

JIS

JAPANESE INDUSTRIAL STANDARD

**Pneumatic system—2-Port
solenoid operated valves**

JIS B 8373—1993

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by

Japanese Standards Association

In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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Pneumatic system
— 2-Port solenoid operated valves

B 8373-1993

1. Scope This Japanese Industrial Standard specifies the 2-port solenoid operated valves for pneumatic use to be used in the pneumatic system for the mechanical equipments (hereafter referred to as "valves").

Further, the working conditions of the valves shall be as given in the following:

- (1) Maximum working pressure 0.7 MPa {7.14 kgf/cm²} or under
- (2) Ambient temperature and working air temperature -5°C to 50°C
(however, the inside of the valve shall not be that freezes).
- (3) Vibration and impact The valves shall not generally be subjected to harmful vibration and impact.
- (4) Actuation frequency The maximum actuation frequency shall be one time per second, and the minimum actuation frequency shall be one time per 30 days.
- (5) Quality of air The quality of the air to be supplied to the valves shall be allowed to conform to the service object, functions and performances, and ambient environment of the valves, as well as be treated with the control of the quality of the air for enhancing the reliability, endurance and safety of the valves.

- Remarks
1. The pressure to be used in this Standard shall indicate the gauge pressure.
 2. The standards cited in this Standard are as follows:
 - JIS B 0142 Glossary of terms for oil hydraulics and pneumatics
 - JIS B 0203 Taper pipe threads
 - JIS B 2210 Basic dimensions of ferrous material pipe flanges
 - JIS B 8370 General rule for pneumatic systems
 - JIS C 0704 Insulation test for control gear
 - JIS C 1302 Insulation resistance testers (battery operated)
 - JIS C 4003 Classification of materials for insulation of electrical machinery and apparatus
 - JIS G 3452 Carbon steel pipes for ordinary piping
 3. The units, numerical values and numerical formulae given in { } in this Standard are based on the traditional units, and are appended for informative reference.
 4. As regards the quality of the air, it shall be in accordance with 7. (Energy transmission and cleaning equipment) of JIS B 8370.

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2. Definitions For the main terms used in this Standard, the definitions given in JIS B 0142 apply.

3. Types of valves and marking symbols

3.1 Types of valves The types of the valves shall be classified as given in the following according to the type symbols of valves, nominal bores of ports, conditions of valve passages, working pressures, rated voltages, rated frequencies and characteristics.

- (1) Type symbols of valves and nominal bores of ports The type symbols of the valves, nominal bores of the ports and connecting methods shall be in accordance with Table 1.

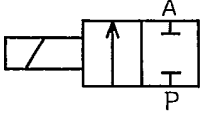
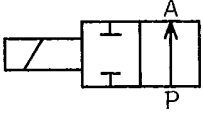
Table 1. Type symbols of valves, nominal bores of ports and connecting methods

Type symbol of valve	Nominal bore of port	Connecting method	
		Designation of screw joint	Designation of flange joint
DV2	6	Rc 1/8	—
	8	Rc 1/4	—
	10	Rc 3/8	10
	15	Rc 1/2	15
PV2	8	Rc 1/4	—
	10	Rc 3/8	10
	15	Rc 1/2	15
	20	Rc 3/4	20
	25	Rc 1	25

- Remarks 1. The type symbol DV2 shall indicate that of direct acting type 2-port, and PV2 shall indicate that of pilot operated type 2-port.
2. The screw threads of the screw joints shall generally be of the taper internal pipe threads as specified in JIS B 0203, and the flanges of the flange joints be the ordinary shaped flanges of nominal pressure 10 K as specified in JIS B 2210.

- (2) Conditions of valve passages As to the conditions of the valve passages, under the condition where no voltage is applied to the solenoid, that passage, in which the air does not flow from the inlet of valve (port P) to the outlet of valve (port A), shall be designated as the normally closed, and that in which the air flows as the normally open. The symbols thereof shall be NC for the normally closed, and be NO for the normally open, and the conditions of connection of the ports shall be in accordance with Table 2.

Table 2. Conditions of valve passages

Marking symbol	NC	NO
Passage symbol		

Remarks: The port P expresses the inlet, and the port A the outlet.

- (3) Working pressures The working pressures of the valves shall be 0 MPa {0 kgf/cm²} to 0.7 MPa {7.14 kgf/cm²} for the direct acting type, and 0.1 MPa {1.02 kgf/cm²} to 0.7 MPa {7.14 kgf/cm²} for the pilot operated type.

In addition, the pressure difference between the port P and the port A shall be 0.08 MPa {0.82 kgf/cm²} or over.

- (4) Rated voltage and rated frequency The rated voltage of the solenoid shall be 100 V or 200 V a.c. and 12 V or 24 V d.c. The rated frequency of a.c. shall be 50 Hz, 60 Hz or 50/60 Hz for common use.

Further, the voltage variation at the time of service shall be within the range of 90 % to 110 % the rated voltage.

- (5) Characteristics The flow rate characteristics (effective cross-sectional area), air leakage, endurance (number of times of actuation) and response time shall be in accordance with Table 3.

Table 3. Characteristics of valves

Type symbol of valve	Nominal bore of port	Effective cross-sectional area mm ²	Air leakage cm ³ /min (ANR)	Number of times of actuation 10 ⁴ times	Response time s
DV2	6	1.2 min.	10 max.	200	0.05 max.
	8	3 min.	10 max.		
	10	6 min.	25 max.		
	15	11 min.	25 max.		
DV3	8	20 min.	10 max.		0.08 max.
	10	40 min.	25 max.		
	15	60 min.	25 max.		
	20	110 min.	50 max.		0.1 max.
	25	190 min.	50 max.		