Pneumatic components

Safety Precautions

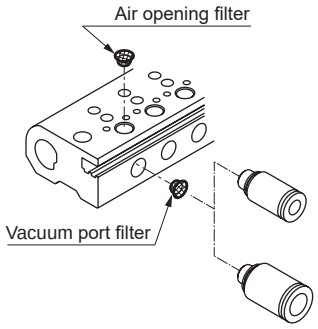
Be sure to read this section before use.
Also refer to the precautions in "Direct acting 3-port valve 3Q Series" of Intro Page 59 for general precautions for using valves

Product-specific cautions: 3QR vacuum switch unit MV3QR Series

Design/selection

WARNING

- This product is designed for vacuum. Use only vacuum. Also, use with pressure or temperature exceeding the specifications range may result in damage or operational faults.
- If the adsorbed object (workpiece) is at the risk of falling off, be sure to provide a preventive measure for safety.
- The solenoid valve allows slight leakage. Using it in vacuum for long periods may cause problems.
- Do not use the product in areas containing corrosive, flammable or explosive gases, chemicals, sea water and water vapor. Never suction these up.
- It is equipped with mesh filters at air ports of the vacuum port and manifold, which prevent the intake of foreign matter, and prevent problems from occurring in the valve (mesh diameter: ø0.3 mm).
  Do not detach or press down the mesh filter forcibly. The filter could deform which could result in a pressure loss, causing problems. If contaminants and foreign matters are found on the filter surface, blow them lightly, or remove them by tweezers, etc.



- If the foreign matter trapping capacity of vacuum suction is insufficient for your application, you can either use the optional insert vacuum filter or install vacuum filters in between the pad/nozzle and valve.
  When using vacuum filters, be sure to perform routine inspections and cleaning, as well as regular maintenance and replacement. Clogging could decrease performance.

CAUTION

- The suction tact may be delayed due to insufficient intake flow rate as the number of solenoid valves simultaneously operated increases. Make sure that the design has sufficient margin by following the table below.

■ [Recommended] manifold maximum simultaneous operation max. station number

Vacuum supply conditions		Solenoid valve specifications	
Bore size *		Standard specs	Large flow rate specs
ø4	One side supply	3 stations	2 stations
	Dual-sided supply	7 stations	5 stations
ø6	One side supply	6 stations	7 stations
	Dual-sided supply	10 stations	10 stations

* Be sure that the tube length is less than 1 m

Mounting, installation and adjustment

CAUTION

- Do not use a spiral hose.
  Especially when used at the vacuum side, malfunction due to the piping resistance will occur as below.
  (1) Delay of vacuum achievement time
  (2) Loss of vacuum at the suction end due to lowering of flow rate
  (3) Unstable operation of the vacuum switch
- Be sure that the vacuum side piping is as short as and with the largest I.D. possible. Piping that is too long or thin may cause the response time to be delayed when releasing, and make it difficult to ensure the required suction flow rate.
- For cautions regarding push-in fittings, also read “Safety precautions for fittings/tubes” in “Pneumatic/ Vacuum/Auxiliary Components (No. CB-024-SA)”.

Use/maintenance

WARNING

- Do not apply high tensile force or bending force to the lead wire. Failure to observe this could lead to disconnection.

CAUTION

- The coil may become hot due to ambient temperature or energizing time. Be sufficiently careful when touching the valve.
- Long energizing time causes performance deterioration of the solenoid valve. Note the following points for the standard flow rate in particular.
  · The energizing time should be the same as or below the de-energizing time for intermittent energizing.
  · One energizing cycle should be 5 minutes or less.
  · Set so that the peripheral temperature of the solenoid valve does not exceed max. working temperature.
- Use appropriate torque to tighten the pipes when connecting them.
  · The purpose is to prevent air leakage and damage to bolts. First tighten the bolts by hand to ensure that the threads are not damaged, then use a tool.

Port thread	Tightening torque N·m
M5	1.0 to 1.5
Rc1/8	3 to 5

- Tighten the solenoid valve with an appropriate torque when installing it.
  · Excessive tightening may damage the valve.
  Tightening torque: 0.10 to 0.14 N·m
  · Use a #0 screwdriver.

Product-specific cautions: Pressure sensor

Design/selection

⚠ WARNING

■ Use this product in accordance with specifications.
· Use for applications, or at load currents, voltages, temperatures, impacts or sites excluded from the specifications could result in damage or malfunctions.

■ This product is used for air and low vacuum.

■ The customer is responsible for checking safety and taking appropriate countermeasures for using fluids other than applicable fluids. Do not use this product for corrosive or flammable gases or for oxygen.

■ Power supply voltage
Use a stable DC power supply. When using a unit power supply such as switching power supply, ground the F.G. (frame ground). Also, do not use this product at levels exceeding the power supply voltage. The product could rupture or burn if voltage exceeding the working range is applied or if an AC power supply (100 VAC) is applied.

■ Load short circuit
Do not short-circuit the load. Failure to observe this could result in rupture or burning.

■ Incorrect wiring
Avoid incorrect wiring such as mistaken power source polarities, etc. Failure to observe this could result in rupture or burning.

■ Connecting load
The output impedance of the analog output section is 1 kΩ . If the impedance of the connecting load is small, output error increases. Check error with the impedance of the connecting load before using.

⚠ CAUTION

■ When applying positive pressure for vacuum burst to the product to check vacuum suction, check that it does not exceed the specified proof pressure.

Mounting, installation and adjustment

⚠ WARNING

■ There is a risk of electric shock by touching the electrical wiring connections (bare, live parts). Always turn the power OFF before carrying out wiring. Never touch the live parts with wet hands.

⚠ CAUTION

■ Do not apply high tensile force (10N or more) or bending force to the lead wire of the sensor head. Failure to observe this could result in a wire break or damage.

■ Wiring
· Turn power OFF before wiring this product. Discharge static electricity from personnel and tools before and during work. Connect and wire bending-resistant material, such as robot wire material, for the movable sections.

■ To connect to an output terminal or power supply terminal (relay, valve, etc.), install a surge voltage absorption circuit. Avoid applications that exceed the rated current. Do not short-circuit the output terminal with other terminals. It could damage the sensor.

■ Installation
Install this product and wiring as far away as possible from sources of noise such as power distribution wires. Wiring or application that applies noise may cause damage.
Provide separate countermeasures for surge applied to the power cable.

■ When installing the product, hold the body section so that impact is not applied to the body and excessive stress is not applied to the lead wire.

■ Do not disassemble or dismantle the product. Disassembling it may cause the parts to be ejected when heated.

■ The degree of protection is equivalent to IP40. Avoid dripping water or oil, etc., during use.

■ Do not rotate or oscillate the pressure sensor assembly.

How to replace pressure sensor

[Removal]
1. Pull out the fixing pins using a tool with a narrow tip.
2. Pull out the pressure sensor assembly.
3. Remove the O-ring. (Note that the O-ring may be fixed on the rear side of the pressure sensor)

[Mounting]
1. Insert a new O-ring to the sensor adapter.
2. Confirm that there is no debris, etc., on the O-ring, and then re-assemble it to the original position.
3. Pull on the pressure sensor assembly to confirm that it is properly installed.

■ Pay careful attention when pulling out the fixing pins. Hitting against other parts of the body or applying impact on the sensor may cause damage.