



Installation and Maintenance Manual

55-VPA300/500/700 3 Port Air Operated Valve

II 2GD c T85°C (T5) -10°C ≤ Ta ≤ +50°C

Read this manual before using this product

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

| |
|-----------------------------------------------------------------------------|
| Marking description |
| II 2GD c T85°C (T5) -10°C ≤ Ta ≤ +50°C |
| Equipment Group II Category 2GD Suitable for Gas and Dust environment |

1 SAFETY

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 - Recommendations for the application of equipment to transmission and control 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 component 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 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:

- Directive94/9/EC
- EN13463-1:2001 Non-electrical equipment for potentially explosive atmospheres. Part 1. Basic method and requirements
- EN13463-5 Non-electrical equipment intended for use in potentially explosive atmospheres. Part 5. Protection by constructional safety 'c'

1.3 Specific recommendations

WARNING

- The Ex-protected valve may be operated in potentially explosive atmospheres for gas and dust zone 1, 2 and 21, 22.
- Read the specification on the product label

2 INTENDED CONDITIONS OF USE

2.1 Specifications

| | | |
|--------------------------------------------|---------------------------------------------------------------|---------------------|
| Fluid | Air | |
| Actuation style | Normally Closed or Normally Open (possible to exchange) | |
| Operating pressure range | Standard | 0.2 to 0.8 MPa |
| | Vacuum | -101.2kPa to 0.2MPa |
| Pilot pressure | Same as operating pressure (Min. 0.2MPa) | |
| Ambient and fluid temperature | -10°C to 50°C | |
| Lubrication | Not required (Use turbine oil class1 ISO VG32 if lubricating) | |
| Mounting | Free | |
| Impact/vibration resistance ⁽¹⁾ | 300/50 m/s ² | |

Note1:

- Impact resistance: There should be no malfunction of the valve after testing using a drop impact tester along the valve axis and at right angles to the valve and armature. Carry out each test with the valve energised and de-energised (Value at initial stage).
- Vibration resistance: There should be no malfunction of the valve after testing using an 8.3 to 2000Hz sweep along the valve axis and at right angles to the valve and armature. Carry out each test with the valve energised and de-energised (Value at initial stage).

Production Batch code

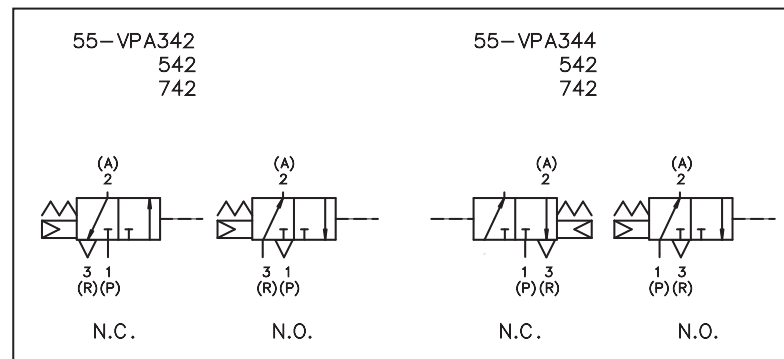
The production batch code printed on the label indicates the month and year of manufacturing as per the following table.

| Construction Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 2004 | IO | IP | IQ | IR | IS | IT | IU | IV | IW | IX | IY | IZ |
| 2005 | JO | JP | JQ | JR | JS | JT | JU | JV | JW | JX | JY | JZ |
| 2006 | KO | KP | KQ | KR | KS | KT | KU | KV | KW | KX | KY | KZ |

2.2 Piping

For port identification, see section 3.2.

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.
- 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.

Fitting Tightening Torque

| Thread | Appropriate tightening torque (Nm) |
|--------|----------------------------------------------------------------------|
| M5 | By hand + 1/6 turn with the wrench (1/4 turn for miniature fittings) |
| 1/8 | 7 to 9 |
| 1/4 | 12 to 14 |
| 3/8 | 22 to 24 |
| 1/2 | 28 to 30 |

- When using a body ported type valve, connect the piping as shown in the table below.

| Port | 1(P) | 2(A) | 3(R) |
|-----------------|--------------|------------|--------------|
| | Actuation | | |
| Normally closed | Upstream | Downstream | Exhaust side |
| Normally open | Exhaust side | Downstream | Upstream |

3.3 Electrical connection

No electrical connection

3.4 Mounting

WARNING

Impact and friction sparks on light metals can form ignition sources, therefore

- Do not use tools with corroded surfaces
- Protect this products from impact of friction form other objects.

Prevent dust penetration thought the ports into the internal of the valve. This could damage the seals and will damage the valve.

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. SETTINGS AND PROGRAMMING

For using this valve as normally open or normally closed type, see section 2.3 Circuit symbols and section 5. Maintenance, of this installation and maintenance manual

5. MAINTENANCE

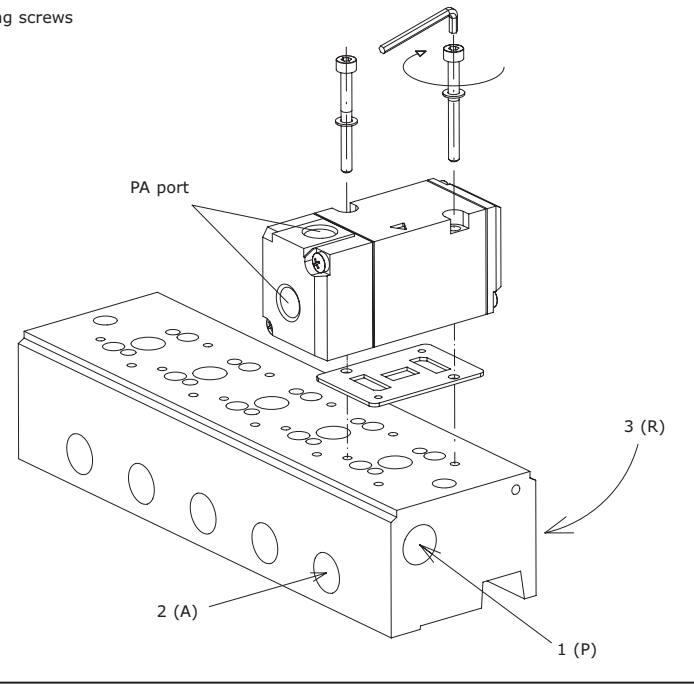
WARNING:

- 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 take the product apart unless for maintenance purposes.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Clean the product regularly to avoid dust deposits.

5.1 Replacing the valve

Tightening torque retaining screws

55-VPA300: 0.6 Nm
 55-VPA500: 1.4 Nm
 55-VPA700: 2.9 Nm



- Ensure gasket is correctly in position on the sub-base or manifold block
- Position the valve onto the manifold block or sub-base
- Re-fit and tighten the two retaining screws
- Re-connect the pilot valve fitting
- Tighten valve retaining screws

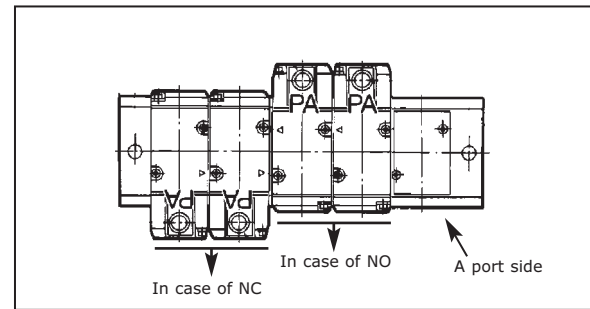
5.2 Blanking plate

- A blanking plate must be fitted on an unused manifold station
- Fitting blanking plate
- Ensure gasket is correctly fitted to manifold
- Fit blanking plate to manifold
- Fit and tighten retaining screws
- Removal is the reverse of the above
- Ensure gasket is retained

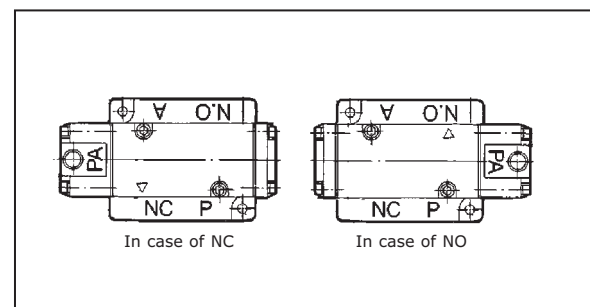
5.3 Change of Actuation

- The actuation of the valve can be switched from normally open to normally closed, by changing the mounting position of the valve on the manifold or sub-plate.

Manifold Base



Sub Base



- When changing the actuation from normally closed style to normally open style, remove the body from the sub plate and reset the "V" mark on the body corresponding to the "NO" mark on the sub plate.

6. LIMITATIONS OF USE

! WARNING:

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

7 EUROPEAN CONTACT LIST

7.1 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 0700 |
| Greece | (30) 1- 342 6076 | Switzerland | (41) 52-396 3131 |
| Hungary | (36) 1-371 1343 | Turkey | (90) 212 221 1512 |
| Ireland | (351) 1-403 9000 | United Kingdom | (44) 1908-56 3888 |

7.2 Websites

SMC Corporation www.smcworld.com
 SMC Europe www.smceu.com