



Installation and Maintenance Manual
VNH series, High Pressure
Coolant Valve
2 Port and 3 Port Solenoid



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 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 "DANGER", "WARNING" or "CAUTION", 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.

1 Safety Instructions (continued)

- 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 microns.

2 Intended Conditions of Use

2.1 Specifications

Applicable fluids	Coolant	
Fluid Temperature	-5 to 60°C (1)	
Ambient Temperature	-5 to 50°C (1)	
Proof Pressure	VNH*11*	5.5MPa
	VNH*13, VNH*33*	10.5MPa
Operation Pressure Range	VNH*11*	0 to 3.5MPa
	VNH*13, VNH*33*	0 to 7MPa
Pilot supply	Pressure Range	0.25 to 0.7MPa
	Lubrication	Not required
	Temperature	-5 to 50°C (1)
Coil Rated Voltage	Refer to marking on coil	
Coil Voltage Tolerance	-15% to +10% (of rated)	

Note 1) No freezing.

2.2 Piping (Fig. 1)

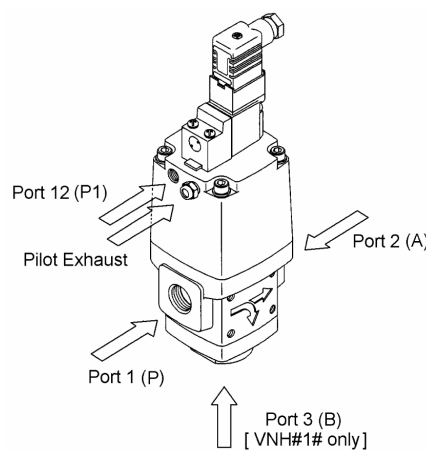
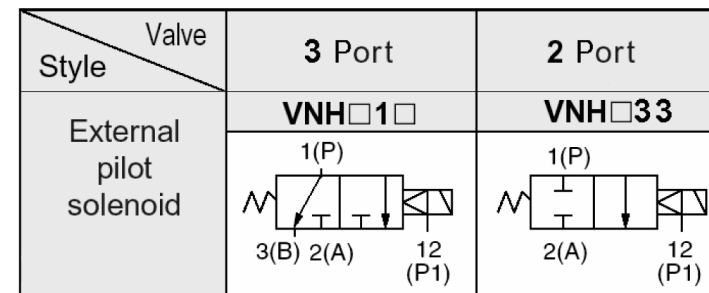


Fig. 1

VNH Series	Port 1(A), 2(B) Port 3 (B) [VNH□1□ only]	Port 12(P1) Pilot Exhaust
	Threaded Fitting size	Threaded Fitting size
VNH1□□ ^A _B - 10A	3/8	1/8
VNH2□□ ^A _B - 15A	1/2	1/8
VNH3□□ ^A _B - 20A	3/4	1/4
VNH4□□ ^A _B - 25A	1	1/4

2 Intended Conditions of Use (continued)

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.
- When high temperature fluids are used, use fittings and tubing with heat resistant features. (Self-align fittings, Teflon® tubing, Copper tubing etc.)

Thread	Appropriate tightening torque (Nm)
1/8	7 to 9
1/4	12 to 14
3/8	22 to 24
1/2	28 to 30
3/4	28 to 30
1	36 to 38

3 Installation (continued)

3.3 Electrical connection

CAUTION

- Isolate both power and air supplies before removing/replacing connector.
- When DC power is connected to a solenoid valve equipped with light and/or surge voltage suppressor, check for polarity indications.
- For polarity indications:
VNH valves have a diode to protect polarity: If the polarity connection is wrong then the valve will not switch. In addition to this, damage could be caused in the diode in the valve, the switching device at the control equipment or, the power supply.

DIN Connector: (see Fig. 2)

- Loosen the fixing screw and remove the connector housing from the terminal spades on the solenoid.
- Remove the housing screw and insert a screwdriver into the slot on the underside of the DIN cap and carefully remove the block.
- Insert the cable through the gland nut, washer, grommet and housing.
- Loosen the terminal screws on the block and insert the stripped ends of the leads. Secure each lead by re-tightening the appropriate terminal screw.
- Tighten the housing gland nut to secure the cable.
- Reassemble the DIN connector in reverse order of removal.

Connections for DIN connector are shown below;

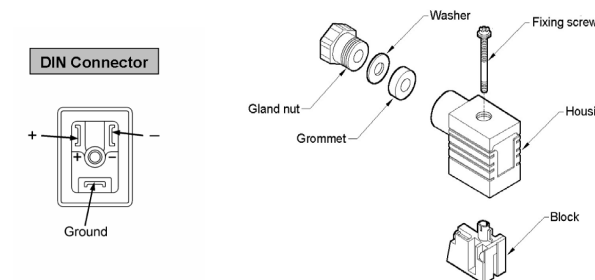


Fig. 2

3.4 Mounting

The VNH series can be mounted using a bracket (optional).

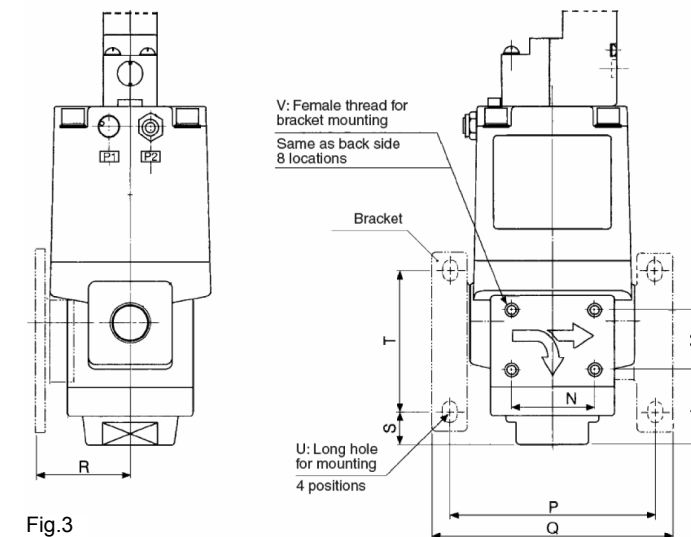


Fig.3

Model	L	M	N	P	Q	R	S	T	U	V
VNH1□□-10A	29	25	30	75	88	34	10.5	62	6 x 8	M5 x 0.8 depth 5.5
VNH2□□-15A	36	30	40	100	118	44.5	16	70	7 x 10	M6 x 1 depth 6
VNH3□□-20A	48	35	50	126	148	60.5	19.5	92	9 x 12	M8 x 1.25 depth 6
VNH4□□-25A	51	38	56	141	163	66.5	15.5	109	9 x 12	M8 x 1.25 depth 6

Thread	Appropriate tightening torque (Nm)
M5	3.0
M6	5.2
M8	12.5

CAUTION	If instructions are not followed there is a possibility of injury or equipment damage.
WARNING	If instructions are not followed there is a possibility of serious injury or loss of life.
DANGER	In extreme conditions, there is a possibility 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 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).
- **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.

3 Installation (continued)

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

4.1 Manual Override

WARNING

- Ensure conditions are safe, since connected equipment will operate when manual override is performed.
- Non-locking push type
Push on the manual override button using a small-bladed screwdriver until it stops ON.
Hold this position for the duration of the check (ON position).
Release the button and the override will re-set to OFF position.

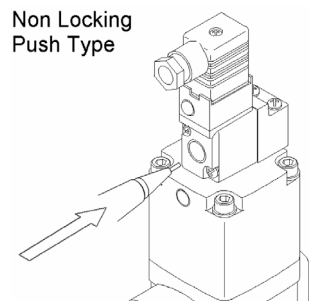


Fig. 4

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 make any modification to the product
- Do not disassemble the product, unless required by installation or maintenance instructions.

5 Maintenance (continued)

5.1 Replacing Spare Parts

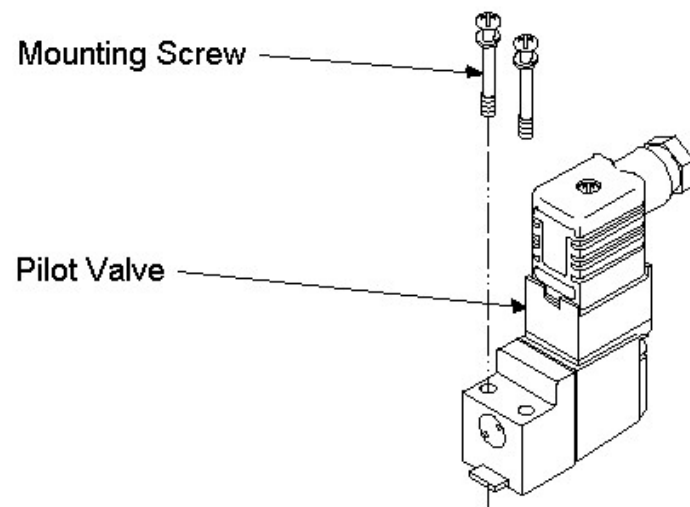


Fig. 5

5 Maintenance (continued)

Replacing Pilot Valve Assembly

VNH*1*, VNH*33 (see Fig. 5)

1. Remove pilot valve mounting screws.
2. Remove pilot valve (retain DIN plug if necessary).
3. Fitting of new pilot valve is reverse of removal (use correct tightening torque).

CAUTION

- Never remove inner circlip from valve.
- When replacing external pilot valve, ensure it is mounted in the correct direction. If mounted in the wrong direction, it may malfunction or leak air.

Tightening Torque (Nm)

Valve Size	VNH11*	VNH21*	VNH31*	VNH41*
Seal Mounting Nut	3	5.2	12.5	24.5
Piston Cover Mounting Screw	2.6	2.6	6.2	6.2
Pilot Valve Mounting Screw	0.76	0.76	0.76	0.76

Valve Size	VNH133	VNH233	VNH333	VNH433
Seal Mounting Nut	Not Applicable			
Piston Cover Mounting Screw	2.6	2.6	6.2	6.2
Pilot Valve Mounting Screw	0.76	0.76	0.76	0.76

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.

CAUTION

- Ensure back pressure of 3 (B) port of VNH#13 (3 port valve) is less than 5MPa.

Filters and strainers:

- Be careful regarding clogging of filters and strainers.
- Replace filter elements after one year of use, or earlier, if the pressure drop reaches 0.1MPa.
- Clean strainers when the pressure drop reaches 0.1Mpa.

Lubrication - Pilot air line:

- Once lubrication has begun, lubrication must be continued.

Drain flushing:

- Remove drainage from air filters regularly. (Refer to the specifications).

7 Contacts

AUSTRIA	(43) 2262 62280	NETHERLANDS	(31) 20 531 8888
BELGIUM	(32) 3 355 1464	NORWAY	(47) 67 12 90 20
CZECH REP.	(420) 541 424 611	POLAND	(48) 22 211 9600
DENMARK	(45) 7025 2900	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	SLOVAKIA	(421) 2 444 56725
FRANCE	(33) 1 6476 1000	SLOVENIA	(386) 73 885 412
GERMANY	(49) 6103 4020	SPAIN	(34) 945 184 100
GREECE	(30) 210 271 7265	SWEDEN	(46) 8 603 1200
HUNGARY	(36) 23 511 390	SWITZERLAND	(41) 52 396 3131
IRELAND	(353) 1 403 9000	UNITED KINGDOM	(44) 1908 563 888
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