SMC

# Installation and Maintenance Manual

## *Series 50-VFE/VPE-X60 5/3 Port Solenoid Valve and*

## *50-VFE3#90-X60 NAMUR Solenoid Valve*

**CE 0344 Ex II 2G Ex d IIC T5 Gb**
**II 2D Ex tb IIIC T100°C Db IP66**

**Marking description**
II 2G Ex d IIC T5 Gb Ta –10°C to +50°C
II 2D Ex tb IIIC T100°C Db IP66

Group II
Category 2
Gas group IIC
Dust Group IIIC
Suitable for Gas and Dust environment
Type of Protection d "flameproof"
'X' Flameproof joint geometry, see certificate
**KEMA 09ATEX0024X**

## 1 Safety Instructions

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger", followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

| | |
|---|---|
| ⚠ **Caution** | Indicates a hazard with a low level of risk, which if not avoided, could result in minor or moderate injury. |
| ⚠ **Warning** | Indicates a hazard with a medium level of risk, which if not avoided, could result in death or serious injury. |
| ⚠ **Danger** | Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious injury. |

**⚠ 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 can be 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 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 personnel.
- **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 after confirmation of safe locked-out control positions.
  2) 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.
  3) Before machinery/equipment is re-started, ensure all safety measures to prevent sudden movement of cylinders etc. (Supply air into the system gradually to create back pressure, i.e. incorporate a soft-start valve).

## 1 Safety Instructions (continued)

- **Do not use this product outside of the specifications. Contact SMC if it is to be used in any of the following conditions:**
  1) Conditions and environments beyond the given specifications, or if the product is to be used outdoors.
  2) Installations 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.

- **Specific recommendations:**

**⚠ Warning**

- Not suitable for Zones 0/20. Only suitable for Zones 1/21 and 2/22.
- Do not open when energised.
- Do not energise both solenoids at the same time, as this can cause higher surface temperatures than under normal operating conditions.
- Do not refurbish flameproof joints.
- For information about the flameproof joints, contact SMC.

**⚠ Caution**

- This product has components made of aluminium alloy. When mounting this product, it must be installed such that, even in the event of rare incidents, ignition sources due to impact and friction sparks are excluded.

**⚠ Caution**

- Ensure that the air supply system is filtered to 5 microns.

- **Specific recommendations for Series 50-VFE3000/5000-X60 5 port valve used as a 3 port valve**
  1. Series 50-VFE3000/5000-X60 valves can be used as normally closed (N.C.) or normally open (N.O.) 3 port valves by closing one of the cylinder ports (A or B) with a plug (see Table 1).
  2. However they should be used with the exhaust ports kept open.
  3. These are convenient at times when a 3 port valve is required on a manifold.

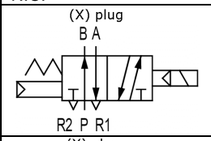
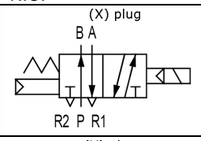
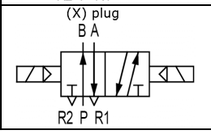
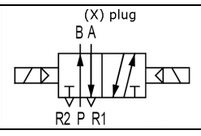
| Plug position | | B port (CYL.1 port) | A port (CYL.2 port) |
|---|---|---|---|
| Switching type | | N.C. | N.O. |
| Solenoid | Single |  |  |
| | Double |  |  |

Table 1

- **Conformity to standards:**

This product conforms to the following ATEX standards

| | |
|---|---|
| Electrical Apparatus for Explosive Gas Atmospheres | EN 60079-0 : 2009, EN 60079-1 : 2007 |
| Electrical Apparatus for use in the presence of Combustible Dust | EN 60079-31 : 2009 |

## 2 Specifications

### 2.1 General Specifications

**SERIES 50-VFE3000/5000-X60 SOLENOID VALVE**

| Series | | | 50-VFE3000-X60 | | 50-VFE5000-X60 | |
|---|---|---|---|---|---|---|
| Fluid | | | Air/Inert gas | | | |
| Operating pressure range | 2 position single/ 3 position | | 0.15 to 0.9 MPa | | | |
| | 2 position double | | 0.1 to 0.9 MPa | | | |
| Ambient and fluid temperature | | | -10°C to 50°C | | | |
| Response time | 2 position single/ 2 position double | | 45ms or less (1) | | 45ms or less (1) | |
| | 3 position | | 60ms or less (1) | | 70ms or less (1) | |
| Max. operating frequency | 2 position single/ 2 position double | | 5 Hz | | 5 Hz | |
| | 3 position | | 2 Hz | | 2 Hz | |
| Minimum operating frequency | | | Once in 30 days | | | |
| Lubrication (2) | | | Not necessary | | | |
| Effective Area mm² (Cv)(3) | 2 position single | | 1/8" | 14.4(0.8) | 1/4" | 34.2(1.9) |
| | 2 position double | | 1/4" | 18.0(1.0) | 3/8" | 45.0(2.5) |
| | 3 position | Closed centre | 1/8" | 11.7(0.65) | 1/4" | 30.6(1.7) |
| | | | 1/4" | 14.4(0.8) | 3/8" | 36.0(2.0) |
| | | Exhaust centre | 1/8" | 14.4(0.8) | 1/4" | 32.4(1.8) |
| | | | 1/4" | 18.0(1.0) | 3/8" | 41.4(2.3) |
| | | Pressure centre | 1/8" | 14.4(0.8) | 1/4" | 36.0(2.0) |
| | | | | 9.9(0.53) (4) | | 14.8(0.8) (4) |
| | | | 1/4" | 16.2(0.9) | 3/8" | 36.0(2.0) |
| | | | | 10.8(0.6) (4) | | 15.3(0.85) (4) |
| Mounting position | | | Unrestricted | | | |
| Pilot valve exhaust | | | Individual exhaust type Main/pilot valve common exhaust | | Individual exhaust type Pilot exhaust common exhaust | |

Note (1) Based on dynamic performance test JIS B8375-1981 (at 0.5MPa at rated voltage, without surge voltage suppressor).
Note (2) Use Turbine oil Class 1 ISO VG32 when lubricating.
Note (3) Effective area per one valve.
Note (4) Figure of P port, A, B port in normal position.

**SERIES 50-VPE500/700-X60 SOLENOID VALVE**

| Fluid | Air/Inert gas | | |
|---|---|---|---|
| Type of actuation | N.C or N.O. (convertible) | | |
| Pilot style | Internal pilot | External pilot | |
| Operating pressure range | 0.2 to 0.8 MPa | Supply pressure | -101.2 kPa to 0.8 MPa |
| | | External pilot pressure | 0.2 to 0.8 MPa |
| Ambient and fluid temperature | -10°C to 50°C | | |
| Response time | 45ms or less (at 0.5 MPa) (1) | | |
| Max. operating frequency | 5 Hz | | |
| Lubrication (2) | Not necessary | | |
| Manual override | Non locking push type | | |
| | Push and turn locking type D | | |
| Mounting position | Unrestricted | | |
| Effective Area mm² (Cv) | 50-VPE500-X60 | 1/4" | 36.0(2.0) |
| | | 3/8" | 41.4(2.3) |
| | 50-VPE700-X60 | 3/8" | 62.0(3.4) |
| | | 1/2" | 72.0(4.0) |

Note (1) Based on dynamic performance test JIS B8375-1981 (at 0.5MPa at rated voltage, without surge voltage suppressor).
Note (2) Use Turbine oil Class 1 ISO VG32 when lubricating.

## 2 Specifications (continued)

**SERIES 50-VFE3#90-X60 NAMUR SOLENOID VALVE**

| Fluid | Air/Inert gas |
|---|---|
| Type of actuation | N.C or N.O. (convertible) |
| Operating pressure range | 0.15 to 0.9 MPa |
| Ambient and fluid temperature | -10°C to 50°C |
| Response time | 45ms or less (at 0.5 MPa) (1) |
| Max. operating frequency | 5 Hz |
| Lubrication (2) | Not necessary |
| Manual override | Non locking push type |
| | Push and turn locking type D |
| Mounting position | NAMUR Interface |

Note (1) Based on dynamic performance test JIS B8375-1981 (at 0.5MPa at rated voltage, without surge voltage suppressor).
Note (2) Use Turbine oil Class 1 ISO VG32 when lubricating.

**SERIES 50-VF3-#-X60 PILOT VALVE**

| External connection method | | | Metal conduit type/ (Cable gland type) |
|---|---|---|---|
| Coil rated voltage | AC (50/60 Hz) | | 100, 200, *12, *24, *48, *110, *120, *220, *240V |
| | DC | | 24, *6, *12, *48, *100, *110V |
| Allowable voltage fluctuation | | | -15% to +10% of rated voltage |
| Coil insulation type | | | Type B |
| Apparent power | AC | Inrush | 9.1VA (50Hz) 7.8VA (60Hz) |
| | | Holding | 6.2VA (50Hz) 4.6VA (60Hz) |
| Power consumption | DC | | 3.5W (at coil rated voltage 6, 12, 24V) (1) |

Note (1)3.8W (48,100V), 3.9W (110V)

**Batch codes and Construction month**

| Year | | 2011 | 2012 | 2013 | ..... | 2021 | 2022 | 2023 | ..... |
|---|---|---|---|---|---|---|---|---|---|
| Month | | P | Q | R | ..... | Z | A | B | ..... |
| Jan | o | Po | Qo | Ro | ..... | Zo | Ao | Bo | ..... |
| Feb | P | PP | QP | RP | ..... | ZP | AP | BP | ..... |
| Mar | Q | PQ | QQ | RQ | ..... | ZQ | AQ | BQ | ..... |
| Apr | R | PR | QR | RR | ..... | ZR | AR | BR | ..... |
| May | S | PS | QS | RS | ..... | ZS | AS | BS | ..... |
| Jun | T | PT | QT | RT | ..... | ZT | AT | BT | ..... |
| Jul | U | PU | QU | RU | ..... | ZU | AU | BU | ..... |
| Aug | V | PV | QV | RV | ..... | ZV | AV | BV | ..... |
| Sep | W | PW | QW | RW | ..... | ZW | AW | BW | ..... |
| Oct | X | PX | QX | RX | ..... | ZX | AX | BX | ..... |
| Nov | y | Py | Qy | Ry | ..... | Zy | Ay | By | ..... |
| Dec | Z | PZ | QZ | RZ | ..... | ZZ | AZ | BZ | ..... |

## 2 Specifications (continued)

### 2.2 Piping

**50-VFE3000-X60**
**Single solenoid**

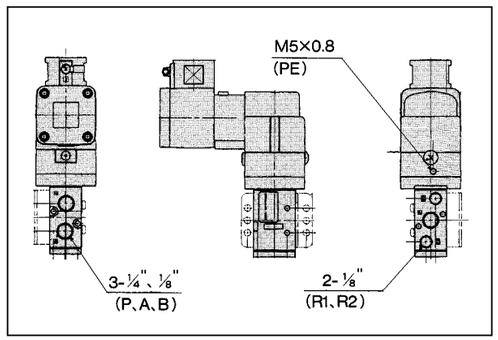



Figure 1

**50-VFE3000-X60**
**Double solenoid**

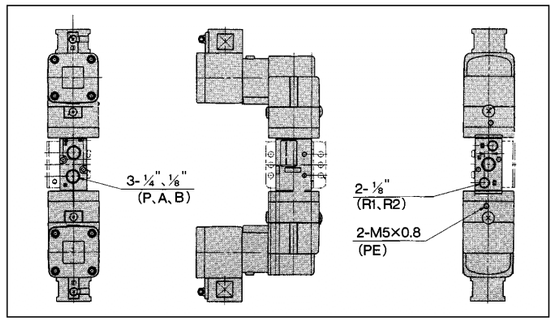



Figure 2

**50-VFE5000-X60**
**Single solenoid**

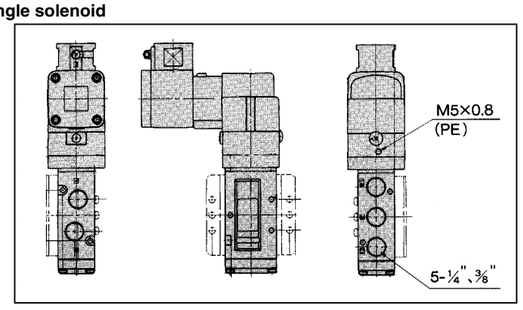



Figure 3

## 2 Specifications (continued)

**50-VFE5000-X60**
**Double solenoid**

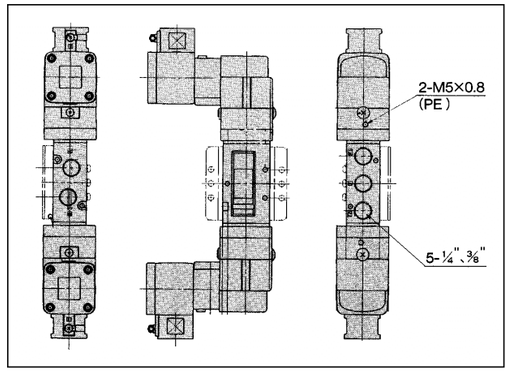



Figure 4

**50-VPE500-X60**
**Single solenoid**

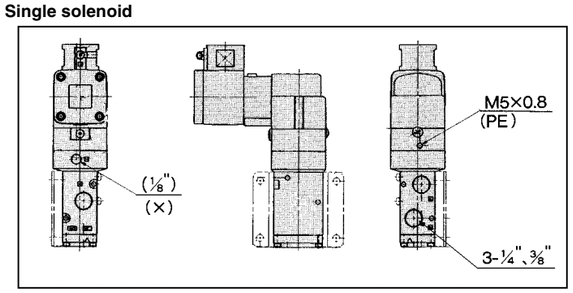



Figure 5

**50-VPE700-X60**
**Single solenoid**

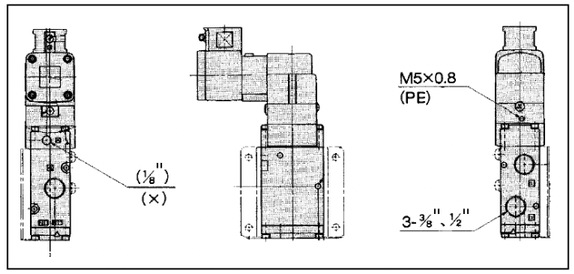



Figure 6

**50-VFE3#90-X60 NAMUR Valve**

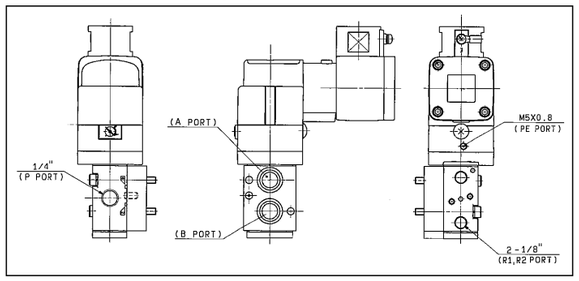



Figure 7

## 2 Specifications (continued)

| Valve Series | Threaded Fitting size | | |
|---|---|---|---|
| | 4(A), 2(B) port | 1(P), 3/5(E) port | PE Pilot EXH port |
| **50-VFE-X60** | 1/8", 1/4", 3/8" | 1/4", 3/8" | M5 |
| **50-VPE-X60** | 1/8", 1/4", 3/8", 1/2" | 1/4", 3/8", 1/2" | M5 |
| **50-VPE3#90-X60** | NAMUR interface | 1/8", 1/4" | M5 |

Table 2

**50-VFE3000-X60**
**Type 30 manifold**

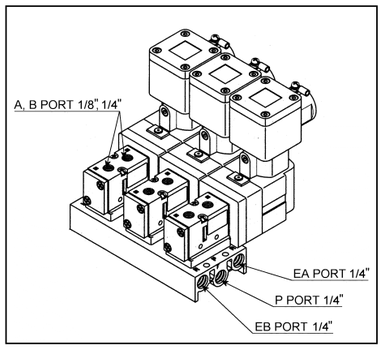



Figure 8

**50-VFE3000-X60**
**Type 40 manifold**

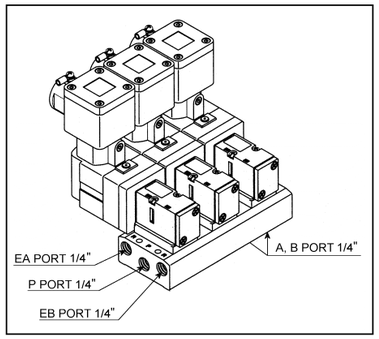



Figure 9

**50-VFE3000-X60**
**Type 50 manifold**

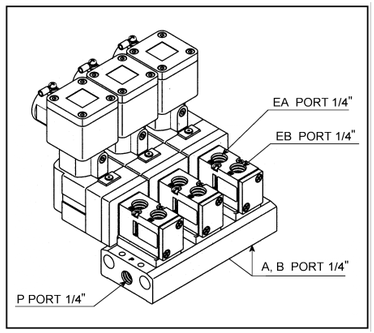



Figure 10

## 2 Specifications (continued)

**50-VFE5000-X60**
**Type 20 manifold**

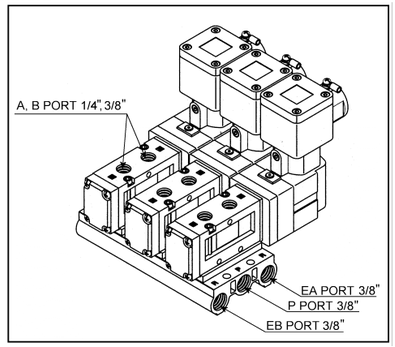



Figure 11

**50-VFE5000-X60**
**Type 21 manifold**

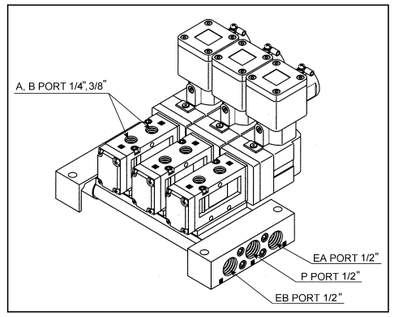



Figure 12

**50-VFE5000-X60**
**Type 40 manifold**

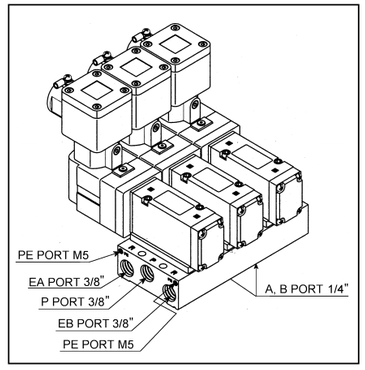



Figure 13

## 2 Specifications (continued)

| Manifold Series | Threaded Fitting size | | |
|---|---|---|---|
| | 4(A), 2(B) port | 1(P), 3/5(E) port | PE Pilot EXH port |
| 50-VFE3000-X60 | 1/8", 1/4" | 1/4" | - |
| 50-VFE5000-X60 | 1/4", 3/8" | 3/8", 1/2" | M5 |

Table 3

### 2.3 Electrical entry (see Figure 14)

The terminal box can be rotated 300° about plane 'A'.

- Loosen screw 'C' and rotate the terminal box to the desired position.
- Re-tighten screw to lock the terminal box in position.

The cover can be rotated 360° about plane 'B'.

- Undo screw 'D' and rotate the cover to the desired position – there are 4 positions – in increments of 90°.
- Re-assemble screw to lock the cover in place.

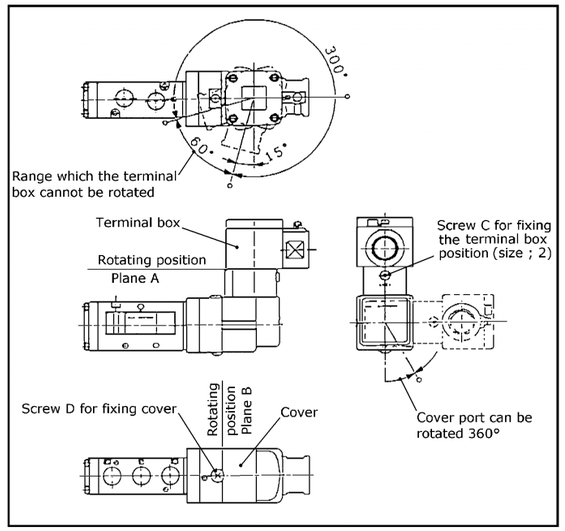



Figure 14

## 3 Installation

### 3.1 Installation

**Warning**

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

## 3 Installation (continued)

### 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, except Zones 1/21 and 2/22.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact. Check the product specifications.
- Do not mount in a location exposed to radiant heat.
- Remove emissive heat.
- Employ suitable protective measures in locations where there is contact with water droplets, oil or welding splatter, etc.
- When the solenoid valve is mounted in a control panel or is energised for a long time, make sure the ambient temperature is within the valve specification range.

### 3.3 Piping

**Warning**

- Before 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 1.5 to 2 threads exposed on the end of the pipe/fitting.
- Install piping so that it does not apply pulling, pressing, bending or other forces on the valve body.
- Tighten fittings to the specified tightening torque.

| Thread | Tightening Torque |
|---|---|
| M5 | By hand + 1/6 turn with a wrench (1/4 turn for miniature fittings) |
| Rc 1/8 | 7 to 9 |
| Rc 1/4 | 12 to 14 |
| Rc 3/8 | 22 to 24 |
| Rc 1/2 | 28 to 30 |

Table 4

### 3.4 Electrical Connection

**Caution**

- The power supply should be fitted with a switch or circuit breaker in close proximity to the equipment and within easy reach of the operator. It shall be clearly marked as the disconnecting device for the equipment.
- Avoid mis-wiring, as this can cause malfunction, damage and fire to the product.
- Use voltage that is within –15% to +10% of the rated voltage. Application of incorrect voltage may cause malfunction or damage.
- Use electrical circuits that do not generate chattering in their contacts.
- Do not bend or pull cables repeatedly.
- The power supply should be fitted with an appropriate fuse. See Table 5

| Voltage (DC) | Voltage (AC) | Appropriate fuse (Amps) |
|---|---|---|
| DC6 | AC12 | 1.5 |
| DC12 | AC24 | 1.5 |
| DC24 | AC32 | 1.5 |
| DC30 | AC48 | 1.5 |
| DC48 | AC100 | 1.5 |
| DC75 | AC110 | 1.5 |
| DC100 | AC120 | 1.5 |
| DC110 | AC200 | 1.5 |
| DC120 | AC220 | 1.5 |
| DC125 | AC240 | 1.5 |

Table 5

- When connecting C-R element parallel to switching element, leakage current flows through C-R element and the leakage voltage increases.

## 3 Installation (continued)

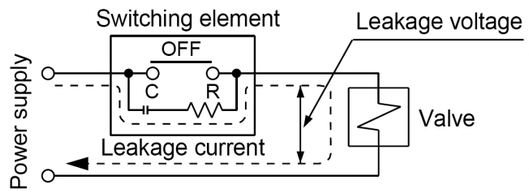



Figure 15

Ensure that the voltage leakage across the coil is as follows:
With AC coil: 15% or less of rated voltage.
With DC coil: 3% or less of rated voltage

**Danger**

- **Disconnect power supply before removing or making electrical connections.**
- **Cable entry must be made using metal conduit or cable gland, see** Figure 19**and** Figure 21**.**

**Assembly of terminals to cable**

- Use cables with insulated wires, stranded, 1.04 to 2.63 $mm^2$.
- Terminate wires using crimp terminals (JST Connectors part number V2-M4 or equivalent) to suit M4 screws.
- Use crimping tool to attach terminals (part number YNT-1614 – made by Japan Crimp Manufacturing Co. or equivalent).
- After crimping, check the crimp by slightly pulling the insulated wire.

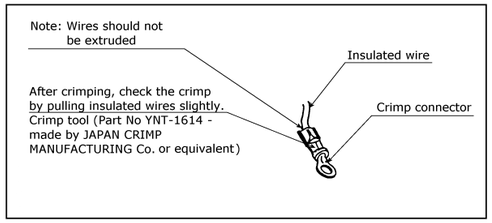



Figure 16

**Assembly of cable to valve**

- Ensure cables have correct crimp terminals to suit M4 screws.
- Ensure the terminal box is locked in position.
- Remove the four M4 x 10 screws and carefully remove terminal cover ensuring mating surfaces are not damaged.
- Feed cable through cable entry and attach wires to valve using M4 x 6 round head screws with M4 washers.
- Ensure wires are correctly connected to the corresponding terminals.
- Replace terminal cover, ensuring mating surfaces are not damaged, and torque tighten cover screws to 1.35 to 1.45 N•m.

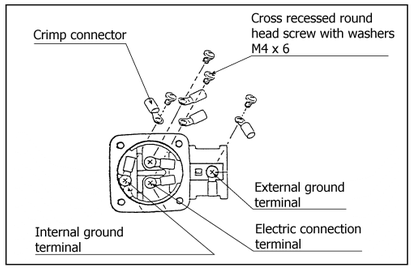



Figure 17

## 3 Installation (continued)

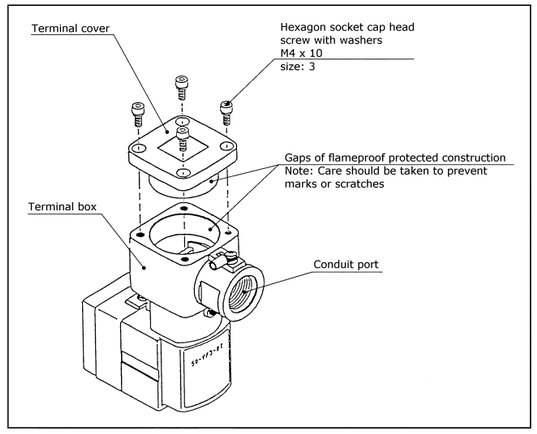



Figure 18

**Metal conduit threaded type entry**

- Metal conduit should be heavy gauge steel with parallel G1/2 thread.
- Ensure a minimum engagement of five full threads and secure with locknut.
- During assembly, prevent excessive force being applied to the solenoid valve, by using a spanner on the flats provided on the valve.
- In humid environment, coat the threads with a liquid gasket.

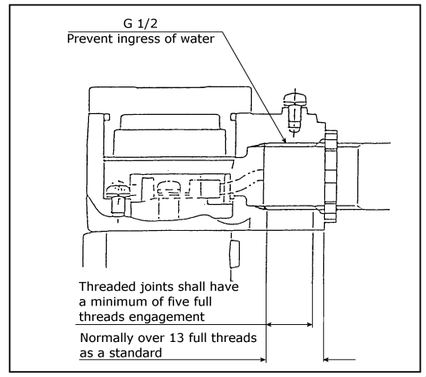



Figure 19

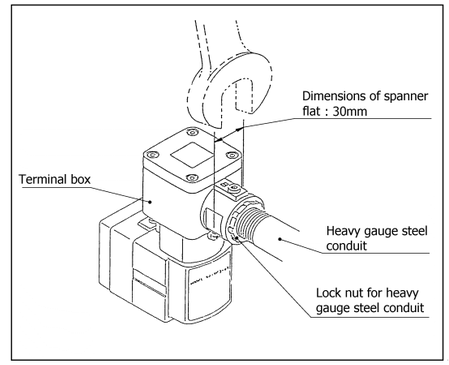



Figure 20

## 3 Installation (continued)

**Flameproof enclosure cable gland (not supplied) type entry**

- Cable gland connector should be ATEX certified to a minimum of Group II 2GD Ex d IIC.
- Select cable gland connector applicable to flexible cable O/D and with a parallel G1/2 thread.
- Follow instructions supplied with cable gland on how to assemble to cable.
- Ensure a minimum engagement of five full threads and secure with locknut.
- During assembly, prevent excessive force being applied to the solenoid valve, by using a spanner on the flats provided on the valve.
- In humid environment, coat the threads with a liquid gasket.

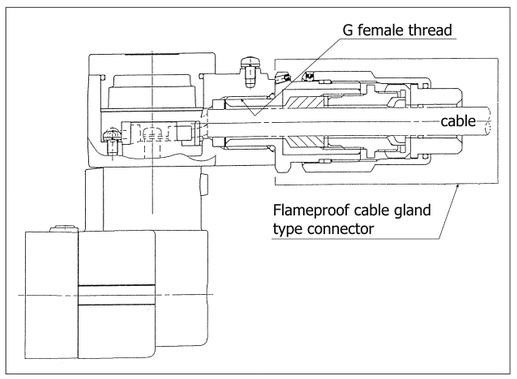



Figure 21

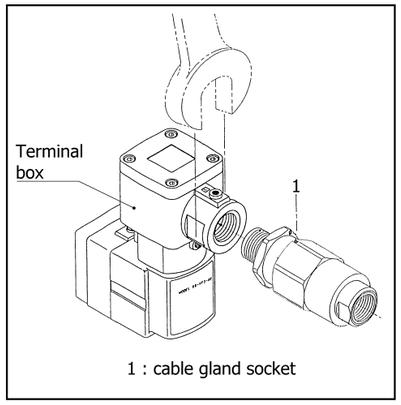



Figure 22

### 3.5 Mounting

**⚠ Danger**

- Never add or remove a valve from the manifold when energised.
- Never remove terminal box cover when power is connected to the manifold.
- Never disconnect or reconnect cables or connectors when power is connected to the valves.

**⚠ Caution**

- Be sure to cut off power and the air supply and confirm that no air is left in actuators, piping and manifolds before disassembling, as remaining air may cause an accident.
- Before assembly and installations, confirm that rubber parts such as gaskets and O rings are assembled to every block. If rubber parts are missing, air leakage may occur.

## 3 Installation (continued)

**Bracket mounting:**
**50-VPE-X60**

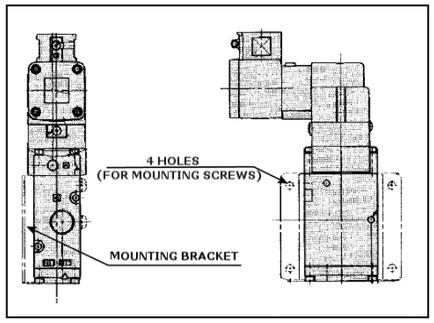



Figure 23

**50-VFE-X60**

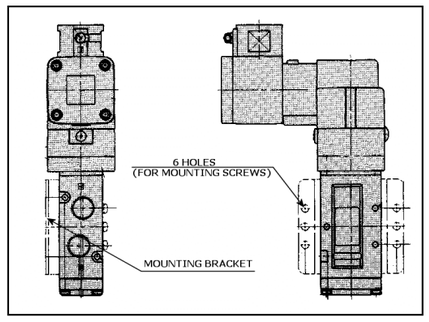



Figure 24

| Valve | Recommended Mounting screw size |
|---|---|
| 50-VPE-X60 | M5 |
| 50-VFE-X60 | M6 |

Table 6

**Manifold 50-VFE-X60:**
**Removal of valve**

- Remove screws and gently lift valve from manifold.
- Ensure gasket and spacer are not misplaced or damaged.
- Disconnect electrical connection.

**Assembly of valve**

- Reconnect the electrical connection.
- Assemble valve to the manifold in the correct orientation, ensuring spacer and all gaskets are present.
- Torque tighten screws to torque shown in Table 7

| Valve Series | Appropriate tightening torque N•m |
|---|---|
| 50-VFE3000-X60 | 1.3 to 1.5 |
| 50-VFE5000-X60 | 1.3 to 1.5 |

Table 7

## 3 Installation (continued)

**50-VFE-X60 Valve mounting:**

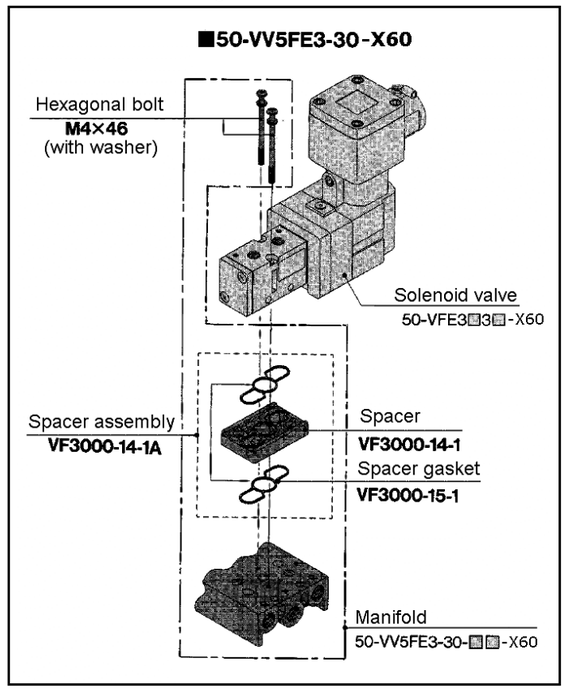



Figure 25

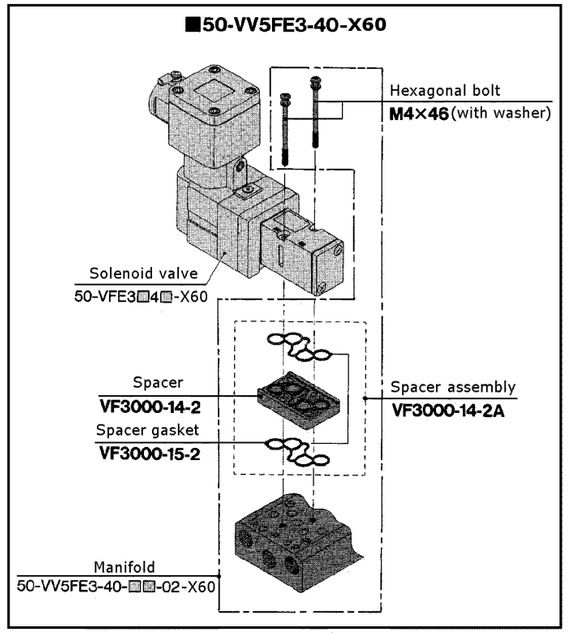



Figure 26

## 3 Installation (continued)

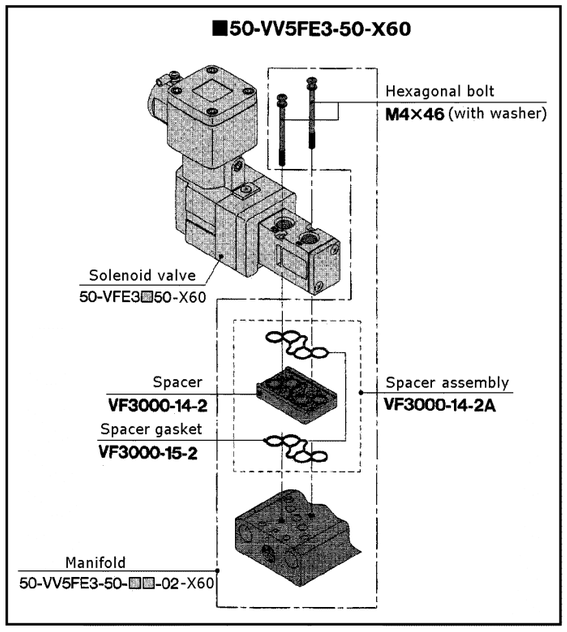



Figure 27

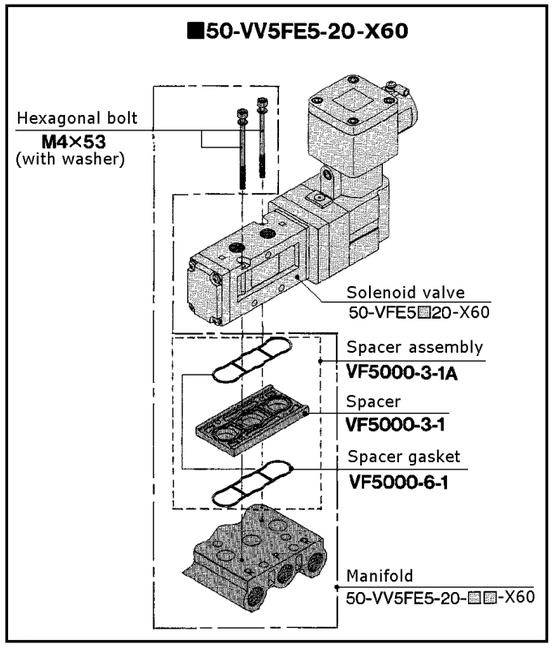



Figure 28

## 3 Installation (continued)

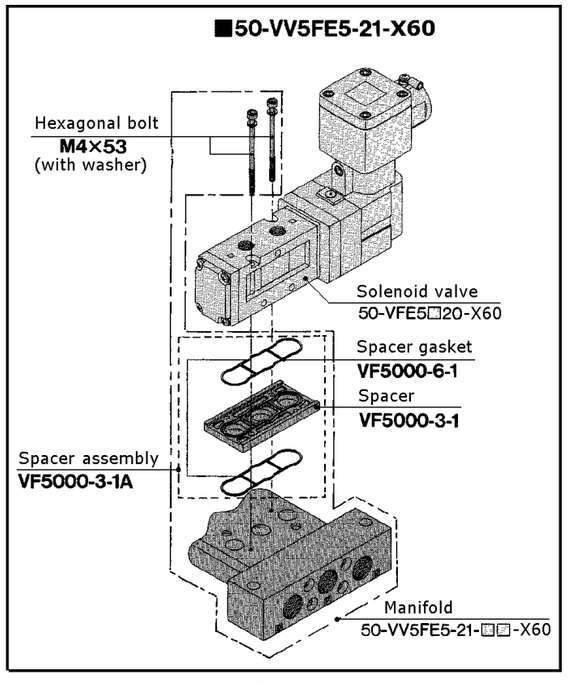



Figure 29

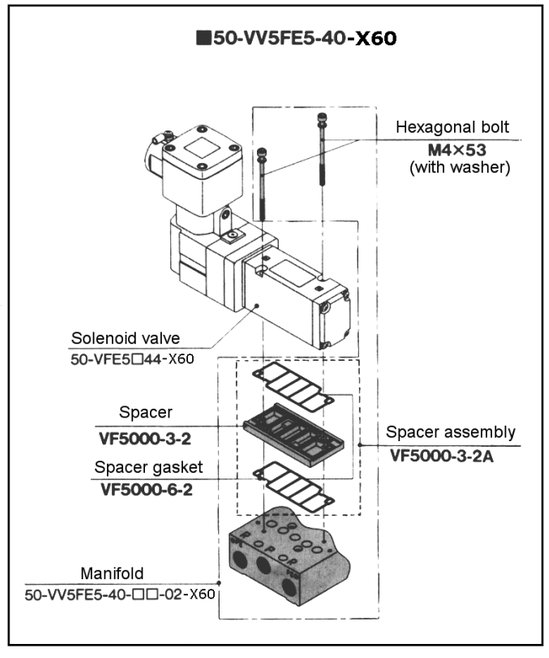



Figure 30

## 3 Installation (continued)

**50-VFE3190-X60 NAMUR Valve mounting:**

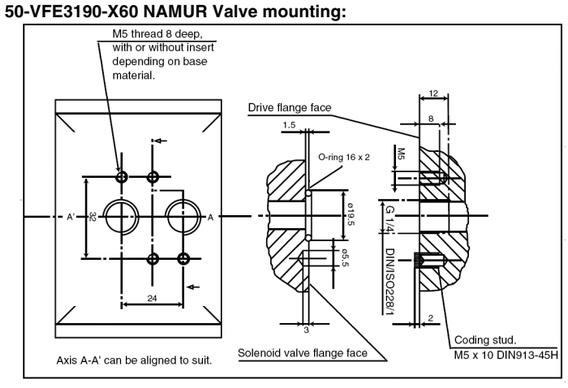



Figure 31

- The NAMUR solenoid valve can be attached with 2 mounting bolts.
- The position of the coding stud hole is up to the manufacturer and thus also determines the location of the coding stud.

**Caution**

- Ensure all gaskets are present before mounting valves.
- Do not let foreign matter stick to gaskets or sealing faces of the valve to avoid air leaks

### 3.6 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, 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 Settings

### 4.1 Manual Override

**Caution**

- Since connected equipment will operate when the manual override is activated, confirm that conditions are safe prior to activation.

**Non-locking push type (tool required)**

- Push down the manual override button with a small screwdriver, etc. until it stops ON.
- Hold this position for the duration of the check (ON position).
- The manual override will return when released to the OFF position.

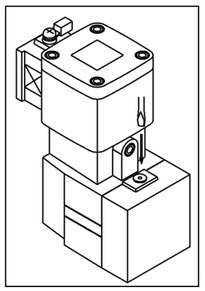


Figure 32

**Slotted locking push type (tool required)**

- Push down the manual override button with a small flat head screwdriver until it stops and turn 90° clockwise to lock (ON position).
- Turn anti-clockwise to release to the OFF position.

## 4 Settings (continued)

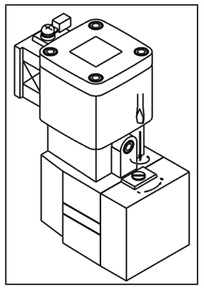


Figure 33

### 4.2 Change of Actuation – 50-VPE500-X60 and 50-VPE700-X60

**Body ported**

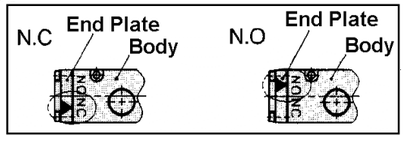



Figure 34

- When changing the actuation from normally closed to normally open type, remove the end plate from the body and reset the ▼ mark on the end plate to correspond with the 'NO' mark on the body as shown in Figure 34.
- Refer to Table 8 for piping.

| Actuation \ Port | P | A | R |
|---|---|---|---|
| N.C. | Inlet side | Outlet side | Exhaust side |
| N.O. | Exhaust side | Outlet side | Inlet side |

Table 8

## 5 Circuit symbols

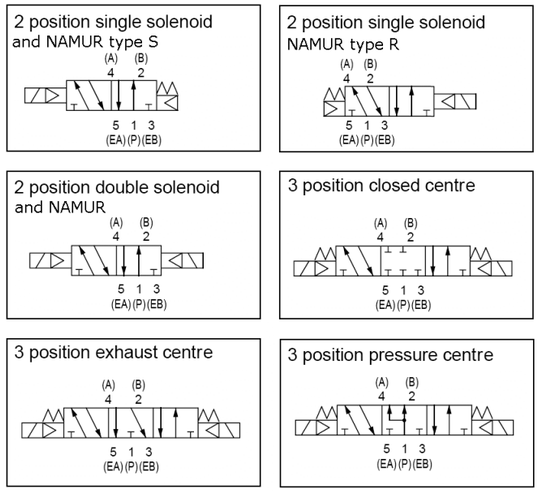



Figure 35

## 6 Internal Circuit & Wiring

**50-VF3-#-X60 Pilot Valve internal wiring**

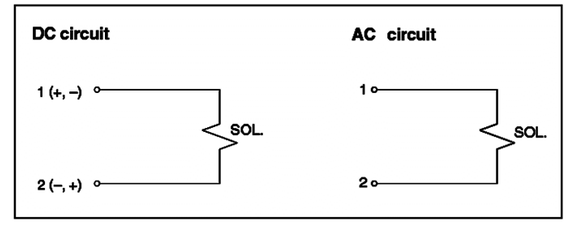



Figure 36

## 7 How to Order

Refer to the catalogue for this product.

## 8 Outline Dimensions (mm)

Refer to the catalogue for this product.

## 9 Maintenance

### 9.1 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.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Drain: remove condensate from the filter bowl on regular basis.
- Low frequency operation:
  Switch valves at least once every 30 days to prevent malfunction. Also, in order to use it under optimum state, conduct a regular inspection once every 6 months.
- Filters and strainers:
  1. Be careful regarding clogging of filters and strainers
  2. Replace filter elements after one year of use, or earlier if the pressure drop reaches 0.1 MPa.
  3. Clean strainers when the pressure drop reaches 0.1 MPa.

### 9.2 Blanking plate assembly

- For blanking off any spare stations on the manifold assembly.
- Assemble blanking plate to manifold block ensuring spacer and gaskets are present, see Figure 37 and Figure 38
- Torque tighten mounting screws to torque shown in Table 9

## 9 Maintenance (continued)

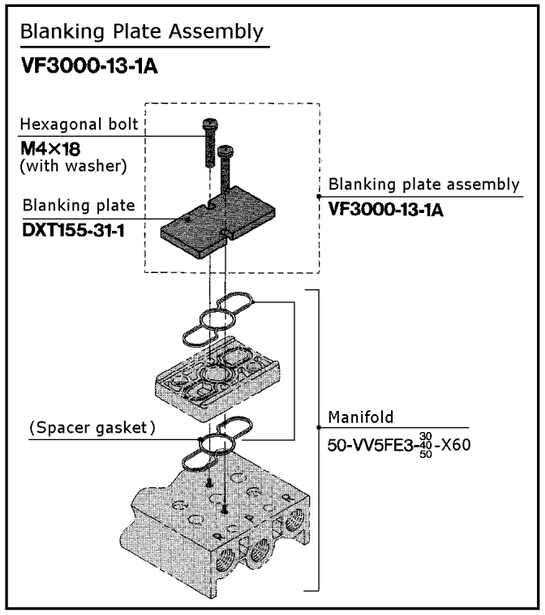



Figure 37

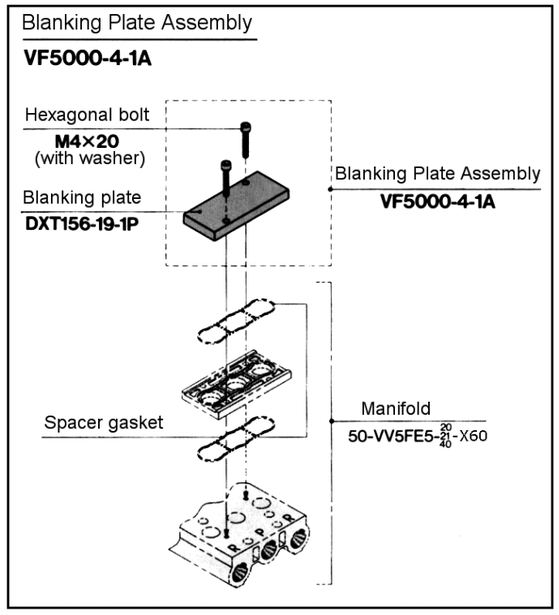



Figure 38

| Valve Series | Appropriate tightening torque N•m |
|---|---|
| 50-VFE3000-X60 | 1.3 to 1.5 |
| 50-VFE5000-X60 | 1.3 to 1.5 |

Table 9

## 9 Maintenance (continued)

**⚠ Caution**

- Before disassembly, be sure to turn off electric power and air supplies.
- Confirm that the air has been completely exhausted before performing any work.
- Take care not to get scratches or dirt etc. on the seals, as this can cause leakage

## 10 Limitations of Use

**⚠ Danger**

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

**10.1 Maintenance space**

- The installation should allow sufficient space for maintenance activities.

**10.2 Ambient environment**

- Use within the allowable ambient temperature range.
- Do not use in atmospheres where the valve is in direct contact with corrosive gases, chemicals, salt water, water or steam.

**10.3 Mounting orientation**

- The mounting orientation is unrestricted.
- Do not use in applications where vibration or impact exceed the products specification.

**10.4 Cannot be used as an emergency shut-off valve etc.**

- 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 also be adopted.

**10.5 Extended periods of continuous energisation**

- If it is intended to energise a valve for an extended period of time, please consult SMC.

**10.6 Energisation time**

- Double solenoid valves must be energised for at least 0.1 seconds to ensure correct operation.

**10.7 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.

**10.8 External pilot type (optional)**

Please use an external pilot type in the following cases;

- In a vacuum or low pressure of 0.2MPa or less.
- When P port is extremely constricted.
- When A port is exhausting to atmosphere if using to blow work pieces away, etc.

## 11 Contacts


| | | | |
|---|---|---|---|
| **AUSTRIA** | (43) 2262 62280-0 | **LATVIA** | (371) 781 77 00 |
| **BELGIUM** | (32) 3 355 1464 | **LITHUANIA** | (370) 5 264 8126 |
| **BULGARIA** | (359) 2 974 4492 | **NETHERLANDS** | (31) 20 531 8888 |
| **CZECH REP.** | (420) 541 424 611 | **NORWAY** | (47) 67 12 90 20 |
| **DENMARK** | (45) 7025 2900 | **POLAND** | (48) 22 211 9600 |
| **ESTONIA** | (372) 651 0370 | **PORTUGAL** | (351) 21 471 1880 |
| **FINLAND** | (358) 207 513513 | **ROMANIA** | (40) 21 320 5111 |
| **FRANCE** | (33) 1 6476 1000 | **SLOVAKIA** | (421) 2 444 56725 |
| **GERMANY** | (49) 6103 4020 | **SLOVENIA** | (386) 73 885 412 |
| **GREECE** | (30) 210 271 7265 | **SPAIN** | (34) 945 184 100 |
| **HUNGARY** | (36) 23 511 390 | **SWEDEN** | (46) 8 603 1200 |
| **IRELAND** | (353) 1 403 9000 | **SWITZERLAND** | (41) 52 396 3131 |
| **ITALY** | (39) 02 92711 | **UNITED KINGDOM** | (44) 1908 563888 |

# SMC Corporation

## 4-14-1 Soto-Kanda, Chiyoda-ku,

## Tokyo 101-0021, Japan

URL : http// www.smcworld.com (Global) http// www.smceu.com (Europe)


Specifications are subject to change without prior notice from the manufacturer.