3 Port Solenoid Valve

**Power consumption 0.1 W (with power saving circuit)**

Coil temperature rises: only 1°C (with power saving circuit)

**Sonic conductance**

<table>
<thead>
<tr>
<th>Series</th>
<th>C: 0.037 (Standard)</th>
<th>C: 0.076 (Large flow capacity)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C (dm³/(s-bar))</td>
<td>b</td>
</tr>
<tr>
<td>Standard</td>
<td>V1□4</td>
<td>0.037</td>
</tr>
<tr>
<td>Large flow capacity</td>
<td>V1□4A</td>
<td>0.076</td>
</tr>
</tbody>
</table>

**Variations**

<table>
<thead>
<tr>
<th>Series</th>
<th>Type of actuation</th>
<th>Operating pressure range (MPa)</th>
<th>Power consumption (W)</th>
<th>With power saving circuit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td></td>
<td></td>
<td>Standard</td>
<td>0.35</td>
</tr>
<tr>
<td>V114</td>
<td></td>
<td>0 to 0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V124</td>
<td></td>
<td>0 to 0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large flow capacity</td>
<td></td>
<td></td>
<td>Power consumption (W)</td>
<td>With power saving circuit</td>
</tr>
<tr>
<td>V114A</td>
<td></td>
<td>0 to 0.7</td>
<td>1</td>
<td>—</td>
</tr>
<tr>
<td>V124A</td>
<td></td>
<td>0 to 0.7</td>
<td>1</td>
<td>—</td>
</tr>
</tbody>
</table>
# Rubber seal
## 3 Port Solenoid Valve/Direct Operated
### Series V100

#### Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air</td>
</tr>
<tr>
<td>Ambient and fluid temperature (°C)</td>
<td>-10 to 50 (No freezing. Refer to page 10.)</td>
</tr>
<tr>
<td>Response time (ms), Note 1)</td>
<td>ON: 5 or less, OFF: 4 or less</td>
</tr>
<tr>
<td>Max. operating frequency (Hz)</td>
<td>20</td>
</tr>
<tr>
<td>Manual override</td>
<td>Non-locking push, Locking slotted</td>
</tr>
<tr>
<td>Lubrication</td>
<td>Not required</td>
</tr>
<tr>
<td>Mounting position</td>
<td>Unrestricted</td>
</tr>
<tr>
<td>Impact/Vibration resistance (m/s²), Note 2)</td>
<td>150/30</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Dust proof, equivalent IP40</td>
</tr>
</tbody>
</table>

*Note 1: Based on dynamic performance test JIS B8374-1981 (standard type: at coil temperature of 20°C, with rated voltage, without surge voltage suppressor)*

*Note 2: Impact resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed one time each in the axial and right angle directions of the main valve and armature, for both energized and de-energized states. (Value in the initial stage)

Vibration resistance: No malfunction resulted in 45 to 2000 Hz, a one-sweep test performed in the axial and right angle directions of the main valve and armature for both energized and de-energized states. (Value in the initial stage)

#### Solenoid Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td>V114/V124</td>
</tr>
<tr>
<td></td>
<td>V114A/V124A</td>
</tr>
<tr>
<td>Electrical entry</td>
<td>Grommet (G)/(H), L plug connector(L)</td>
</tr>
<tr>
<td></td>
<td>M plug connector (M)</td>
</tr>
<tr>
<td>Coil rated voltage (V)</td>
<td>DC</td>
</tr>
<tr>
<td></td>
<td>24, 12, 6, 5, 3</td>
</tr>
<tr>
<td>Allowable voltage fluctuation</td>
<td>-10 to 10%</td>
</tr>
<tr>
<td>Power consumption (W)</td>
<td>DC</td>
</tr>
<tr>
<td></td>
<td>Standard: 0.35 (with light: 0.4)</td>
</tr>
<tr>
<td></td>
<td>With power saving circuit 0.1</td>
</tr>
<tr>
<td></td>
<td>1 W (with light: 1.1)</td>
</tr>
<tr>
<td>Surge voltage suppressor</td>
<td>Refer to page 14.</td>
</tr>
<tr>
<td>Indicator light</td>
<td>LED</td>
</tr>
</tbody>
</table>
Specifications

<table>
<thead>
<tr>
<th>Valve model</th>
<th>Type of actuation</th>
<th>Model</th>
<th>Operating pressure range (MPa)</th>
<th>Vacuum specification (MPa)</th>
<th>Port size</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V114</td>
<td>N.C.</td>
<td>Standard</td>
<td>0 to 0.7</td>
<td>-100 kPa to 0.6</td>
<td>Port 1 M5</td>
<td>M5</td>
</tr>
<tr>
<td>V114A</td>
<td>N.C.</td>
<td>Large flow capacity</td>
<td>0 to 0.7</td>
<td>-100 kPa to 0.6</td>
<td>Port 3 M5</td>
<td>M5</td>
</tr>
<tr>
<td>V124</td>
<td>N.C.</td>
<td>Standard</td>
<td>0 to 0.7</td>
<td>-100 kPa to 0.6</td>
<td>Ports 1,3 M5</td>
<td>M5</td>
</tr>
<tr>
<td>V124A</td>
<td>N.C.</td>
<td>Large flow capacity</td>
<td>0 to 0.7</td>
<td>-100 kPa to 0.6</td>
<td>Port 2 M5</td>
<td>M5</td>
</tr>
</tbody>
</table>

Flow characteristics

<table>
<thead>
<tr>
<th>1→2</th>
<th>3→</th>
<th>2→3</th>
</tr>
</thead>
<tbody>
<tr>
<td>C[dm³/(s•bar)]</td>
<td>b</td>
<td>Q[l/min]</td>
</tr>
<tr>
<td>V114</td>
<td>0.037</td>
<td>0.11</td>
</tr>
<tr>
<td>V114A</td>
<td>0.076</td>
<td>0.070</td>
</tr>
<tr>
<td>V124</td>
<td>0.054</td>
<td>0.35</td>
</tr>
<tr>
<td>V124A</td>
<td>0.099</td>
<td>0.23</td>
</tr>
</tbody>
</table>

Note 1) For both V124, V124A, pressure from port 3 and exhaust from port 1.

Note 2) The values shown in ( ) are for values with sub-plate.

Construction

V114(A) V124(A)

Component Parts

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Resin</td>
</tr>
<tr>
<td>2</td>
<td>Cover</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>3</td>
<td>Push rod</td>
<td>Resin</td>
</tr>
<tr>
<td>4</td>
<td>Armature assembly</td>
<td>Stainless steel, Resin</td>
</tr>
<tr>
<td>5</td>
<td>Poppet</td>
<td>FKM</td>
</tr>
<tr>
<td>6</td>
<td>Return spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>7</td>
<td>Poppet spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>8</td>
<td>Coil assembly</td>
<td>—</td>
</tr>
<tr>
<td>9</td>
<td>Manual override</td>
<td>Resin</td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>No.</th>
<th>Material</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Gasket assembly</td>
<td>V100-31-1A</td>
<td>FKM, Steel</td>
<td>Gasket, 2 screws</td>
</tr>
<tr>
<td>11</td>
<td>Sub-plate</td>
<td>V100-74-1</td>
<td>Aluminum die-cast</td>
<td>—</td>
</tr>
</tbody>
</table>

How to Order Connector Assembly

For DC: SY100 – 30 – 4A –

Without lead wire: SY100 – 30 – A

Lead wire length

<table>
<thead>
<tr>
<th>Lead wire length</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>300 mm</td>
</tr>
<tr>
<td>6</td>
<td>600 mm</td>
</tr>
<tr>
<td>10</td>
<td>1000 mm</td>
</tr>
<tr>
<td>15</td>
<td>1500 mm</td>
</tr>
<tr>
<td>20</td>
<td>2000 mm</td>
</tr>
<tr>
<td>25</td>
<td>2500 mm</td>
</tr>
<tr>
<td>30</td>
<td>3000 mm</td>
</tr>
<tr>
<td>50</td>
<td>5000 mm</td>
</tr>
</tbody>
</table>
Series V100

How to Order

Standard

<table>
<thead>
<tr>
<th>Base mounted</th>
<th>V1</th>
<th>1</th>
<th>4</th>
<th>5</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 port</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Type of actuation

<table>
<thead>
<tr>
<th></th>
<th>Normally closed</th>
<th>Normally open</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Type of actuation

Coil specification

<table>
<thead>
<tr>
<th>Nil</th>
<th>0.35 W</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>0.1 W (with power saving circuit)</td>
</tr>
</tbody>
</table>

(24 VDC, 12 VDC only)

* All the types with power saving circuit are with light/surge voltage suppressor.

Rated voltage

For DC

<table>
<thead>
<tr>
<th>5</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>12 VDC</td>
</tr>
<tr>
<td>V</td>
<td>6 VDC</td>
</tr>
<tr>
<td>S</td>
<td>5 VDC</td>
</tr>
<tr>
<td>R</td>
<td>3 VDC</td>
</tr>
</tbody>
</table>

Port size

N: Without sub-plate
M: With sub-plate

(With gasket and screws)

Manual override

N: Non-locking push
B: Locking slotted

Electrical entry

G: 300 mm lead wire
H: 600 mm lead wire

Grommet L plug connector M plug connector

M: 300 mm lead wire

MN: Without lead wire

Indicating light and surge voltage suppressor

<table>
<thead>
<tr>
<th>Nil</th>
<th>Without indicator light or surge voltage suppressor</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>With surge voltage suppressor</td>
</tr>
<tr>
<td>Z</td>
<td>With indicator light and surge voltage suppressor</td>
</tr>
<tr>
<td>R</td>
<td>With surge voltage suppressor (Non-polar)</td>
</tr>
<tr>
<td>U</td>
<td>With indicator light and surge voltage suppressor (Non-polar)</td>
</tr>
</tbody>
</table>

* Only “Z” is available for the types with power saving circuit.

* LN and MN types are with 2 sockets.
3 Port Solenoid Valve  Series V100

How to Order

<table>
<thead>
<tr>
<th>Base mounted</th>
<th>V1 1 4 A 5 M</th>
</tr>
</thead>
</table>

- **Type of actuation**
  - 1: Normally closed
  - 2: Normally open

- **High flow capacity**

- **Port size**
  - Nil: Without sub-plate
  - M5: With sub-plate

- **Rated voltage**
  - For DC
    - 5: 24 VDC
    - 6: 12 VDC
    - V: 6 VDC
    - S: 5 VDC
    - R: 3 VDC

- **Electrical entry**
  - G: 300 mm lead wire
  - L: 300 mm lead wire
  - M: 300 mm lead wire
  - MN: Without lead wire
  - LN: Without lead wire
  - LO: Without connector
  - MO: Without connector

- **Indicator light and surge voltage suppressor**
  - Nil: Without indicator light or surge voltage suppressor
  - R: With surge voltage suppressor
  - U: With indicator light and surge voltage suppressor

- **Manual override**
  - Nil: Non-locking push
  - B: Locking slotted

- **Large flow**

- **For sub-plate style, For manifold type S41**

- **For DC, AC**

- **Note:** LN and MN types are with 2 sockets.
Series V100

Base Mounted (With sub-plate)

Note) [  ]: values for large flow type (A).

Grommet (G), (H): V1\text{1} 4(A)-G\text{□}H\text{□}-M5

- Other dimensions are same as grommet style.

L plug connector (L): V1\text{1} 4(A)-L\text{□}M\text{□}-M5

- Other dimensions are same as grommet style.

M plug connector (M): V1\text{1} 4(A)-M\text{□}M\text{□}-M5

- Other dimensions are same as grommet style.
3 Port Solenoid Valve
Series V100
Manifold Specifications

Manifold Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Type S41</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manifold</td>
<td>Single base style/B mount</td>
</tr>
<tr>
<td>P (SUP)/R (EXH) style</td>
<td>Common SUP/Common EXH</td>
</tr>
<tr>
<td>Valve stations</td>
<td>2 to 20 stations</td>
</tr>
<tr>
<td>Output port porting specifications</td>
<td>Location: Base, Direction: Side</td>
</tr>
<tr>
<td>Port size</td>
<td>1, 2, 3 port M5</td>
</tr>
</tbody>
</table>

Note 1) V114(A) and V124(A) cannot be mounted onto the same manifold.
Note 2) For V124(A), pressure from port 3 and exhaust from port 1.

Flow Characteristics

<table>
<thead>
<tr>
<th>Manifold</th>
<th>Port size</th>
<th>Flow characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type VV100-S41</td>
<td>M5 x 0.8</td>
<td></td>
</tr>
<tr>
<td>V114</td>
<td>0.032</td>
<td>0.0072</td>
</tr>
<tr>
<td>V114A</td>
<td>0.070</td>
<td>0.016</td>
</tr>
<tr>
<td>V124</td>
<td>0.050</td>
<td>0.012</td>
</tr>
<tr>
<td>V124A</td>
<td>0.085</td>
<td>0.020</td>
</tr>
</tbody>
</table>

Note) Values when manifold base (5 stations) is mounted.

How to Order Valve Manifold Assembly (Example)

Ordering example

Valve (N.C.)
V114-5GZ

Manifold base (5 stations)
VV100-S41-05-M5
Blank plate assembly
V100-77-1A

VV100-S41-05-M5 ....... 1 set (Type S41, 5 station manifold base part no.)
*V100-77-1A .......... 1 set (Blank plate assembly number)
*V114-5GZ ............. 4 sets (Valve)
*To order valves and options mounted onto the manifold at the factory, list the valve/option with an asterisk (*) in front of each part number.

List part numbers of the installed valve and option in required station location separately under manifold part number.
Common SUP/Common EXH

Type S41

How to Order

VV100 – S41 – 05 – M5

Stations

02 2 stations
:
:
20 20 stations

2 port size

M5 M5

Applicable solenoid valve

Note)

Note) V114(A) and V124(A) cannot be mounted to the same manifold.

Gasket assembly - Replacement part

Part-No. V100-31-1A

Round head combination screw
(M2 x 14, flat nickel plated)

Applicable base
• Sub-plate
• Type VV100-S41 manifold base

Blank plate assembly - Accessory

Part-No. V100-77-1A

Place notch mark on the blank plate to 2 port side when assembling.

Round head combination screw
(M2 x 7, flat nickel plated)

Notch mark

Blanking plate

Gasket

Applicable base
• Sub-plate
• Type VV100-S41 manifold base

Caution

Mounting screw tightening torques
M2: 0.12 N·m
Manifold type S41: Side ported/VV100-S41-[Stations]-M5

Grommet (G), (H)

Note) [ ]: values for large flow type (A).

L plug connector (L)

M plug connector (M)

* Other dimensions are same as grommet style.
Formula for calculating the weight of the manifolds without valves:
Weight (g) = 7 + 9*n; (n = number of stations)
Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO 4414 \(^{1}\), JIS B 8370 \(^{2}\) and other safety practices.

⚠️ **Caution**: Operator error could result in injury or equipment damage.

⚠️ **Warning**: Operator error could result in serious injury or loss of life.

⚠️ **Danger**: In extreme conditions, there is a possible result of serious injury or loss of life.

---

Note 1) ISO 4414: Pneumatic fluid power – General rules relating to systems
Note 2) JIS B 8370: Pneumatic system axiom

---

**Warning**

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

   Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalogue information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. **Only trained personnel should operate pneumatically operated machinery and equipment.**

   Compressed air can be dangerous if handled incorrectly. Assembly, handling or maintenance of pneumatic systems should be performed by trained and experienced operators.

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

   1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driven object have been confirmed.
   2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
   3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc.

4. **Contact SMC if the product is to be used in any of the following conditions:**

   1. Conditions and environments beyond the given specifications, or if product is used outdoors.
   2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
   3. An application which has the possibility of having negative effects on people, property, or animals, and therefore requires special safety analysis.
3 Port Solenoid Valve/Common Precautions 1
Be sure to read before handling.

### Design

⚠️ **Warning**

1. **Actuator drive**
   When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures to prevent potential danger caused by actuator operation.

2. **Effect of back pressure when using a manifold**
   Use caution when the valves are used on a manifold, as actuator malfunction due to back pressure may occur. Special caution is also necessary when driving a single acting cylinder. Take additional care in cases where there is a danger of malfunction due to this potential back-pressure.

3. **Holding pressure (including vacuum)**
   Since valves are subject to air leakage, they cannot be used for applications such as holding pressure (including vacuum) in a pressure vessel.

4. **The valve cannot be used as an emergency shutoff valve, etc.**
   The valves presented in this catalogue are not designed for safety applications such as an emergency shutoff valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

5. **Maintenance space**
   The installation should allow sufficient space for maintenance activities (removal of valve, etc.).

6. **Release of residual pressure**
   Provide a residual pressure release function for maintenance purposes.

7. **Vacuum applications**
   When a valve is used for vacuum switching, take appropriate measures against the suction of external dust or other contaminants through vacuum pads and exhaust ports.

8. **Ventilation**
   When a valve is used inside a sealed control panel, etc., provide ventilation to prevent a pressure increase caused by exhausted air inside the control panel or temperature rise caused by the heat generated by the valve.

### Selection

⚠️ **Warning**

1. **Confirm the specification.**
   The products presented in this catalogue are designed only for use in compressed air systems (including vacuum). Do not operate at pressures or temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction. (Refer to specifications.)
   Contact SMC when using a fluid other than compressed air (including vacuum).

2. **Extended periods of continuous energization**
   - If a valve is continuously energized for long periods, heat generation of the coil may result in reduced performance and shorter service life. This may also have an adverse effect on the peripheral equipment in proximity. Should a valve be continuously energized for long periods, or its daily energized state exceeds its non energized state, please use an energy saving type valve with DC specifications. Under some operating conditions, alternative valves from those detailed above can be used (for example, valves with DC specifications). For more information, please consult SMC. It is also possible to avoid potential problems by shortening the energization time and using the valve as a N.O. (normally open) type.
   - When solenoid valves are mounted in a control panel, employ measures to radiate excess heat, so that temperatures remain within the valve specification range. Use special caution when three or more stations sequentially aligned on the manifold are continuously energized since this will cause a drastic temperature rise.

⚠️ **Caution**

1. **Leakage voltage**
   When using a resistor in parallel with the switching element or using a C-R element (surge voltage suppressor) for protection of the switching element, note that leakage voltage will increase due to leakage current flowing through the resistor or C-R element. Limit the amount of residual leakage voltage to the following value:
   - **DC coil**: 3% or less of the rated voltage

2. **Surge voltage suppressor**
   If a surge protection circuit contains non-ordinary diodes such as Zener diodes or ZNRs, a residual voltage that is in proportion to the protective elements and the rated voltage will remain. Therefore, give consideration to surge voltage protection of the controller. In the case of diodes, the residual voltage is approximately 1 V.

3. **Low temperature operation**
   Take appropriate measures to avoid freezing of drainage, moisture, etc. Valve use is still possible to temperature extremes of −10°C, unless there are specific instructions on the valve.

4. **Mounting orientation**
   The mounting orientation is unrestricted.
3 Port Solenoid Valve/Common Precautions 2
Be sure to read before handling.

**Warning**

1. **If air leakage increases or equipment does not operate properly, stop operation.**
   Check mounting conditions when air and power supplies are connected. Initial function and leakage tests should be performed after installation.

2. **Instruction manual**
   Mount and operate the product after reading the manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

3. **Painting and coating**
   Warnings or specifications printed or pasted on the product should not be erased, removed or covered up. Consult SMC if paint is to be applied to resinous parts, as this may have an adverse effect due to the paint solvent.

**Caution**

1. **Preparation before piping**
   Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

2. **Wrapping of sealant tape**
   When connecting pipes and fittings, etc., be sure chips from the pipe threads and sealing material do not get inside the valve. Furthermore, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

3. **Screwing in fitting**
   When screwing fittings into valves, tighten as follows.
   1) **M5**
   (1) When installing SMC fittings, etc., follow the procedures below.
   After tightening by hand, tighten an additional 1/6 rotation for M5 with a tool. However, when using a miniature fitting, tighten an additional 1/4 rotation with a tool after tightening by hand. Also, when there are 2 gaskets such as in case of a universal elbow or universal tee, tighten an additional 1/2 rotation.
   Note) If overtightened, threaded part may be broken or gasket deformed. If tightened insufficiently, thread part may be loosened. In either case, air leakage could occur.
   (2) When using a fitting brand other than SMC, follow the instruction by the manufacturer of the fittings.

4. **Connection of piping to products**
   When connecting piping to a product, refer to its instruction manual to avoid mistakes regarding the supply port, etc.

**Piping**

**Wiring**

**Lubrication**

1. **Lubrication**
   1) The valve has been lubricated for life at the manufacturer, and does not require any further lubrication.
   2) If a lubrication is applied in the system, use turbine oil Class 1 (no additive), ISO VG32. However, once lubrication is applied it must be continued, as loss of the original lubricant may lead to malfunction.
3 Port Solenoid Valve/Common Precautions 3
Be sure to read before handling.

### Air Supply

**Warning**
1. Use clean air.
   Do not use compressed air which contains chemicals, synthetic oils containing organic solvents, salts or corrosive gases, etc., as this can cause damage or malfunction.

**Caution**
1. Install air filters.
   Install air filters close to valves at their upstream side. A filtration degree of 5 µm or less should be selected.
2. Install an air dryer, after cooler or Drain Catch, etc.
   Air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an air dryer, after-cooler or water separator, etc.
3. If excessive carbon powder is seen, install a mist separator on the upstream side of the valve.
   If excessive carbon dust is generated by the compressor, it may adhere to the inside of valves and cause malfunction. Refer to “SMC Best Pneumatic” catalogue vol. 4 for compressed air quality.

### Operating Environment

**Warning**
1. Do not use in atmospheres where the valve is in direct contact with corrosive gases, chemicals, salt water, water or steam.
2. Do not use in an explosive atmosphere.
3. Do not use in locations subject to vibration or impact. Confirm the specifications in the main section of the catalogue.
4. Use a protective cover, etc., to shield valves from direct sunlight.
5. Shield valves from radiated heat generated by nearby heat sources.
6. Employ suitable protective measures in locations where there is contact with oil or welding spatter, etc.
7. When solenoid valves are mounted in a control panel or are energized for extended periods of time, employ measures to radiate excess heat, so that temperatures remain within the valve specification range.

### Maintenance

**Warning**
1. Perform maintenance procedures as shown in the instruction manual.
   If handled improperly, malfunction or damage of machinery or equipment may occur.
2. Removal of equipment and supply/exhaust of compressed air
   When equipment is serviced, first confirm that measures are in place to prevent dropping of work pieces and run-away of equipment, etc. Then cut the supply pressure and power, and exhaust all compressed air from the system using its residual pressure release function. When the equipment is to be started again after remounting or replacement, first confirm that measures are in place to prevent lurching of actuators, etc., and then confirm that the equipment is operating normally.
3. Low frequency operation
   Valves should be switched at least once every 30 days to prevent malfunction. (Use caution regarding the air supply.)
4. Manual override operation
   When the manual override is operated, connection equipment will be actuated. Start the operation after confirming its safety.

**Caution**
1. Drain flushing
   Remove drainage from air filters regularly.
2. Lubrication
   Lubricate turbine oil Class 1 (no additives), VG32. If other lubricant oil is used, it may cause malfunction. Contact us for suggested turbine oil Class 2(with additive), VG32.
3. Attaching and detaching lead wires with sockets

- **Attaching**
  Insert the sockets into the square holes of the connector (indication), and continue to push the sockets all the way in until they lock by hooking into the seats in the connector. (When they are pushed in, their hooks open and they are locked automatically.) Then confirm that they are locked by pulling lightly on the lead wires.

- **Detaching**
  To detach a socket from a connector, pull out the lead wire while pressing the socket's hook with a stick having a thin tip (about 1 mm). If the socket will be used again, first spread the hook outward.

### Manual Override Operation

**Warning**

**Non-locking push style**

Press in the direction of the arrow.

**Locking slotted style [B]**

Turn in the direction of arrow.

**Caution**

When operating with a screw driver, turn it gently using a watchmaker's screw driver. [Torque: less than 0.1Nm]

### How to Use Plug Connector

1. **Attaching and detaching connectors**
   - To attach a connector, hold the lever and connector unit between your fingers and insert straight onto the pins of the solenoid valve so that the lever's pawl is pushed into the groove and locks.
   - To detach a connector, remove the pawl from the groove by pushing the lever downward with your thumb, and pull the connector straight out.

2. **Crimping of lead wires and sockets**
   Strip 3.2 to 3.7 mm at the end of the lead wires, insert the ends of the core wires evenly into the sockets, and then crimp with a crimping tool. When this is done, take care that the coverings of the lead wires do not enter the core wire crimping area.
   Use a special tool when crimping. (Consult SMC for the crimping tool.)

### Plug Connector Lead Wire Length

Standard length is 300 mm, but the following length is also available.

#### How to Order Connector Assembly

For DC: SY100-30-4A

Without lead wire: SY100-30-A

(with connector and 2 pcs. of socket)

<table>
<thead>
<tr>
<th>Lead wire length</th>
<th>300 mm</th>
<th>600 mm</th>
<th>1000 mm</th>
<th>1500 mm</th>
<th>2000 mm</th>
<th>2500 mm</th>
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</table>
Series V100/Specific Product Precautions 2
Be sure to read before handling.
Refer to pages 9 through 12 for safety instructions, precautions.

Surge Voltage Suppressor

<For DC> Grommet, L and M plug connector

- **Standard style (With polarity)**
  With surge voltage suppressor (S)
  
  ![Diagram of surge voltage suppressor]

  Red (+) <br>
  Black (-)

  Indicator light and surge voltage suppressor (I)

  Red (+) <br>
  Black (-)

- **Non-polar style**
  With surge voltage suppressor (R)
  
  ![Diagram of surge voltage suppressor]

  (+) (+) <br>
  (-) (-)

  Indicator light and surge voltage suppressor (U)

  (+) (+) <br>
  (-) (-)

- **With power saving circuit**
  
  Electric circuit (with power saving circuit)
  
  ![Diagram of electric circuit]

  LED <br>
  Diode <br>
  Coi

  (1: Starting current, 2: Holding current)

- Please connect correctly the lead wires to + (positive) and – (negative) indications on the connector.
- For DC voltages other than 12, 24 VDC, incorrect wiring will cause damage to the surge voltage suppressor circuit since a diode to prevent reverse current is not provided. (Wrong polarity will cause trouble.)
- Solenoids, whose lead wires have been pre-wired: positive side red and negative side black.

**Operating principle**

The electrical circuit as shown above, allows reduced holding current consumption and measures power saving. Refer to the electric waveform on the right.

Connecter Assembly with Cover

Connector assembly with protective cover enhances dust protection

- Effective in preventing possible short circuit problems due to contaminants in contact with connector section.
- Cover material is chloroprene rubber which has excellent weatherability and electric insulation properties. However, be careful not to allow contact with cutting oil, etc.
- Round cord provides neat appearance.

**How to Order**

**SY100 – 68 – A**

- **Lead wire length (L)**
  
<table>
<thead>
<tr>
<th>Length (mm)</th>
<th>SY100-68-A-20</th>
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<tbody>
<tr>
<td>300</td>
<td>V114-5LOZ-M5</td>
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<td>600</td>
<td>V114-5LOZ-M5</td>
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<tr>
<td>5000</td>
<td>V114-5LOZ-M5</td>
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</tbody>
</table>

**Connector Assembly with Cover/Dimensions**

- How to Order
  Indicate part number of connector assembly with cover in addition to the solenoid valve part number without connector of the plug connector.
  <Example 1> Lead wire length: 2000 mm  
  V114-5LOZ-M5  
  SY100-68-A-20
  <Example 2> Lead wire length: 300 mm (Standard)  
  V114-5LPZ-M5

- Symbol of connector assembly with protective cover
  
  No part numbers of connector assembly with cover are needed to be indicated in this case.