Pneumatic components

Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 59 for general precautions for using valves.

Product-specific cautions: Direct acting 3-port pneumatic valve 3PA/3PB series

Design/selection

1. Common

⚠CAUTION

■ The applications will differ from solenoid valves for vacuum retention. When pads are being used, install a filter between the pad and the valve to prevent foreign matter from entering the unit.

■ Do not use this as a solenoid valve for emergency cutoff. If left pressurized for a long time, the starting response could be delayed.

■ When using the unit with vacuum, be sure to select the direct current (DC) specifications.
In addition, install a vacuum filter on the intake port.

2. Surge suppressor

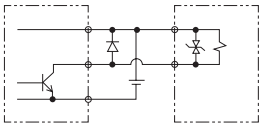
■ The surge suppressor attached with the solenoid valve is intended to protect the output contacts for the solenoid valve drive. There is no significant protection for the other peripheral devices, and devices could be damaged or could malfunction due to a surge. As well, surges generated by other devices may be absorbed and cause damage such as burning. Note the following points.

(1) The surge suppressor functions to limit solenoid valve surge voltage, which can reach several hundred volts, to a low voltage level that the output contact can withstand. Depending on the output circuit used, this may be insufficient and could result in damage or malfunction. Check whether the surge suppressor can be used within the surge voltage limit of the solenoid valve in use, the output device's withstand pressure and circuit structure, and by the degree of return delay time. When necessary, provide other surge countermeasures. The inverse voltage surge generated when OFF can be suppressed to the following levels.

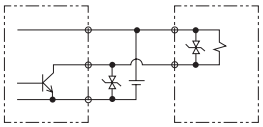
Specification voltage	Inverse voltage when OFF
12 VDC	Approx. 27 V
24 VDC	Approx. 47 V

(2) If the output unit is an NPN, a surge voltage equaling the voltage shown in the table at left plus the power supply voltage may be applied to the output transistor.

[Output transistor protection circuit: Installation example 1]



[Output transistor protection circuit: Installation example 2]



(3) If another device or solenoid valve is connected in parallel to the solenoid valve, the inverse voltage surge generated when the valve is OFF would apply to those devices. Even in the case of a solenoid valve with 24 VDC surge suppressor, a surge voltage may reach negative tens of volts for some models. This inverse voltage may cause damage or malfunction to other components connected in parallel. Avoid parallel connection of devices susceptible to inverse polarity voltages, e.g., LED indicators.
When driving several solenoid valves in parallel, the surge from other solenoid valves may enter the surge suppressor of one solenoid valve, and it may burn depending on the current value. When driving several solenoid valves with surge suppressors in parallel, surge current could concentrate at the surge suppressor with the lowest limit voltage and cause similar burning. Due to the variations in surge suppressor limit voltage that exist even among solenoid valves of the same model No., in the worst case the surge suppressor may burn out. Avoid driving several solenoid valves in parallel.

(4) The surge suppressor incorporated in the solenoid valve will often be short-circuited if it is damaged by overvoltage or overcurrent from other solenoid valves. Where there is a failed surge suppressor, if a large current flows when the output is ON, in the worst case scenario, the output circuit or solenoid valve could be damaged or ignited. Do not continue energizing in a state of failure. Additionally, to prevent large currents from continuing to flow, connect an overcurrent protection circuit to the power supply and drive circuit, or use a power supply with overcurrent protection.

Use/maintenance

⚠CAUTION

■ Continuous energizing for long periods may accelerate degradation of the solenoid valve. Furthermore, use with caution under the working conditions listed on the right, as with continuous energization.

· When energized time exceeds non-energized time in intermittent energizing
· When one energizing session exceeds 30 minutes in intermittent energizing

Consider heat dissipation when installing the product.
Contact CKD when energizing this device continuously.