



Installation and Maintenance Manual

VCH400 Series



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 (Notes), JIS B 8370 (Notes2) 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	EN 61000-6-2, EN55011
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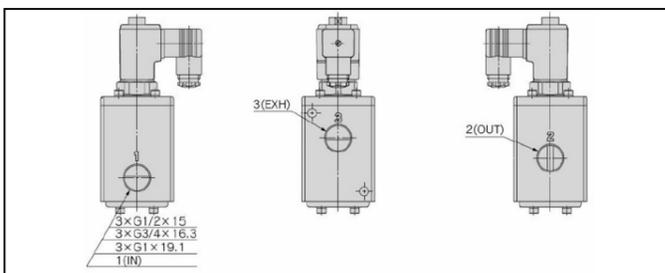
2 INTENDED CONDITIONS OF USE

2.1 Specifications

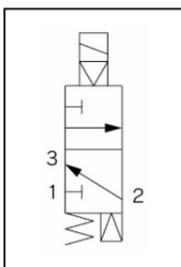
Model		VCH410	
Valve Construction	Pilot type poppet		
Fluid	Air, inert gas		
Orifice	Ø18		
C Value (effective area)	G ¹ / ₂ , 1-2:20dm ³ / (s-bar)(100mm ²)	G ³ / ₄ , 1 1-2:22dm ³ / (s-bar)(100mm ²)	
	2-3:22dm ³ / (s-bar)(110mm ²)	2-3:24dm ³ / (s-bar)(120mm ²)	
Max. Operating pressure	5.0 MP a		
Operating pressure difference	0.5~5.0 MPa		
Fluid temperature	-5~80°C		
Ambient temperature	-5~80°C		
Body material	Aluminium + Hard Alumite		
Main valve seal material	Polyurethane elastomer		
Enclosure	Splash proof (IP65 equivalent)		
Port size	G ¹ / ₂ , ³ / ₄ , 1 (conforms to IS1179-1: G thread for hydraulic & pneumatic equipment)		
Mounting position	Free		
Voltage	DC12V, 24V		
Allowable voltage fluctuation	±10% of rated voltage		
Electrical entry	DIN connector		
Coil insulation type	Class B		
Power consumption	5W(DC)		
Mass	G ¹ / ₂ , ³ / ₄ :1.83kg, G1:2.11kg		

Note1: If using as a selector valve (Ports 1, 3 pressurised) use within the range:
Port 1 pressure > Port 3 pressure x2

2.2 Piping



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)
G, Rc 1/2	28 to 30
G, Rc 3/4	28 to 30
G, Rc 1	36 to 38

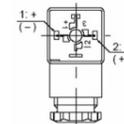
3.3 Electrical connection

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.
- Use electrical wire with a cross sectional area of 0.5 to 1.25mm² for wiring. Furthermore, do not allow excessive force to be applied to the wires.
- Use electrical circuits which do not generate chattering in their contacts.
- Use voltage which is within ±10% of the rated voltage. In cases with a DC power supply where importance is placed on responsiveness, stay within ±5% of the rated value. The voltage drop is the value in the lead wire section connecting the coil.
- When surge from the solenoid affects the electrical circuitry, install a surge absorber, etc., in parallel with the solenoid.

Din Connector

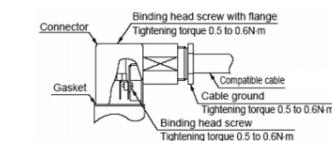
Since internal connections are as shown below for the DIN connector, make connections to the power supply accordingly.



Terminal no.	1	2
DIN terminal	+ (-)	- (+)

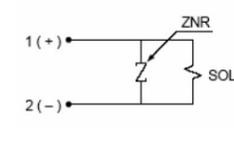
* There is no polarity.

- Use compatible heavy duty cords with cable O.D. of ø6 to 12.
- Use the tightening torques below for each section.



If using cable with outer diameter of 9-12mm, remove inner part of rubber seal before use.

DC circuit



3.4 Mounting

- If air leakage increases or equipment does not operate properly, stop operation.** After mounting is completed, confirm that it has been done correctly by performing a suitable function test.
- Do not apply external force to the coil section.** When tightening is performed, apply a wrench or other tool to the outside of the piping connection parts.
- Do not install the coil facing downwards.** If the coil is installed facing downwards, foreign matter in the fluid can become stuck to the core, causing malfunction.
- Avoid sources of vibration, or adjust the arm from the body to the minimum length so that resonance will not occur.**

3.5 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 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.

Removing the product

- Shut off the fluid supply and release the fluid pressure in the system.
- Shut off the power supply.
- Remove the product.

Low frequency operation

- Switch valves at least once every 30 days to prevent malfunction.

CAUTION:

Storage

- If storing for a long period of time after use, to prevent rusting or deformation of rubber materials, store in a moisture free environment.

Filters and strainers

- Flush drainage from air filters periodically.

5 LIMITATIONS OF USE

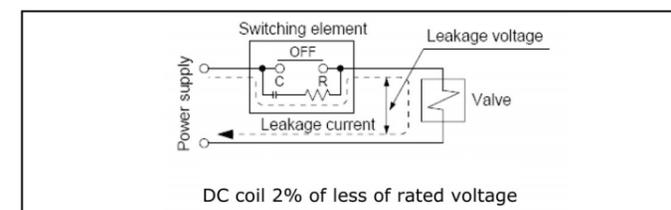
WARNING:

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

CAUTION:

Leakage voltage

- Particularly when using a resistor in parallel with a switching element and using a C-R element (surge voltage suppressor) to protect the switching element, take note that leakage current will flow through the resistor and C-R element, etc., creating a danger that the valve may not shut OFF.



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