

Solenoid Valve (with M Connector) Conforming to ISO 15407-1

Series EVS]-0],]-02 (Size 01) (Size 02)



Large capacity

	Flow rate	Cylinder size
EVS1-01 (Size: 01)	1000L/min (ANR)	ø100
EVS1-02 (Size: 02)	400L/min (ANR)	Ø80

Light weight

Size 01 (3-position): 0.26kg Size 02 (3-position): 0.18kg

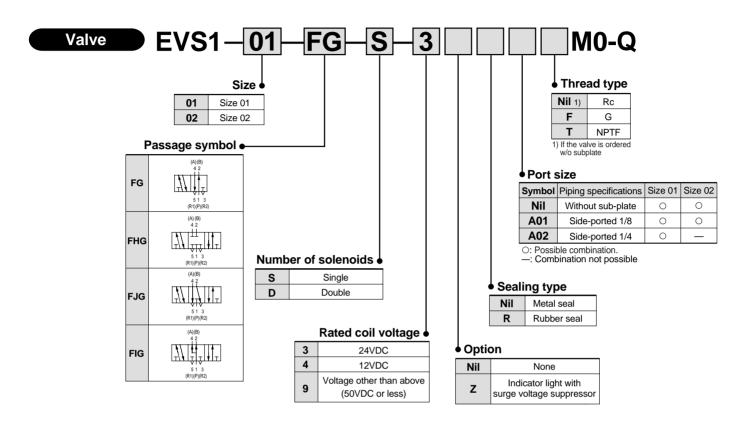
ISO 15407-1 Interface

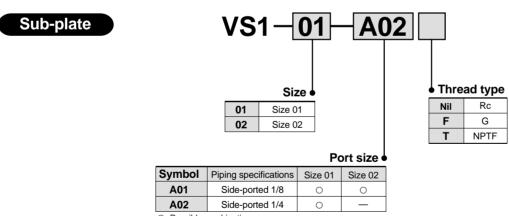
Size 01 (EVS1-01) and Size 02 (EVS1-02) Interface conforms to ISO 15407-1

Enclosure rate IP65

Dust/Splashproof type

How to Order





O: Possible combination.
—: Combination not possible

Specifications

	Piping specifications			
Model	Piping direction	Port size for 1(P), 2(B), 4(A)	Port size for 3(R2), 5(R1)	Weight (kg)
VS1-01-A01	Horizontal	1/8		0.14
VS1-01-A02	Horizoniai	1/4		
VS1-02-A01	Horizontal	1/8		0.07



Series EVS1-01

			Nominal flow rate	Response	Weight	
Valve type			1→4, 2 (P→A, B)	4, 2→5, 3 (A, B→EA, EB)	time (ms) Note 1)	(Kg) Note 2)
	Single	Metal seal	589	687	40	0,21
2-position		Rubber seal	883	982	50	0,21
2-position	Double	Metal seal	589	687	15	0,24
		Rubber seal	883	982	20	0,24
	Closed	Metal seal	589	589	60	0,26
	center	Rubber seal	785	982	80	0,26
	Exhaust	Metal seal	589	687	60	0,26
3-position	center	Rubber seal	785	1080	80	0,26
	Pressure	Metal seal	687	589	60	0,26
	center	Rubber seal	982	982	80	0,26

Note 1) Response time complies with JIS B 8375 Dynamic performance test. Note 2) Weight does not inclued sub-plate.



Series EVS1-02

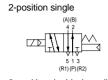
Nominal flow rate as reference (t/min) Response Weight						
			Nominal flow rate	Response	Weight	
Valve type			1→4, 2 (P→A, B)	4, 2→5, 3 (A, B→EA, EB)	time (ms) Note 1)	(Kg) Note 2)
	Single	Metal seal	294	294	20	0,14
2-position		Rubber seal	491	491	25	0,14
2-position	Double	Metal seal	294	294	13	0,16
		Rubber seal	491	491	15	0,16
	Closed	Metal seal	294	294	36	0,18
	center	Rubber seal	491	393	40	0,18
	Exhaust	Metal seal	196	196	36	0,18
3-position	center	Rubber seal	491	393	40	0,18
	Pressure	Metal seal	196	196	36	0,18
	center	Rubber seal	491	393	40	0,18

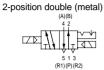
Note 1) Response time complies with JIS B 8375 Dynamic performance test. Note 2) Weight does not inclued sub-plate.

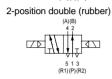


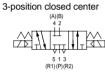
Series EVS1-01/1-02

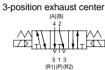
Symbol

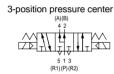












Standard Specifications

	Valve type		Metal seal	Rubber seal		
	Fluid		Air, Inert gas			
us	Maximum operating pressure		1.0MPa			
specifications	NAC-2	Single	0.1MPa	0.15MPa		
ica	Minimum operating pressure	Double	0.1MPa	0.1MPa		
eĊ.	operating process	3-position	0.15MPa	0.2MPa		
	Ambient and fluid temperature		-10° to 60°C Note 1)	-5° to 60°C Note 1)		
Valve	Lubrication		Not required (non-lube type)			
۸a	Manual override Impact resistance/Vibration resistance Enclosure		Push type (tool required)			
			150, 30m/s ² Note 2)			
			IP65 (Dust/Splashproof type)			
ns	Rated coil voltage		12VDC, 24VDC			
들点	Allowable voltage fluctuation Type of coil insulation		±10% of rated voltage			
Electric specifications			Equivalent to class B			
₽ E	Power consumption	24VDC	1W DC	(42mA)		
sb	(Current)			1W DC (83mA)		

Note 1) Use dry air to prevent condensation at low temperatures.

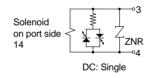
Note 2) **Impact resistance:**No malfunction resulted during an impact test using a drop impact tester. The test was performed one time each in the axial and right angle directions of the main valve and armature for both energized and deenergized conditions.

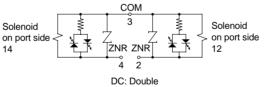
Vibration resistance: No malfunction resulted during an one-sweep test between 8.3 and 2000Hz. The test was performed in the axial and right angle directions of the main valve and armature for both energized an de-energized conditions

Specific Product Precautions

△Caution

Internal Wiring Specifications





M8 Connector: Wiring specifications (EVS1-02)



Pin no. 1: Not used

2: Solenoid on port side 12 (+)

3: COM (-)

4: Solenoid on port side 14 (+)

M12 Connector: Wiring specifications (EVS1-01)



Pin no. 1: Not used

2: Solenoid on port side 12 (+)

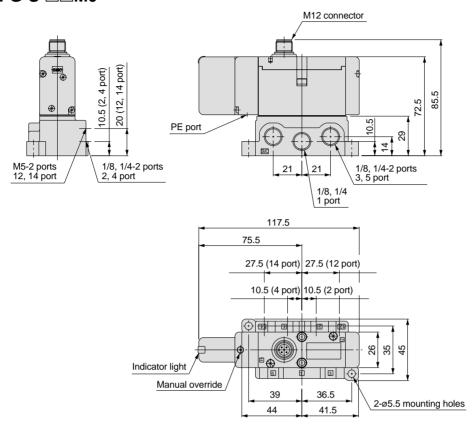
3: COM (-)

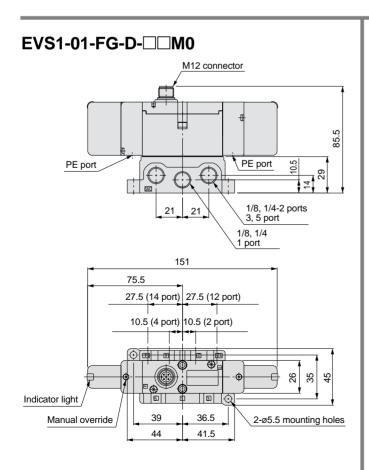
4: Solenoid on port side 14 (+)

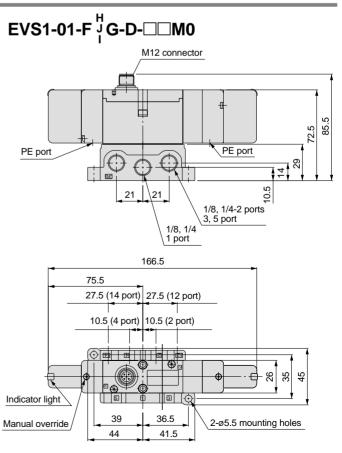
5: Ground

Dimensions

EVS1-01-FG-S-□□M0





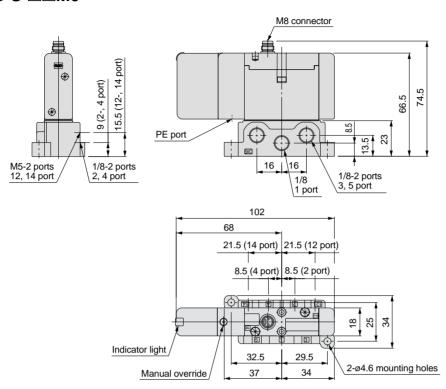


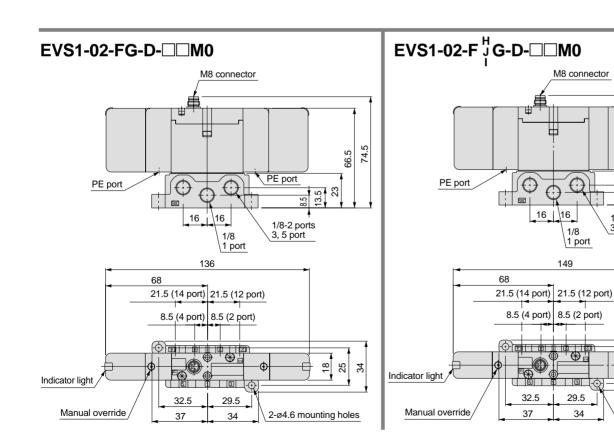


Series EVS1-01/1-02

Dimensions

EVS1-02-FG-S-□□M0





66.5

13.5

18

2-ø4.6 mounting holes

PE port

1/8-2 ports

3, 5 port



These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard by labeling "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO4414 Note 1), JIS B 8370 Note 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 possibility of serious injury or loss of life.

Note 1) ISO4414: Pneumatic fluid power - Recommendations for the application of equipment to transmission and control systems.

Note 2) JIS B 8370: Pneumatic system axiom.

▲Warning

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 with 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. Refering to the latest catalogue information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

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

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

- 3Do not service machinery/equipment or attempt to remove components until safety is confirmed.
 - 1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
 - 2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for the equipment and exhaust all residual compressed air in the system.
 - 3. Before machinery/equipment is re-started, take measures to prevent quick extensions of the cylinder piston rod etc. (Bleed air into the system gradually to create back-pressure.)
- **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 beverage, recreation equipment, emergency stop circuits, press applications, or safety equipment.
 - 3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.





Precautions for EVS1(1)

Be sure to read before handling.

Refer to main text for detailed precautions on every series.

Precautions on Design

⚠ Warning

1Operation of actuator

When an actuator, e.g. air cylinder, is to be operated using a valve, take appropriate measures to prevent potential personnel injuries caused by the actuator movement.

2Intermediate stops

In case of 3 position closed center or perfect style valve, it is difficult to make a piston stop at the required position correctly and precisely due to compressibility of air. Valves and cylinders are not guaranteed from leakage of air, so it may also make difficult to keep an intermediate stop at the same position for a long period. Contact SMC for the requirements of intermediate stops for a long periods.

3 Effect of back pressure when using a manifold

Possible malfunction due to back pressure may result when valves are used on a manifold. In case of 3 position exhaust center valve or single acting cylinder, take appropriate measures to prevent the malfunction using with Individual EXH interface assembly or individual exhaust manifold.

4 Holding pressure (including vacuum)

Since the valve may have slight internal air leakage, it may not be suitable for holding pressure (either positive or vacuum) in a tank or other vessel for an extended period of time.

5 Not suitable for use as an emergency shut-off valve

The valve represented in this catalog is not intended for use as an emergency shut-off valve. If the valve is used in this type of system, other positive shut-off components should be used in conjunction.

6 Maintenance space

Installation should ensure enough space is provided for maintenance (removal of valve, etc.)

Release of residual pressure

Install a system for releasing of residual pressure for maintenance purpose. Especially in case of 3 position closed center valve or perfect valve, ensure the release of residual pressure between valve and cylinder.

8 Using in vacuum conditions

When valve is used for switching vacuum, take measures to prevent suction of external dust or other contaminants that may lead to valve malfunction. Direct operated or external pilot operated style is recommended for this application. Contact SMC if necessary to use internal pilot operated or air operated style.

9Using double solenoid valves

When newly using double solenoid valves, the actuator may move in a unexpected direction depending on the valve switching position. Take measures to prevent the danger caused by the actuators movement.

Wentilation

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 a temperature increase caused by the heat generated by the valve.

Selection

Marning

1 Confirm specifications.

Products introduced in this catalog are designed only for use in compressed air systems (positive and vacuum pressure). Do not use with pressure or temperature beyond the specification range. Contact SMC if using any fluid other than compressed air (positive and vacuum pressure).

2Long period of continuous energization

Contact SMC if the valve is to be continuously energized for long periods.

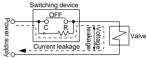
∧ Caution

1Instant energization

When a double solenoid valve is to be energized instantly, energize the valve for more than 0.1 second.

2Voltage leakage

When C-R device (Surge voltage suppressor) is used for the protection of switching device, note that voltage leakage will be increased by passing voltage leakage through C-R device.



Suppressor residual voltage leakage should be as follow:

DC coil VS7

3Drive the solenoid valve with SSR

If the minimum load amperage of the SSR is greater than the solenoid valve's load amperage, it could lead to a malfunction. Thus, pay particular attention to the catalog specifications of the elements when selecting an SSR.

4 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 1V.

5 Use in low temperature environments

Valve use is possible to temperature extremes to −10°C Take appropriate measures to avoid freezing of drainage, moisture etc.

6 Air blowing

Use external pilot operated style valves for air blowing applications. Note that the pressure drop caused bay the air blowing can have an effect on the internal pilot type valves when internal and external pilots are used on the same manifold. Furthermore, supply compressed air to the external pilot port within the pressure range prescribed in the specifications, and when using a double solenoid type for air blowing, make sure that it is always energized when air is being blown.

Mounting orientation

Rubber seal: Refer to the specifications of each series.

Metal seal: Mounting orientation of single solenoid is universal. No specific orientation for single solenoid is necessary. When installing double solenoid or 3 position style, mount the valve so that spool valve will be horizontal.





Precautions for EVS1(2)

Be sure to read before handling.

Refer to main text for detailed precautions on every series.

Installation

⚠ Warning

Olf air leakage increases or equipment is not properly operating, stop using the valve.

Check mounting conditions when air and power supplies are connected. Initial function and leakage tests should be performed after installation.

Install only after reading and understanding the safety instructions. Keep the catalog on life so that it can be referred to when necessary.

3Coating

Warnings or specifications indicated on the product should not be erased, removed, or covered up. If paint is applied to resin parts, it may have an adverse effect due to the paint solvent.

Piping

⚠ Caution

1Before piping

Make sure to clean up chips, cutting oil, dust, etc., before piping.

2Seal tape

When installing piping or fitting into a port, ensure that sealant material does not enter the port inside. When using seal tape, leave 1.5 to 2 threads exposed on the end of pipe/fitting.



3Closed center and Perfect styles

In case of closed center or perfect styles, check the piping to prevent the air leakage on the piping between valve and cylinder.

4 Tightening torque

When installing fittings, etc., follow the procedures below. 1) M3, M5

1 When using SMC fitting, etc.

After tightening by hand, give it additional 1/4 (M3), 1/6 (M5) turn with the wrench. (1/4 turn for miniature fittings.) In case that two gaskets are equipped such as universal elbow or universal tee, give it additional 1/2 turn with the wrench.

Note) If over-tightened, threaded part may be broken or gasket deformed. If tightened insufficiently, thread part may be loosened. In either case, air leakage could occur.

2 Follow the indication when using fittings other than SMC.

2) Rc(PT)

When installing fitting, etc., follow the given torque levels below.

Tightening torque

Thread	Appropriate tightening torque Nm
Rc(PT)1/8	7 to 9
Rc(PT)1/4	12 to 14
Rc(PT)3/8	22 to 24
Rc(PT)1/2	28 to 30
Rc(PT)3/4	28 to 30
Rc(PT)1	36 to 38
Rc(PT)1 1/4	40 to 42
Rc(PT)1 1/2	48 to 50
Rc(PT)2	48 to 50

6Piping to product

When piping products, refer to operation manual to avoid any mistakes.

Wiring

Polarity

When DC power is connected to a solenoid valve equipped with light and/or surge voltage suppressor, check for polarity indications.

For polarity indications:

No diode to protect polarity:

If polarity connection is wrong, the diode in the valve or switching device at control equipment or power supply may be damaged. With diode to protect polarity:

If polarity connection is wrong, the valve does not switch.

2 Applied voltage

When electricity is applied to the solenoid valve, be careful to apply the power voltage. Improper voltage may cause malfunction or coil damage.

3 Connection

Make sure no improper connection has been made after wiring.

Lubrication

①Lubrication

[Rubber seal]

- ① The valves except those listed below have been lubricated for life at manufacturer, and does not require lubrication in service.
- ② If a lubricant is used in the system, use turbine oil Class 1(no additive), ISO VG32. Once lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away.

[Metal seal]

- The valve has been lubricated for life at manufacture, and does not require lubrication in service.
- ② If a lubricant is used in the system, use turbine oil Class 1(no additive), ISO VG32.





Precautions for EVS1(3)

Be sure to read before handling.

Refer to main text for detailed precautions on every series.

Air Supply Source

⚠ Warning

1Use clean air.

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

Install an air filter.

Install an air filter up stream to the valve. Filtration degree should be $5\mu\text{m}$ or less.

2 Install an air dryer, after cooler, water separator, etc.

Air that includes excessive condensate may cause malfunction of valve and other pneumatic equipment. To prevent this, install an air dryer, after cooler, water separator etc.

If excessive carbon powder is seen, install a mist separator on the upstream side of the valve.

Refer to SMC's "Best Pneumatics Vol.4" catalog for further details on 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.
- 2Products with IP65 enclosures (based on IEC529) are protected against dust and water, however, these products cannot be based in the water..
- 3Products with enclosure conforming to IP65 rating will satisfy the specifications only if they are installed correctly. Therefore, be sure to read the instructions for respective products.
- 4 Do not use in an explosive atmosphere.
- **5**Do not use in a place subject to heavy vibrations and/or shocks. Check the specifications for each series.
- **6**The valve should not be exposed to prolonged sunlight. Use a protective cover.
- Remove emissive heat.
- **3**If using in atmosphere where there is possible contact with water drop-lets, oil, weld spatter, etc., take suitable preventative measures.
- **9**When the solenoid valve is mounted in a control panel or its energized for a long time, make sure ambient temperature is within the valve specification range.

Maintenance

Marning

Maintenance procedures are shown in the operation manual.

If maintenance is not properly done, it may cause malfunction and damage of machine or equipment.

Machine maintenance and supply/exhaust of compressed air

When machine is to be serviced, first check for removal of workpieces and run-away of equipment, etc. Then, cut the supply pressure and power, and exhaust compressed air in the system through residual pressure release mechanism.

In case of 3 position closed center or perfect styles, exhaust the residual pressure between valve and cylinder.

When the machine is to be restarted, check first that actuators are in their proper start up positions.

3 Low frequency operation

Valves should be switched at least once every 30 days to avoid malfunctions.

(Pay attention to the supply air.)

4 Manual override

Note: When manual override is engaged, connected equipment starts to operate.

⚠ Caution

①Drain

Remove condensate from air filter regularly.

2 Lubrication

Once lubricant for rubber seal type valve is introduced, continue to lubricate and use 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.









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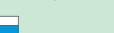
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