve seat and shall be of form satisfying 4.1.1 (1) (c).

- (4) The single type shall be so constructed as to consist of valve cage, float valve disc, side plate, small air hole, etc.
- (5) The double type shall consist of valve cage and two float valve discs, side plate, basic valve, valve stem, etc. and shall be set with large and small air holes separately in left and right.

The large air hole shall have large amount exhaust function and large amount suction function and the small air hole shall have pressurized exhaust function and either shall be so constructed as to be opened or be shut by float valve.

The basic valve shall be anticlockwise opened and clockwise shut. However, according to the designation of purchaser, it may be clockwise opened and anticlockwise shut.

The screw thread of valve stem and seat holding nut shall comply with JIS B 0222.

- (6) Apparent specific gravity of float valve disc shall be 0.75 to 0.8.
- (7) The small air hole valve seat shall be provided with small air hole and the hole diameter shall be 1.6 mm or over, and its seat surface shall be perpendicular to axial line of vent and smooth.
- (8) The upper part of side plate for quick and double types shall be provided with cover so as not to introduce dusts.
- (9) The screwed end of quick type and the single type shall be provided with ball valve or cock.

The underside of ball valve or cock shall be so constructed with flange as given in Attached Tables 1 and 2.

- (10) The main dimensions of valve shall comply with Attached Tables 1, 2 and 3.
- (11) An example of structure and form of valve is shown in Attached Tables 1, 2 and 3.

5. Appearance

5.1 Appearance before Coating The surface of cast product shall be smooth and free from blow hole, crack, flaw, fin and other defects harmful to use.

However, as for slight flow holes, flaws, etc., depending upon the approval of purchaser, they may be arc-welded to repair.

5.2 Appearance after Coating The finish of coated surface shall be free from bare spot, bubble, blistering, peeling, adhesion of foreign matters, conspicuous coat heap and other harmful defects.

6. Materials

The materials of each part of valve shall comply with Attached Tables 1, 2 and 3.

Further, the synthetic resins shall not cause infections effects to quality of water.

7. Coating

7.1 Coating Materials The materials to be used for coating of valve shall not affect harmfully to health and shall not be damaged by water nor infections to quality of water after drying and shall be impervious to temperature change and shall be either of the following:

- (1) Black varnish for water works
- (2) That designated by the purchaser

7.2 Places to Be Coated and Coating Methods The places to be coated and coating methods shall be as follows:

- (1) Coat the iron and steel parts ⁽²⁾ of valve. In this case, prior to coating, remove the rusts and other adhered matters sufficiently and then coat.

Note ⁽²⁾ Exclude the cases of stainless steel.

- (2) In the case where coating material of 7.1 (1) is used, conduct brush or spray coating.
- (3) In the case where coating material of 7.1 (2) is used, conduct according to the direction of purchaser.

8. Test Methods

8.1 Pressure Test of Valve Cages As for the pressure test of valve cage, fit the valve on the upper part of test device and apply the hydraulic pressure given in Table 4.

Further, the holding period of time shall be 1 min or over after the specified hydraulic pressure has been reached.

Table 4

Classification	Hydraulic pressure		
	MPa	{bar}	{kgf/cm ² }
Class 2	1.72	{17.2}	{17.5}
Class 3	2.25	{22.5}	{23}
Class 4	2.35	{23.5}	{24}

8.2 Leakage Test of Ball Valve, Cock or Basic Valve As for the test of ball valve, cock or basic valve, close these and apply the hydraulic pressure given in Table 5.

Further, the holding time shall be as given in Table 6.

Table 5

Classification	Hydraulic pressure		
	MPa	{bar}	{kgf/cm ² }
Class 2	0.74	{7.4}	{7.5}
Class 3	0.98	{9.8}	{10}
Class 4	1.72	{17.2}	{17.6}

Table 6

Unit: min

Classification	Holding time
Quick screwed end single type	$\frac{1}{4}$
Quick flanged end double type	$\frac{1}{2}$

Remark: The values given in Table 6 indicate the minimum value of test time after the test pressure has reached the specified hydraulic pressure.

Reference: The values in Table 6 are in coincidence with ISO 5208.

8.3 Leakage Test and Pressurized Exhaust Test of Large and Small Air Hole Valve Seats As for the leakage test and pressurized exhaust test of large and small air hole valve seats, fit valve to the upper part of test device, open slowly the on-off valve, examine exhaust of air and function of float valve disc, etc. and then apply hydraulic pressure to examine the leakage of valve seat portion. Next, inject little by little continuously the compressed air or nitrogen gas to examine the state of actuation of float valve disc, etc.

8.4 Large Amount Exhaust Test Conduct the large amount exhaust test according to Appendix to measure the amount of exhaust from valve.

9. Inspection

As for the inspection of valves, the test shall be conducted according to 8., further according to JIS B 2003, etc., the whole number shall be inspected on the following each item and shall comply with 4. to 7. However, large amount exhaust inspection shall be conducted by sampling inspection and the sampling method shall be agreed between the parties concerned on delivery.

- (1) Pressure inspection of valve cage
- (2) Leakage inspection of ball valve, cock or basic valve
- (3) Leakage inspection of large and small air hole valve seats