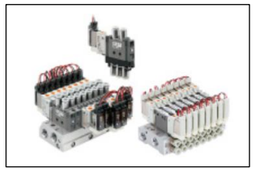
ORIGINAL INSTRUCTIONS

Instruction Manual
5 Port Solenoid Valve
Series S0700



The intended use of this valve is to control the movement of an actuator.

1 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) 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. (Part 1: General requirements)
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

⚠ 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.

⚠ Warning

- **Always ensure compliance with relevant safety laws and standards.**
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

⚠ Caution

- The product is provided for use in manufacturing industries only. Do not use in residential premises.

2 Specifications

2.1 Valve specifications

Valve construction		Rubber seal
Fluid		Air
Maximum operating pressure [MPa]		0.7
Minimum operating pressure [MPa]		0.2
Ambien and fluid temperature [˚C] Note 1)		-10 to 50 (no freezing)
Flow rate characteristics		Refer to catalogue
Response time		
Duty cycle		Contact SMC
Minimum operating frequency [Hz]		1 cycle / 30 days
Maximum operating frequency [Hz]		5
Pilot valve manual override		Push type
Lubrication		Not required
Impact/Vibration resistance [m/s^2] Note 2)		100 / 30
Enclosure (based on IEC60529)		IP40
Mounting orientation		Unrestricted
Pilot valve exhaust method Note 3)	Plug lead type	Individual exhaust
	Slim compact bar base	Common exhaust
	Plug-in type stacking base	

2 Specifications - continued

Noise reduction (built-in silencer) [dB] Note 4)	Plug-in type	30
	Plug lead type	20
Weight		Refer to catalogue

Table 1.

Note 1) Use dry air to prevent condensation when operating at low temperatures.
Note 2) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition.
Vibration resistance: No malfunction occurred in a one-sweep test between 8.3 and 2000 Hz. Test was performed at both energized and deenergized states in the axial direction and at the right angles to the main valve and armature.
Note 3) Valves with the external pilot specifications have a pilot EXH with individual exhaust specifications.
Note 4) Value may vary depending on pneumatic circuit or pressure.

2.2 Solenoid specifications

Electrical entry	Grommet (G), M type plug connector (M)
Coil rated voltage [VDC]	24, 12
Allowable voltage fluctuation	±10% of rated voltage
Coil insulation class	Class B or equivalent
Power consumption [W] (current [mA])	0.35 (15)
Surge voltage suppressor	Varistor
Indicator light	LED

Table 2.

2.3 Manifold specifications

2.3.1 Plug-in type

Model		SS0751-#	SS0750-#
Manifold type		Slim compact bar base	Plug-in type stacking base
Port size	1(P), 3(R)	C6, C8, N7, N9	
	4(A), 2(B)	C2, C3, C4, N1, N3	
Maximum valve stations	S kit	EX510: 16 stations	EX500: 16 stations
		EX180: 32 stations	EX250/260/600: 24 stations
	F kit	24 stations	
	P kit		
Maximum valve stations	T kit	-	20 stations
	L kit		24 stations
	M kit		

Table 3.

2.3.2 Plug lead type

Model		SS0752-##C	SS0755-#C#C	SS0755-#V#C
Manifold type		Body ported	Base mounted	
Manifold pitch [mm]		7.5	8.5	7.5
Port size	1(P), 3(R)	Rc1/8		M5
	4(A), 2(B)	C2, C4 N1, N3	M5, C2, C3, C4 N1, N3	M3 V2, V3, V4
Electrical entry		C kit	C kit / S kit (EX510)	C kit
Maximum valve stations		20	20 / 16	20

Table 4.

2.4 Pneumatic symbols

Refer to catalogue for pneumatic symbols.

2.5 Indicator light

2.5.1 Plug-in type

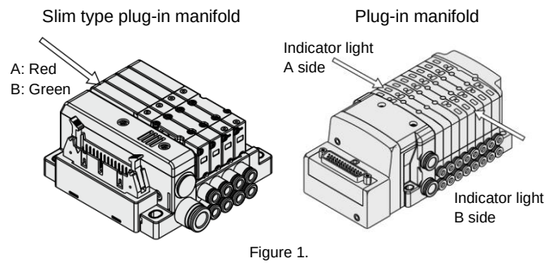


Figure 1.

2 Specifications - continued

2.5.2 Plug lead type

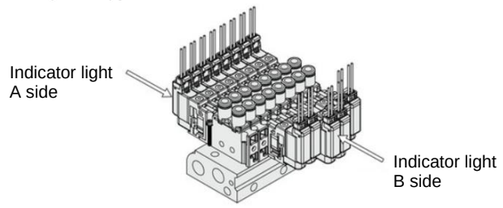


Figure 2.

2.6 Special products

⚠ Warning

Special products (-X) might have specifications different from those shown in this section. Contact SMC for specific drawings.

3 Installation

3.1 Installation

⚠ Warning

- Do not install the product unless the safety instructions have been read and understood.

3.2 Environment

⚠ Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product’s specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product’s specifications.

3.3 Piping

⚠ Caution

- Before connecting piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

Connection threads	Proper tightening torque [N·m]
M3	0.4 to 0.5
M5	1 to 1.5
1/8	3 to 5

Table 5.

3.4 Lubrication

⚠ Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, refer to catalogue for details.

3.5 Air supply

⚠ Warning

- Use clean air. If the compressed air supply includes chemicals, synthetic materials (including organic solvents), salinity, corrosive gas etc., it can lead to damage or malfunction.

⚠ Caution

- Install an air filter upstream of the valve. Select an air filter with a filtration size of 5 µm or smaller.

3.6 Manual override

⚠ Warning

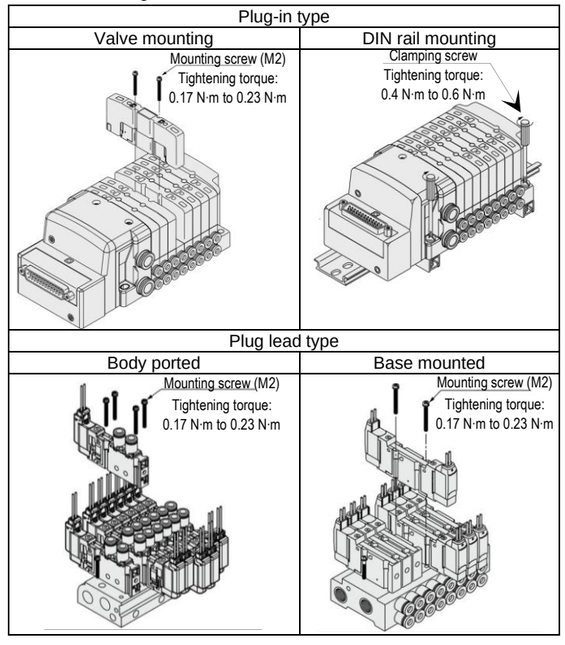
- Regardless of an electric signal for the valve, the manual override is used for switching the main valve. Since connected equipment will operate when the manual override is activated, confirm that conditions are safer prior to activation.
- Refer to the catalogue for details of manual override operation.

3.7 Mounting

⚠ Caution

3 Installation - continued

- Ensure gaskets are in good condition, not deformed and are dust and debris free.
- When mounting valves ensure gaskets are present, aligned and securely in place and tighten the screws to torque levels as per figures below.
- Refer to catalogue for additional information.



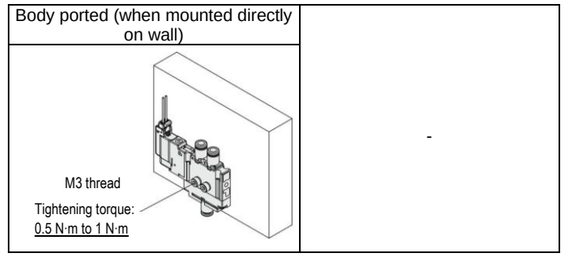


Figure 3.

3.8 Electrical circuits

⚠ Caution

Surge suppression should be specified by using the appropriate part number. If a valve type without suppression (Type ‘G’) is used, suppression must be provided by the host controller as close as possible to the valve.

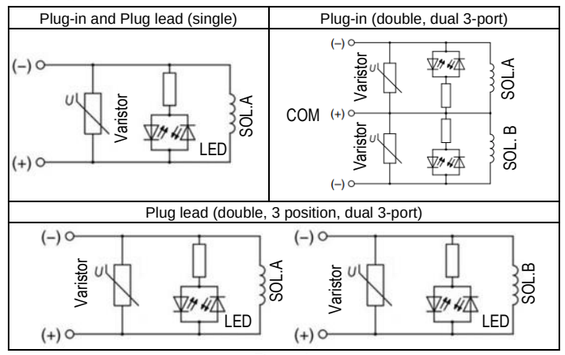


Figure 4.

3 Installation - continued

3.9 Residual voltage of the surge voltage suppressor

Caution

- The suppressor arrests the back EMF voltage from the coil to a level in proportion to the rated voltage.
- Ensure the transient voltage is within the specification of the host controller.
- In the case of varistor, the residual voltage is approximately 60 V.

3.10 Countermeasure for surge voltage

Caution

- At times of sudden interruption of the power supply, the energy stored in a large inductive device may cause non-polar type valves in a de-energized state to switch.
- When installing a breaker circuit to isolate the power, consider a valve with polarity (with polarity protection diode), or install a surge absorption diode across the output of the breaker.

3.11 How to attach / detach plug connector

Caution

Do not pull the lead wire excessively (with a force of 10 N or more) as the connector and cover might get damaged.

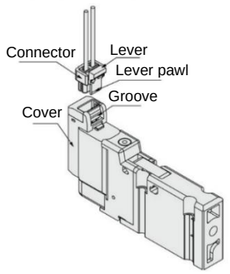


Figure 5.

3.12 Electrical wiring specifications

Caution

- The surge voltage created when the power supply is cut off could apply to the de-energized load equipment through the output circuit. In cases where the energized load equipment has a larger capacity (power consumption) and is connected to the same power supply as the product, the surge voltage could malfunction and/or damage the internal circuit element of the product and the internal device of the output equipment. To avoid this situation, place a diode which can suppress the surge voltage between the COM lines of the load equipment and output equipment.
- Refer to catalogue for electrical wiring specifications.

3.13 Changing connector entry direction (plug-in type only)

Caution

Refer to the Specific Product Precautions in the catalogue.

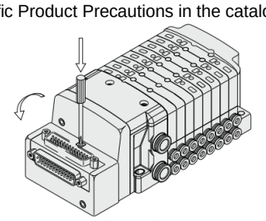


Figure 6.

3.14 Extended periods of continuous energization

Warning

If a valve will be continuously energized for an extended period of time, the temperature of the valve will increase due to the heat generated by the coil assembly. This will likely adversely affect the performance of the valve and any nearby peripheral equipment.

3.15 Effect of back pressure when using a manifold

Warning

Use caution when valves are used on a manifold because an actuator may malfunction due to back-pressure.

3 Installation - continued

3.16 Non- SMC tube brands

Caution

When using other than SMC brand tube, confirm that the tube outside diameter tolerance is satisfied. Refer to catalogue for additional information.

3.17 Connecting tubing

Refer to catalogue for additional information.

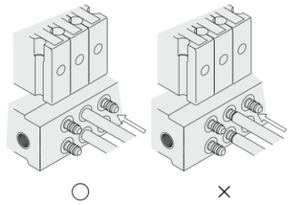


Figure 7.

4 How to Order

Refer to catalogue for 'How to Order' or to product drawing for special products.

5 Outline Dimensions

Refer to catalogue for outline dimensions.

6 Maintenance

6.1 General maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

6.2 Increase manifold stations (Plug-in type only)

- Refer to catalogue for details on how to increase connector type manifold stations.

Caution

- When assembling, tighten the hexagon bolts at the U-side end of the manifold to a recommended torque of 0.85 N·m to 0.95 N·m.

6.3 Replacement parts

Refer to catalogue for details regarding replacement parts such us blanking plate assembly, individual SUP/EXH spacer, individual SUP spacer, individual EXH spacer, SUP block plate, EXH block plate, back pressure check valve, blanking plate with output, port plug, DIN rail mounting bracket, DIN rail, blanking plug, silencer, name plate, dual flow fitting, SUP/EXH block, single and double check blocks.

6.3.1 Replacement of one-touch fittings

Caution

- Do not apply unnecessary forces such as twisting, pulling, moment loads, vibration and impact, etc. on fittings or tubing. A force of 20 N or more applied to the fitting and/or tube can cause damage to the valve and/or fitting, crushing, bursting, or detachment of tubing, or air leakage.
- Refer to catalogue for additional information.

6 Maintenance - continued

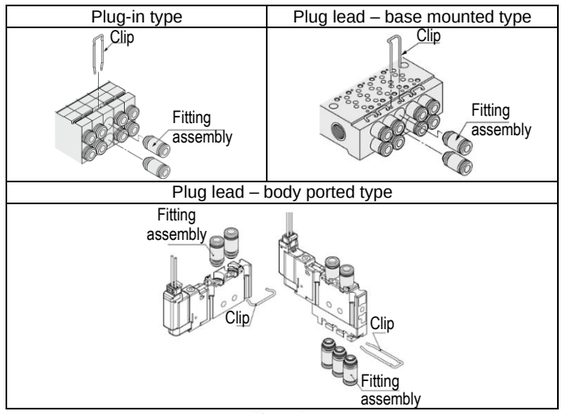


Figure 8.

6.4 Replacement of silencers

- Single body ported valve of the plug lead type and the plug-in type has built-in silencers.
- Dirty and clogged silencer may reduce cylinder speed or cause a malfunction. Replace the silencer periodically.
- Refer to catalogue for additional information.

6.4.1 Plug-in type

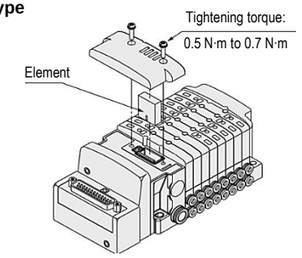


Figure 9.

6.4.2 Plug lead type (body ported valve)

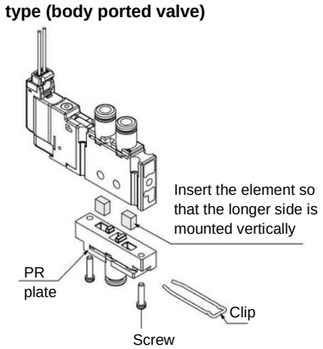


Figure 10.

6.5 Pilot valve replacement

Refer to catalogue for additional information.

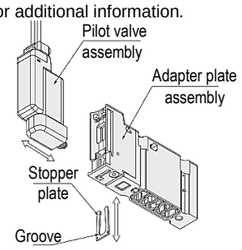


Figure 11.

7 Limitations of Use

7.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

Warning

7.2 Effect of energy loss on valve switching

- The use of 2-position single valves with air returned or air/spring returned spools has to be carefully considered.
- The return of the valve spool into the de-energized position depends on the pilot pressure. If the pilot pressure drops below the specified operating pressure the position of the spool cannot be defined.
- The design of the system must take into account such behaviour.
- Additional measures might be necessary. For example, the installation of an additional air tank to maintain the pilot pressure.

Energy source status	Single solenoid	Double solenoid	3 position	4 position (dual 3-port)
Air supply present, electrical supply cut	Spool returns to the OFF position by air force and spring force	Spool stops moving after electricity cut (Position cannot be defined)	Spool returns to the OFF position by spring force	Spool return to the OFF position by air force and spring force
Electrical supply present, air supply cut	Spool stops moving after air pressure cut (Position cannot be defined)			Spool stops moving after air pressure cut (Position cannot be defined)

Table 6.

Note) Applies to when the spool is at the end position and at an intermediate position.

7.3 Intermediate stopping

Refer to Handling Precautions for 3/4/5 port Solenoid Valves.

7.4 Holding of pressure

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

7.5 Cannot be used as an emergency shut-off valve

This product is not designed for safety applications such as an emergency shut-off valve. If the valves are used in this type of system, other reliable safety assurance measures should be adopted.

Caution

7.6 Leakage voltage

Ensure that any leakage voltage caused by the leakage current when the switching element is OFF causes ≤2% of rated voltage across the valve.

7.7 Low temperature operation

Unless otherwise indicated in the specifications for each valve, operation is possible to -10˚C, but appropriate measures should be taken to avoid solidification or freezing of drainage and moisture, etc.

7.8 Momentary energization

If a double solenoid valve is operated with momentary energization, it should be energized for at least 0.1 second. However, depending on the secondary load conditions, it should be energized until the cylinder reaches the stroke end position, as there is a possibility of malfunction otherwise.

8 Product Disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose this product correctly, in order to reduce the impact on human health and the environment.

9 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor/importer.

SMC Corporation

URL : https:// www.smcworld.com (Global) https:// www.smc.eu (Europe)
SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan