



# Installation and Maintenance Manual

## Solenoid valve (with M connector), Conforming to ISO15407-1, Series EVS1



Read this manual before using this product

- The information within this document is to be used by pneumatically trained personnel only.
- For future reference, please keep manual in a safe place.
- This manual should be read in conjunction with the current catalogue.

### 1 SAFETY RECOMMENDATION

#### 1.1 General recommendation

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO4414 (Note1), JIS B 8370 (Note2) and other safety practices.

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

**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.

- 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 for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.
  - Only 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.
  - Do not service machinery/equipment or attempt to remove components until safety is confirmed.**
    - Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
    - When equipment is to be removed, confirm the safety process as mentioned above. Switch off air and electrical supplies and exhaust all residual compressed air in the system.
    - Before machinery/equipment is re-started, ensure all safety measures to prevent sudden movement of cylinders etc. (Bleed air into the system gradually to create backpressure, i.e. incorporate a soft-start valve).
  - Contact SMC if the product is to be used in any of the following conditions:**
    - Conditions and environments beyond the given specifications, or if product is used outdoors.
    - Installations 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.
    - An application, which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

- CAUTION:**
- Ensure that the air supply system is filtered to 5 micron.

#### 1.2 Conformity to standard

This product is certified to and complies with the following standards:

EMC Directive 89/336/EEC EN61000-6-2, EN55011

### 2 INTENDED CONDITIONS OF USE

#### 2.1 Specifications

Valve specification	Valve Configuration	Metal seal	Rubber seal	
	Fluid	Air/Inert gas		
	Max. operating pressure	1.0MPa		
	Minimum operating pressure	Single	0.1MPa	0.15MPa
		Double	0.1MPa	
	3-position	0.15MPa	0.2MPa	
Ambient and fluid temperature	-10° to 60°C (Note 1)	-5° to 60°C (Note 1)		
Lubrication	Not required (non-lube type)			
Manual override	Push type (tool required)			
Impact resistance/Vibration resistance	150, 30 m/s <sup>2</sup> (Note 2)			
Enclosure	IP65 (Dust/Splash proof type)			
Electrical specification	Rated coil voltage	12VDC, 24VDC		
	Allowable voltage fluctuation	±10% of rated voltage		
	Coil insulation type	Equivalent to class B type		
	Power consumption (Current)	24VDC	1W DC (42mA)	
		12VDC	1W DC (83mA)	

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

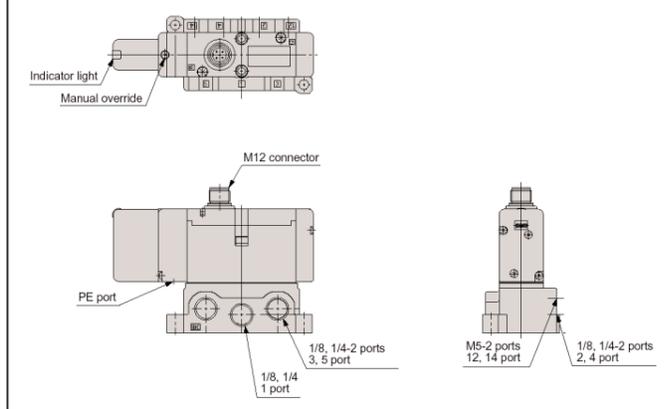
(Note 2) **Impact resistance:** No malfunction resulted from the impact test using a drop impact tester. The test was performed one time each in the axial and right angle directions of the main valve and armature, for both energized and de-energized states.

**Vibration resistance:** No malfunction occurred in a one-sweep test between 8.3 and 2000Hz. Test was performed in the axial and right angle directions of the main valve and armature for both energized and de-energized states.

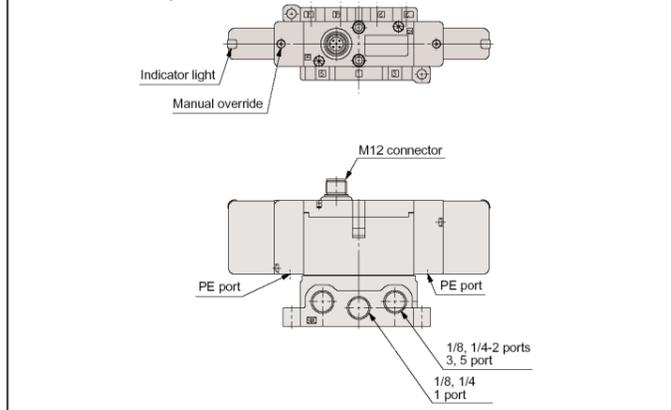
#### 2.2 Piping

##### EVS1-01-FG-S-##M0

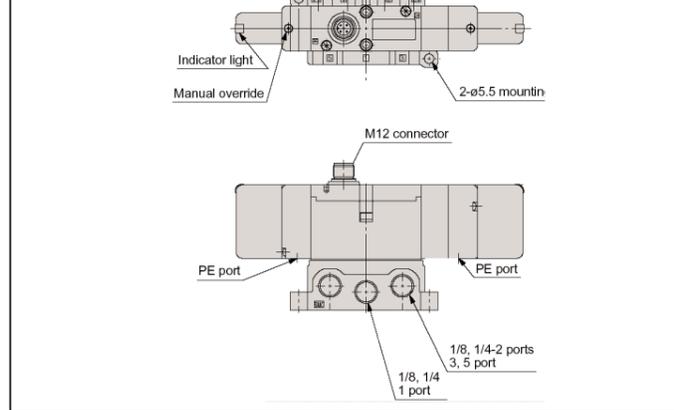
###### Single solenoid 5/2



###### Double solenoid 5/2

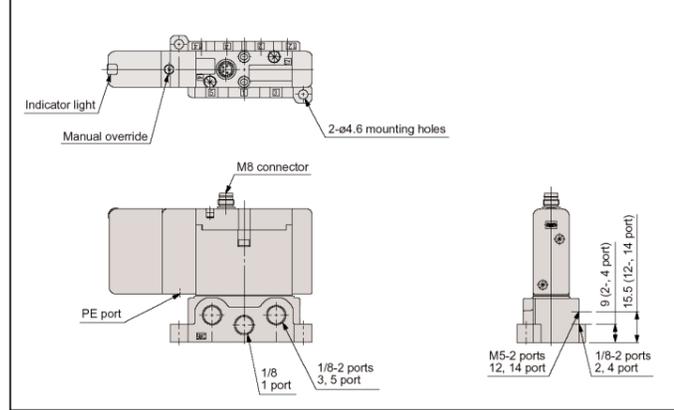


##### Double solenoid 5/3

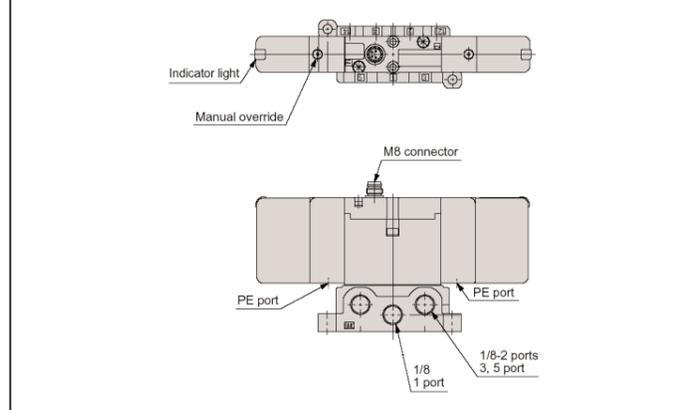


##### EVS1-02-FG-S-##M0

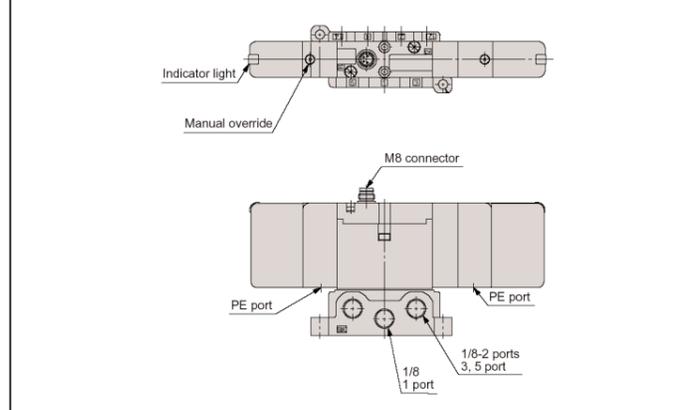
###### Single solenoid 5/2



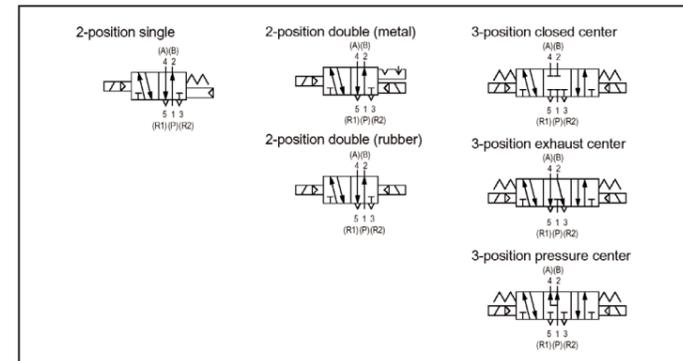
###### Double solenoid 5/2



###### Double solenoid 5/3



### 2.3 Circuit Symbols



### 3 INSTALLATION

- WARNING:**
- Do not install unless the safety instructions have been read and understood.

#### 3.1 Environment

- WARNING:**
- Do not use in an environment where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.
  - Do not use in an explosive atmosphere.
  - The product should not be exposed to prolonged sunlight. Use a protective cover.
  - Do not mount the product in a location where it is subject to strong vibrations and/or shock. Check the product specifications for above ratings.
  - Do not mount the product in a location where it is exposed to radiant heat.

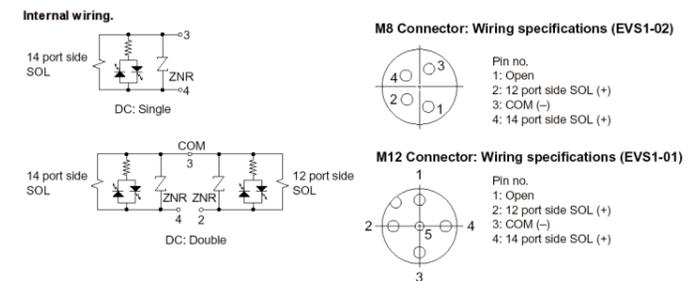
#### 3.2 Piping

- CAUTION:**
- Before piping make sure to clean up chips, cutting oil, dust etc.
  - 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.

Thread	Appropriate tightening torque (Nm)
Rc 1/8	7 to 9
Rc 1/4	12 to 14

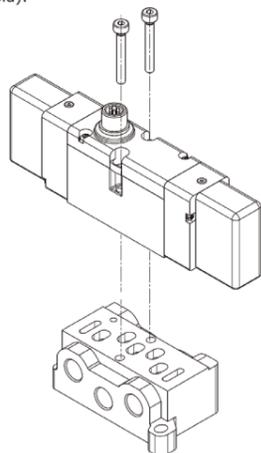
#### 3.3 Electrical connection

- CAUTION:**
- 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.



### 3.4 Mounting

EVS1-02 (Double solenoid).



Valve model	Screw size	Tightening torque (Nm)
EVS1-02	M3	0.9±0.1
EVS1-01	M4	3.0 ±0.7

### 3.5 Lubrication

#### ⚠ CAUTION:

- SMC products have been lubricated for life at manufacturer, and do not require lubrication in service.
- 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.

## 4 MAINTENANCE

#### ⚠ WARNING:

- Not following proper procedures could cause the product to malfunction and could lead to damage to the equipment or machine.
- If handled improperly, compressed air can be dangerous. Assembly, handling and repair of pneumatic system should be performed by qualified personnel only.
- Drain: remove condensate from the filter bowl on a regular basis.
- Shut-down before maintenance: before attempting any kind of maintenance make sure the supply pressure is shut off and all residual air pressure is released from the system to be worked on.
- Start-up after maintenance: apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, please verify product set-up parameters.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

## 5 LIMITATIONS OF USE

#### ⚠ WARNING:

- Do not exceed any of the specifications laid out in section 2 of this document or the specific product catalogue.

## 6 EUROPEAN CONTACT LIST

### 6.1 SMC Corporation

Country	Telephone	Country	Telephone
Austria	(43) 2262-62 280	Italy	(39) 02-92711
Belgium	(32) 3-355 1464	Netherlands	(31) 20-531 8888
Czech Republic	(420) 5-414 24611	Norway	(47) 67 12 90 20
Denmark	(45) 70 25 29 00	Poland	(48) 22-548 50 85
Finland	(358) 9-859 580	Portugal	(351) 22 610 89 22
France	(33) 1-64 76 1000	Spain	(34) 945-18 4100
Germany	(49) 6103 4020	Sweden	(46) 8 603 12 00
Greece	(30) 1- 342 6076	Switzerland	(41) 52-396 3131
Hungary	(36) 23 511 390	Turkey	(90) 212 221 1512
Ireland	(353) 1-403 9000	United Kingdom	(44) 1908-56 3888

### 6.2 Websites

SMC Corporation	<a href="http://www.smcworld.com">www.smcworld.com</a>
SMC Europe	<a href="http://www.smceu.com">www.smceu.com</a>