



**Installation and Maintenance Manual**  
**VNC series, 2 Port Coolant Valve**  
**External Solenoid or Air operated**



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**

**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 - General rules relating to systems.

Note 2: JIS B 8370: Pneumatic system axiom.

<b>⚠ DANGER</b>	In extreme conditions, there is a possible result of serious injury or loss of life.
<b>⚠ WARNING</b>	Operator error could result in serious injury or loss of life.
<b>⚠ CAUTION</b>	Operator error could result in injury or equipment damage.

**⚠ 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:

Directive	Standard
Electromagnetic Compatibility:	EN61000-6-2 EN55011

**2 Intended Conditions of Use**

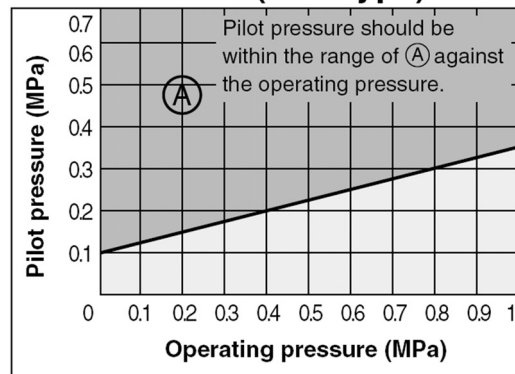
**2.1 Specifications**

Applicable fluids		Coolant	
Fluid Temperature	VNC***A	-5 to 60°C(1)	
	VNC***B	-5 to 99°C (1) (Air Operated)	
Ambient Temperature		-5 to 50°C (1) (Air Operated:60°C)	
Proof Pressure		1.5MPa	
Operation Pressure Range	VNC**1*	0 to 0.5MPa	
	VNC**2, VNC**4*	0 to 1MPa	
Pilot Supply	Pressure Range	VNC**1*, VNC**4*	0.2 to 0.7MPa
		VNC**2*	See Applicable Pressure Graph 1
	Lubrication	Not required	
Temperature		-5 to 50°C (1) (Air Operated:60°C)	
Coil Rated Voltage		Refer to product label	
Coil Voltage Tolerance		-15% to +10% (of rated)	

Note 1) No freezing.

**Applicable Pressure Range**

**VNC□□2□ Pilot Pressure (N.O. type)**



**Graph 1**

**2.2 Piping (Fig. 1)**

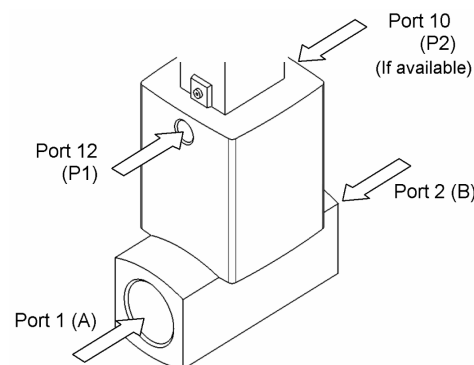


Fig. 1

VNC Series	Port 1(A), 2(B)	Port 12(P1) Port 10(P2) (If available)
	Threaded Fitting size	Threaded Fitting size ( Rc )
VNC1□□□ - 6A	1/8	1/8
VNC1□□□ - 8A	¼	1/8
VNC1□□□ - 10A	3/8	1/8
VNC2□□□ - 10A	3/8	1/8
VNC2□□□ - 15A	½	1/8
VNC3□□□ - 20A	¾	1/8
VNC4□□□ - 25A	1	1/8
VNC5□□□ - 32A	1¼	1/8
VNC6□□□ - 40A	1½	¼
VNC7□□□ - 50A	2	¼

**2.3 Circuit Symbols**

**JIS Symbol**

Type	Valve type	N.C.	N.O.
		Normally closed	Normally open
Air operated	<b>VNC□0¼□</b>		
	<b>VNC□1¼□</b>		
External pilot solenoid	<b>VNC□02□</b>		
	<b>VNC□12□</b>		

**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)
Rc(PT) 1/8	7 to 9
Rc(PT) ¼	12 to 14
Rc(PT) 3/8	22 to 24
Rc(PT) ½	28 to 30
Rc(PT) ¾	28 to 30
Rc(PT) 1	36 to 38
Rc(PT) 1¼	40 to 42
Rc(PT) 1½	48 to 50
Rc(PT) 2	48 to 50

**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.

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;

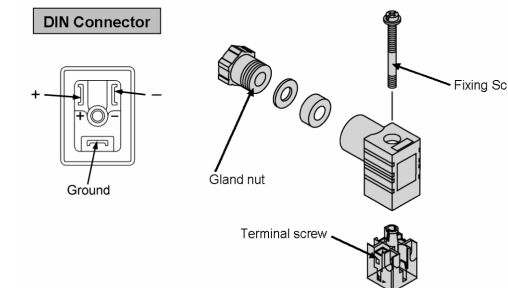
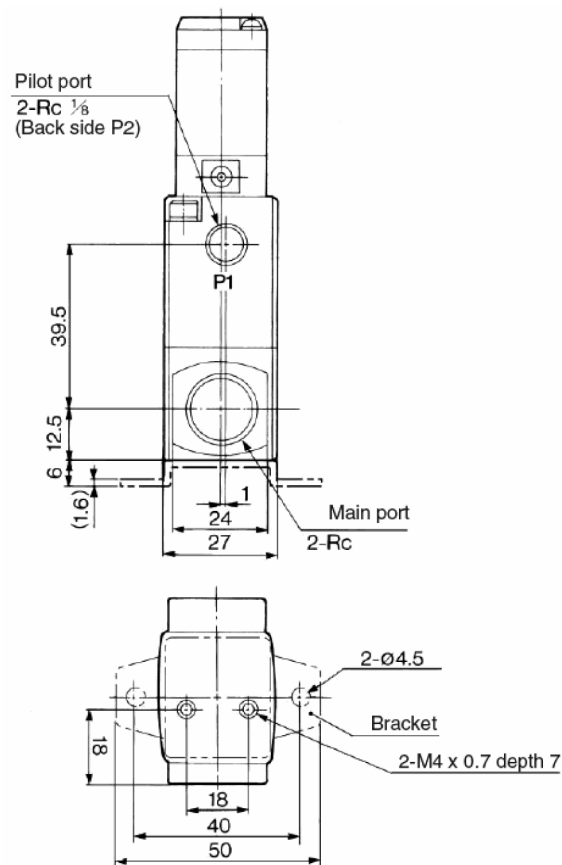


Fig. 2

**3.4 Mounting**

Valve series 1,2 3 and 4 can be mounted using a bracket (optional)



**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 (see Fig. 3 and Fig. 4)  
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.

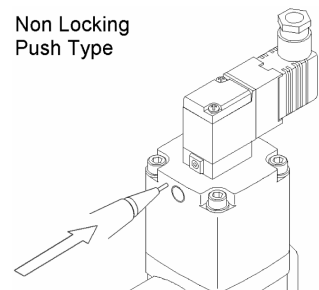


Fig. 3

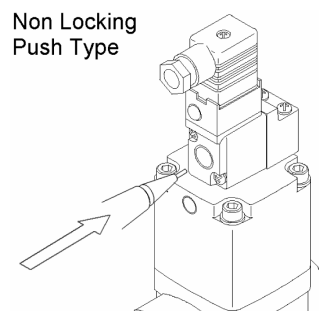


Fig. 4

- Push-locking slotted type (see Fig. 5)
- To lock  
Using a small-bladed screwdriver in the slot, push the manual override button until it stops.  
Turn the override button 90° in the direction of the arrow until it stops (ON position).  
Remove the screwdriver.

**WARNING**

- In this position the manual override is in the locked 'ON' position.
- To unlock  
Place a small-bladed screwdriver in the slot and push the manual override button.  
Turn the override button 90° in the reverse direction of the arrow.  
Remove the screwdriver and the manual override will re-set to the OFF position.

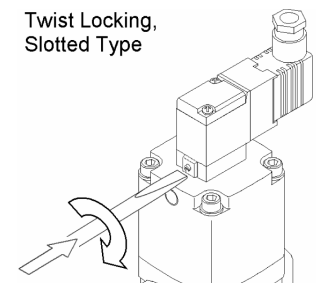
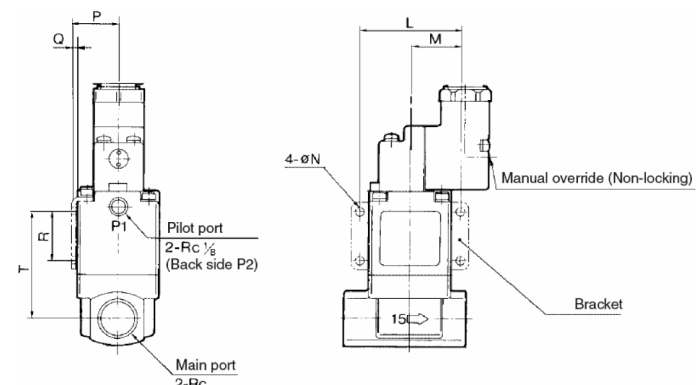


Fig. 5



Model	Main port Rc	L	M	N	P	Q	R	T
VNC2□□□-10A	3/8	52	26	4.5	24.3	2.3	25	55
VNC2□□□-15A	1/2	52	26	4.5	24.3	2.3	25	55
VNC3□□□-20A	3/4	62	31	5.5	28.3	2.3	30	60.5
VNC4□□□-25A	1	72	36	6.5	33.3	2.3	35	73

Thread	Appropriate tightening torque (Nm)
M4	1.5
M5	3.0
M6	5.2

**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.

**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.

**Replacing Pilot Valve Assembly (see Fig. 6)**

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	VNC1	VNC2	VNC3	VNC4	VNC5	VNC6	VNC7
Seal	Not Applicable						
Mounting Nut	Not Applicable						
Piston Cover Mounting Screw	0.76	0.76	1.5	2.6	2.6	6.2	6.2
Pilot Valve Mounting Screw	0.315	0.76	0.76	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**

Pilot port P1 and P2 piping:

- P1 and P2 piping is as follows according to the valve model.

Port	Air operated		Solenoid
	VNC□0 <sup>1</sup> / <sub>4</sub> □	VNC□02□	VNC□1 <sup>1</sup> / <sub>2</sub> □
12 (P1)	External pilot	Bleed port	External pilot
10 (P2)	Bleed port	External pilot	Pilot exhaust

- Installing a silencer to the exhaust port and the bleed port is recommended for noise reduction and for prevention of dust ingress.

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**

<b>AUSTRIA</b>	(43) 2262-62 280	<b>ITALY</b>	(39) 02-92711
<b>BELGIUM</b>	(32) 3-355 1464	<b>NETHERLANDS</b>	(31) 20-531 8888
<b>CZECH REP.</b>	(420) 5-414 24611	<b>NORWAY</b>	(47) 67 12 90 20
<b>DENMARK</b>	(45) 70 25 29 00	<b>POLAND</b>	(48) 22-548 50 85
<b>FINLAND</b>	(358) 207-513 513	<b>PORTUGAL</b>	(351) 2 610 89 22
<b>FRANCE</b>	(33) 1-64 76 1000	<b>SPAIN</b>	(34) 945-18 4100
<b>GERMANY</b>	(49) 6103 4020	<b>SWEDEN</b>	(46) 8-603 0700
<b>GREECE</b>	30) 1- 342 6076	<b>SWITZERLAND</b>	(41) 52-396 3131
<b>HUNGARY</b>	(36) 1-371 1343	<b>TURKEY</b>	(90) 212 221 1512
<b>IRELAND</b>	(353) 1-403 9000	<b>UNITED KINGDOM</b>	(44) 1908-56 3888

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**5.1 Replacing Spare Parts**

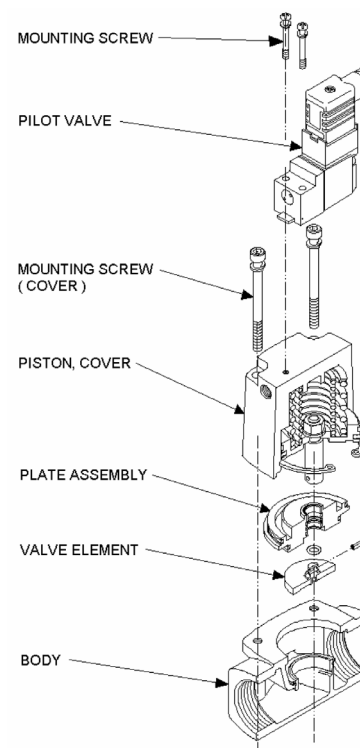


Fig. 6

**Replacing Plate Assembly and valve element (see Fig. 6)**

1. Remove body mounting screws.
2. Apply sufficient air pressure to pilot port to release plate assembly.
3. Slide pin out and remove valve element.
4. Slide off valve element, valve cover (or O-ring) and plate assembly.
5. Refitting is reverse of removal.