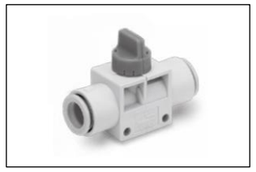
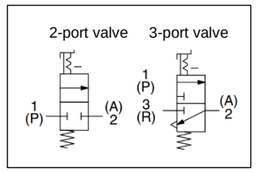
ORIGINAL INSTRUCTIONS

Instruction Manual
Finger Valve
Series VHK#A





The intended use of this product is to switch air pressure.

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 and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power — General rules and safety requirements for systems and their components
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.

⚠ **Danger**	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
⚠ **Warning**	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Caution**	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate 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. This product must not be used in residential areas.

2 Specifications

2.1 General specifications

Valve	2/3-port valves
Fluid	Air
Proof pressure [MPa]	1.5
Max. operating pressure [MPa] Note 1)	1.0
Operating vacuum pressure [kPa] Note 2)	-100
Ambient and fluid temperature [°C]	0 to 60 (no freezing)
Flow characteristics	Refer to catalogue
Impact/Vibration resistance [m/s^2] Note 3)	1000/50
Applicable tubing material Note 4)	Nylon, soft nylon, polyurethane
Accessory (option)	Bracket

Table 1.

Note 1) Please note that when the valve is used at micro pressures of 0.1 MPa or less, valve leakage may be more than the standard value (5 cm^3/min).
Note 2) Use VHK-2 (2-port valve) for vacuum applications.

2 Specifications – continued

Note 3) Impact resistance: No malfunction occurred when it was tested with an impact of 1000 m/s^2 for 11 ms in accordance with JIS C 60068-2-27(IEC 60068-2-27) in the axial direction and at right angles to the main valve and armature; in both energized and de-energised states and for 3 times or more in each condition. (Values quoted are for a new valve).
Vibration resistance: No malfunction occurred in 20 times sweep test between 10 and 150 Hz (amplitude: 0.35 mm, acceleration: 50 m/s^2) according to JIS C 60068-2-6 (IEC 600682-2-6). Tests are performed at both energized and de-energized states in the axial direction and at right angles to the main valve and armature and for 3 times in each condition. (Values quoted are for a new valve).

Note 4) Use caution about the maximum operating pressure when soft nylon or polyurethane tubing is used. (Refer to the Web Catalogue for details.)

2.2 Knob colour

2-port valves and 3-port valve can be distinguished by the colour of their knobs

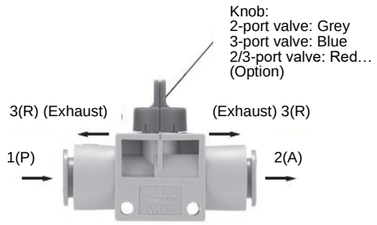


Figure 1.

2.3 OPEN/SHUT indicator

The position of the knob indicates whether the valve is open or closed. To open the valve, turn the knob anticlockwise.

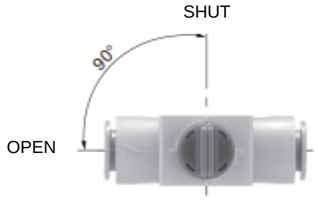


Figure 2.

2.4 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.
- Do not use in high humidity environment where condensation can occur.

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.

3 Installation – continued

- To screw in the fitting, first hand-tighten; then, use a tool to rotate it 2 to 3 turns.

3.3.1 One-touch fittings

⚠ Caution

3.3.1.1 Tube attachment and detachment

Refer to the Specific Precautions in the catalogue.

3.3.1.2 Precautions on other tube brands

When using non-SMC brand tubes, refer to the Specific Precautions in the catalogue.

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.

shown in this section. Contact SMC for specific drawings.

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 Mounting

⚠ Caution

3.6.1 L type bracket mounting

Apply a tightening torque of 0.5 to 0.6 N·m to the bolts when the bracket is mounted on the body.

4 How to Order

Refer to catalogue for ‘How to Order’.

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.

⚠ Warning

- To prevent unexpected movements of the pneumatic actuator, the user shall consider the state of the valve before conducting maintenance (e.g., when the valve is left in the OPEN position).

6.2 Replacement parts

Refer to catalogue for bracket assembly part number.

7 Limitations of Use

⚠ Warning

The system designer should determine the effect of the possible failure modes of the product on the system.

7.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

7.2 Effect of energy loss on valve switching

- This product does not close by load pressure alone if the spring that closes the valve is damaged.
- If the valve is left in the OPEN position, it will remain in that position even when the energy source is interrupted. If the air supply is reconnected again, e.g., after maintenance, it may behave unexpectedly.

7.3 Intermediate stopping

This product cannot be used when intermediate stop is required.

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.

7.6 Safety related applications

This product shall not be used as an emergency shut-off valve or as any part of an emergency stop circuit.

7.7 Air supply

- For use with compressed air only. Do not use this product with a fluid other than compressed air (e.g. oxygen, hydrogen, inflammable gas, mixed gas, etc.).
- Use with air class [6:4:4] or higher as defined in ISO8573-1:2010 Compressed air – Part 1: Contaminants and purity classes.

7.8 Design

- Since the valve is a poppet type, fluid flows backward when the pressure on port 2 (A) rises.
- The 3-port valve discharges residual pressure from 2(A) with the knob set at SHUT. There is no exhaust port.

⚠ Caution

7.9 Low temperature operation

Unless otherwise indicated in the specifications for each valve, operation is possible to 0˚C, but appropriate measures should be taken to avoid solidification or freezing of drainage and moisture, etc.

7.10 Operation method

The valve must be switched to OPEN or SHUT instantly and securely. Stopping the knob halfway between the two positions may cause malfunction.

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)
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