

KS

KOREAN INDUSTRIAL STANDARD

2-port Solenoid Operated Valves for Pneumatic Use

KS B 6347-1987

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Rep. of Korea

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2-port Solenoid Operated Valves for Pneumatic Use

1. Scope

This Korean Industrial Standard specifies the 2-port solenoid operated valves of direct acting type and pilot operated type for pneumatic circuits (hereafter referred to as "valves"). However, the working conditions of the valves shall be as given in the following :

(1) Maximum Working Pressure

The maximum working pressure (hereafter described as gauge pressure) shall be 7 kgf/cm² {700 kPa}.

(2) Ambient Temperature and Working Air Temperature

5°C to 50°C.

(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) Filter

The filter specified in KS B 6348 shall be supplied to pneumatic circuits using valves.

Remark The units, numerical values and numerical formulae given in { } in this Standard are based on the International System of Unit (SI), and are appended for informative reference.

The conversion rate shall be as follows :

$$1 \text{ kgf/cm}^2 = 98.0665 \text{ kPa} \approx 100 \text{ kPa}$$

2. Definition

For the main terms used in this Standard, the definitions given in KS B 0120.

Normative References :

- KS B 0210 Glossary of Terms for Oil Hydraulic and Pneumatics
- KS B 0221 Parallel Pipe Threads
- KS B 0222 Taper Pipe Threads
- KS B 1513 Basic Dimensions of 10 kgf/cm² Iron Steel Material Pipe Flanges
- KS B 6348 Filters for Pneumatic Use
- KS C 4004 Classification of Materials for Insulation of Electrical Machinery and Apparatus
- KS D 3507 Carbon Steel Pipes for Ordinary Piping

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
Direct acting type (Symbol DV2)	6	PT $\frac{1}{8}$	—
	8	PT $\frac{1}{4}$	—
	10	PT $\frac{3}{8}$	10
	15	PT $\frac{1}{2}$	15
Pilot operated type (Symbol PV2)	8	PT $\frac{1}{4}$	—
	10	PT $\frac{3}{8}$	10
	15	PT $\frac{1}{2}$	15
	20	PT $\frac{3}{4}$	20
	25	PT 1	25

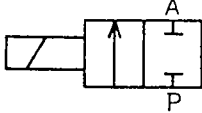
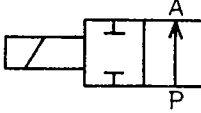
Remarks 1. The type symbol DV2 shall indicate that of direct acting type 2-port, and PV2 shall indicate that of pilot operated type 2-port.

2. The screw threads of the screw joints shall generally be of the taper internal pipe threads as specified in KS B 0222 (Taper Pipe Threads), and the flanges of the flange joints be the ordinary shaped flanges of nominal pressure 10K as specified in KS B 1513 (Basic Dimensions of 10 kgf/cm² Iron Steel Material Pipe Flanges)

(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 condition of connection of the ports shall be in accordance with Table 2.

Table 2 Conditions of Valve Passages

Marking symbol	NC	NO
Passage symbol		

Remark The port P expresses the inlet, and the port A the outlet.

(3) Working Pressures

The working pressures of the valves shall be 0 kgf/cm² {0 kPa} to 7 kgf/cm² {700 kPa} for the direct acting type, and 1 kgf/cm² {100 kPa} to 7 kgf/cm² {700 kPa} for the pilot operated type.

In addition, the pressure difference between the port P and the port A shall be 0.8 kgf/cm² {80 kPa} or over.

(4) Rated Voltage and Rated Frequency

The rated voltage of the solenoid shall be 100V or 220V a.c.. The rated frequency of a.c. shall be 60Hz.

However, the voltage variation at the time of service shall be within the range of $\pm 10\%$ the rated voltage.

(5) Characteristics

The flow rate characteristics, air leakage, endurance and response time shall be in accordance with Table 3.

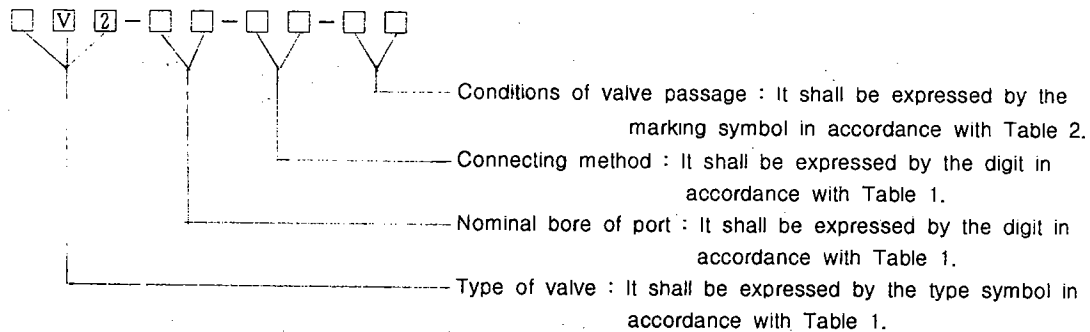
Table 3 Characteristics of Valves

Type symbol of valve	Characteristics	Effective cross-sectional area	Valve of air leakage ⁽¹⁾	Number of times of actuation 10 ⁴ times	Response time s.
	Type bore of port	mm ²	cm ³ /min		
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.		
PV2	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.		

Note ⁽¹⁾ The value of air leakage is converted to the standard conditions.

3.2 Marking Symbols

The expressing method of the marking symbols of the valves shall be in accordance with the following :



Example 1. DV2-06-1/8-NC

Example 2. PV2-25-25-NO

4. Performances

4.1 Actuation

When tested in accordance with the provisions of 9.1, the switching actuation shall be smooth, and be free from abnormal sound.

4.2 Flow Rate Characteristics

The flow rate characteristics shall be expressed by the effective cross-sectional areas, and the values, when tested in accordance with the provisions of 9.2, shall be as given in Table 3.

4.3 Dynamic Performance

The dynamic performance shall be expressed by the response time, when tested in accordance with the provisions of 9.3, and its value shall be as given in Table 3.

4.4 Temperature Rise

When the valve is tested according to the specifications of 9.4, the value of temperature rise of the energized solenoid shall be as shown in Table 4.

Table 4

Classification of insulation	Temperature rise value (°C)
Class A	65 max.
Class E	80 max.
Class B	90 max.
Class F	115 max.
Class H	140 max.

Remark The class of insulation is defined according to the specification of KS C 4004.