Low Profile
2/3-Port Solenoid Valve

Compact

Overall length
- 2-port: Approx. 38 mm
- 3-port: 54 mm

Valve width/height
- 10 mm

Weight
- 2-port: 10 g
- 3-port: 20 g

Large flow rate

<table>
<thead>
<tr>
<th></th>
<th>2-port/N.C.</th>
<th>3-port</th>
</tr>
</thead>
<tbody>
<tr>
<td>C (dm³/(s·bar))</td>
<td>0.25</td>
<td>0.5</td>
</tr>
<tr>
<td>Flow rate [L/min (ANR)]</td>
<td>45*1</td>
<td>90*1</td>
</tr>
</tbody>
</table>

*1 At 0.2 MPa

Application example

Air blow/Sorting

For various industries!

Blood pressure measuring device
Portable oxygen concentrator
Chip mounter
Pneumatic massaging device

(For use in medical equipment, please contact your SMC sales representative.)

SX90/090 Series

(SMC)

CAT.ES70-59A
Relationship Between Flow Rate and Pressure Difference

(Representative values)

Flow rate [L/min (ANR)] vs. Pressure difference [MPa]

- SX090
- SX91
- SX92

Flow rate is measured when the pressure difference is 0.2 MPa. Please refer to the graph below for the relationship between the flow rate and pressure difference.

Specifications

- Model: SX91, SX92, SX090
- Valve construction: 2-port direct operated poppet valve, 2-port direct operated poppet valve, 3-port direct operated poppet valve
- Type of actuation: Normally closed, Universal
- Fluid: Air, Nitrogen
- Operating pressure range [MPa]: −100 kPa to 0.2
- Proof pressure [MPa]: 0.6
- Ambient and fluid temperatures [°C]: 0 to 50
- G [dm³/(s·bar)]: 0.25, 0.12, 0.5
- Cv: 0.07, 0.032, 0.14
- b: 0.25, 0.25, 0.3
- Flow rate [L/min (ANR)] at 0.2 MPa: 45, 22, 90
- Response time [msec]: ON, OFF: 10 or less, ON, OFF: 15 or less
- Impact/Vibration resistance [m/s²]: 150/30
- Mounting orientation: Unrestricted
- Enclosure: IP40
- Weight [g]: 10, 20
- Electric specifications
  - Inrush [V]: 5 VDC (Rated 42%)/0.7 W
  - Holding voltage/Power consumption
    - 2-port valve: 5 VDC, 0.7 W
    - 3-port valve: 10 VDC, 0.7 W
  - Holding voltage/Power consumption: 5 VDC (Rated 42%)/0.7 W, 10 VDC (Rated 42%)/0.7 W
  - Holding voltage/Power consumption: 4.2 VDC (Rated 35%)/0.8 W, 8.4 VDC (Rated 35%)/0.8 W
  - Allowable voltage fluctuation [%]: ±10% of rated voltage (0 to +10%)
  - Type of coil insulation: Class B

How to Order

1. Type of actuation
   - 1: Normally closed
   - 2: Universal
2. Power-saving circuit
   - 1: Without power-saving circuit
   - 2: With power-saving circuit
3. Rated voltage
   - 5: 24 VDC
   - 6: 12 VDC
4. Electrical entry
   - G: Grommet (Lead wire length: 300 mm)

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Low Profile 2/3-Port Solenoid Valve SX90/090 Series

Dimensions

2-port
SX91/Normally closed
SX92/Universal

3-port
SX090/Universal

Continuous Energization

1. For the solenoid valve without power-saving circuit, continuous energization is not allowed at the start-up voltage (rated voltage) as there is a risk of damaging the coil. For continuous energization with the holding voltage, please make sure the coil surface temperature does not exceed 80°C.

2. Coil temperature may get high due to ambient temperature or energizing duration. Do not touch the valve by hand directly. When there is such a dangerous case to be touched by hands directly, install a protective cover.

3. When using the solenoid valves on a manifold, note that the temperature rise will be larger if three or more adjacent valves are energized together. Please ensure that the coil surface temperature does not exceed 80°C in the actual operating conditions.

Manual Override

1. To operate the manual override to the ON position, press the button fully in the direction of the arrow (approximately 0.5 mm). The valve will be turned OFF when the button is released. (For 3-port valve)

Valve Mounting

1. Confirm that the gasket is correctly mounted on the body interface and then tighten the screws to the specified torque. (Fasten equally so that the valve will not tilt.) The specified torque is from 0.10 to 0.14 N-m, please apply a torque setting depending on the base condition and operating environment.

2. Please do not apply force to the coil and frame when installing the piping and valves. If they receive 10 N or more of force, a malfunction may occur.

3. Do not pull the lead wire with excessive force. Applying 10 N or more of load may result in broken wire or contact failure.

Specific Product Precautions

Caution

1. Confirm that the gasket is correctly mounted on the body interface and then tighten the screws to the specified torque. (Fasten equally so that the valve will not tilt.) The specified torque is from 0.10 to 0.14 N-m, please apply a torque setting depending on the base condition and operating environment.

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Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\(^1\), and other safety regulations.

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

1) ISO 4414: Pneumatic fluid power – General rules relating to systems.

ISO 4413: Hydraulic fluid power – General rules relating to systems.

IEC 60204-1: Safety of machinery – Electrical equipment of machines.


ISO 10218-1: Manipulating industrial robots – Safety. etc.

Caution:

**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

Warning:

**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

Danger:

**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

### Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.