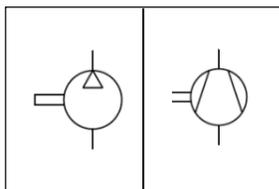




ORIGINAL INSTRUCTIONS

Instruction Manual Compact Compressor CRP10-##-##



The intended use of the CRP series provides a low flow pressure or vacuum source to be used locally.

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 relating to systems.
ISO 4413: Hydraulic fluid power - General rules relating to systems.
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

- The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

- Only personnel with appropriate training should operate machinery and equipment.**

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

- Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

1 Safety Instructions – continued

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

- Our products cannot be used beyond their specifications. Our products are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not covered.**

Conditions and environments outside of the given specifications or use outdoors or in a place exposed to direct sunlight.

Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.

Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

2 Specifications

2.1 Compressor specifications

Compressor Specifications	
Compression method	Reciprocating (oil free)
Max. discharge/ vacuum pressure	0.55 MPa/ -70kPa
Max. discharge/ vacuum flow rate	10 l/min (ANR)
Pressure ratio	6.5
Motor speed	1500 min ⁻¹
Unloader method	Digital pressure switch

Duty cycle	Continuous
Noise ^{Note 1)}	AN10-01: 62dB or less ANB1-01: 55dB or less
Sound pressure level ^{Note 2)}	AN10-01: 63dB or less ANB1-01: 62dB or less
Sound power level ^{Note 2)}	AN10-01: 74dB or less ANB1-01: 73dB or less
Operating temperature range	5 to 40°C
Operating humidity range	80% RH or less (no condensation)
Weight	3.1 kg

Table 1.

Note 1) Reference values based on a position 1 m away from the intake port in an anechoic chamber at positive pressure.

Note 2) Reference values in according to ISO 2151

2.2 Controller specifications

Controller Specifications		
Installation	Separation	
Power supply	DC24V±10% ^(note3)	
Rated current	4.5 A	
Instantaneous current consumption	Max. 8A	
LED Display	Function	Status
	POWER (green)	POWER ON:Light
Pressure switch input	ALARM (red)	Alarm: Light or flashing
	IN (Input for Pressure switch) 1 PNP input Input current 3.5mA±20% at DC24V COM+, COM- (Power supply output for Pressure switch) DC24V+10%-15%, Max. supply current 200mA	

2 Specifications - continued

Pressure switch compatible part number	High-Precision Digital Pressure Switch ISE20 series PNP open collector output type ISE20A-Y-#-#-J-X603
Mounting	Screw mounting / DIN-rail mounting
Cable length	1m or less
Cooling system	Natural air cooling
Operating temperature range	5 to 40°C
Operating humidity range	90%RH or less (No condensation)
Insulation resistance	Between batch of external terminals and case 50MΩ (DC500V)
Weight	Screw mounting 340g DIN rail mounting 360g

Table 2.

Note3) In case of power supply has overcurrent protection function, Automatic recovery type and constant current type are adequate.

2.3 Design Selection

Danger

- Use this product only for general industrial applications.** Do not use for any life-supporting applications such as respiratory equipment. Any damage to this product **may result in a critical accident.**
- Do not intake and compress fluids other than air.** It could lead to fire or explosion.
- Do not install the product in an environment containing flammable gas, explosive gas, the organic solvents, explosive dust or corrosive gas.** It may cause fire or explosion.
- This product (compressor and controller) does not have a waterproof structure.**

Do not use this product in an area where it could get wet, or in environments of high humidity and heavy condensation. This may cause an electric shock, earth leakage, or fire.

- Do not disassemble the product or make any modifications.** It may cause human injury and/or an accident.

Warning

The caution label shown below is attached to this product. Read and understand the warnings to ensure work safety.



The product becomes hot during operation. Touching it may cause burn injuries. In addition, residual heat after turning off the power may cause burn injuries. Avoid touching the product until it has cooled down sufficiently.



This product controls the pressure with the help of the pressure sensor and performs stopping and starting (unloading and loading) operations. During operation, avoid contacting the product.



Install and operate this product only after reading the Operation Manual carefully and understanding its contents.

2 Specifications - continued

The product contains a fan and parts that rotate at high speeds during operation. There is a risk of fingers or hand being cut or getting caught by rotating objects. Avoid touching the product during operation.

- When using this product in critical applications, make sure to provide a spare device or auxiliary equipment.**

This prevents damage when the operation is stopped due to failure or activation of the safety system.

- Do not install these products in environments rich in corrosive gases such as ammonia, acids, salts, ozone gas, sulfurous gas, etc.**

It may cause rusting, reduced product lifespan and damage.

- Overcurrent protection**

Install a circuit breaker that complies with EN60947-2 with a rated current of 6 A and B type trip curve.

- Install an emergency stop pneumatic circuit.**

Install an emergency stop circuit in accordance with EN 60204-1 using an appropriate electrical disconnection device (complying with the required standards) to remove the electrical power and an appropriate device to vent the pneumatic pressure safely. Pay particular attention to the current rating of the disconnection device that shall be able to break a current up to 30 A safely. The pneumatic venting device should meet the required vent capacity appropriate to the system volume and required discharge time and be silenced to the required level.

- Consider emergency stops.**

Design the system to avoid human injury and/or damage to machinery and equipment when the machinery is stopped by a safety device under abnormal conditions, such as a power outage or a manual emergency stop.

- Consider the whole system.**

Design the system to avoid human injury or equipment damage during the restart operation of the whole system.

- To avoid inadvertent supply of electric power and compressed air while the equipment is stopped, install a device equipped with a locking functionality.**

- Make sure to connect the outlet of the PNP-type digital pressure switch to the PNP terminals on the controller. This product controls the pressure to unload / load by connecting the digital pressure switch to the controller.**

To ensure that the pressure does not exceed the specification range, set the pressure switch, and install a pressure regulating valve. Use of this product with pressure outside the specified operating range may reduce the lifespan or damage the product.

- Install a pressure switch separately.**

This product is not fitted with a pressure relief valve. Therefore, use a pressure switch of the required ISO 13849-1 performance level to operate the pneumatic venting device to the required Performance Level as selected from the risk assessment. (Ref ISO 12100 and ISO 13849-1)

Caution

- Use the product in an area that is free of dust.**

Presence of dust may reduce life or cause product failure due to abnormal wear and other factors.

- Use the product at an ambient temperature between 5°C and 40°C during operation.**

Use of the product outside this temperature range may reduce life or cause product failure. In addition, the temperature protection system may activate to prevent motor burnout and stop the operation.

When using the product in close proximity to a heat source or in an enclosed space consider methods to cool and ventilate to maintain the ambient temperature at 40°C or less.

- Depending on the operating conditions, the surface temperature of the product may reach up to approx. 90 to 100°C and the discharged air temperature may be up to approx. 70°C. Confirm that the generated heat does not affect the surroundings.**

2 Specifications - continued

- Provide measures to treat the drain according to the use of compressed air.

This product does not use any lubricating oil during the compression process. However, the compressed air generated contains a drain made of impurities such as moisture, oil content, dust, and wear particles from the atmosphere.

Make sure to consider methods of treating this drain as it may cause malfunction if it flows into pneumatic equipment such as cylinders.

2.4 Compliance

• EMC Directive/Regulations

This product conforms to the applicable CE/UKCA EMC Directive/Regulations as stated on the Declaration of Conformity when used on its own in accordance with the instructions.

When installed in the finished machine, the conformity with the applicable CE/UKCA EMC Directive/Regulations shall be confirmed before putting into service.

• Machinery Directive/Regulations

This product is partly completed machinery under the CE/UKCA Machinery Directive/Regulations and has been supplied with a Declaration of Incorporation.

When installed in the finished machine, the conformity with the applicable essential health and safety requirements of the CE/UKCA Machinery Directive/Regulations shall be confirmed.

3 Installation

- Do not install the product unless the safety instructions have been read and understood.

3.1 Compressor installation

⚠ Warning

- Air intake and heat exhaust functions use a fan to cool down the compressor. Ensure a clearance of 30mm or more from the installation surface, 30mm or more around the product, and enough space for maintenance.

- Use M6x1 stud bolts and M6 nuts for fastening the product to the installation surface.
- Use anti-vibration rubber if a large amount of vibrations are transferred to the embedded surface. See figure 1. for reference.
- When using a stud bolt, tighten the nut with a torque of between 5.2 and 7.3 N·m. When using an anti-vibration rubber, fasten it according to its specification.
- Connect the grounding cable to the compressor to shield the brushless motor from electric noise. Use M3 x 0.5 screws. See Figure 2.

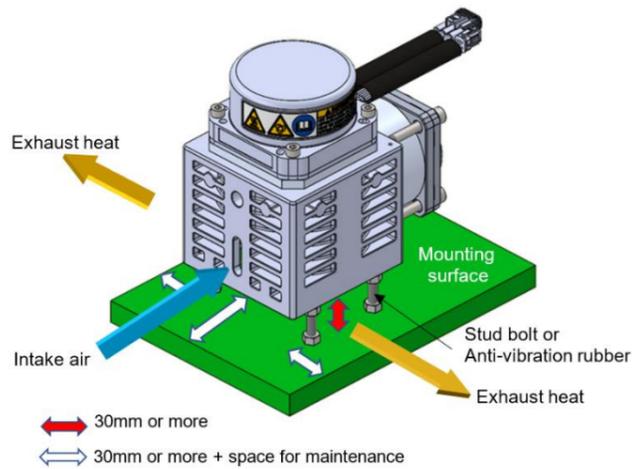


Figure 1

3 Installation - continued

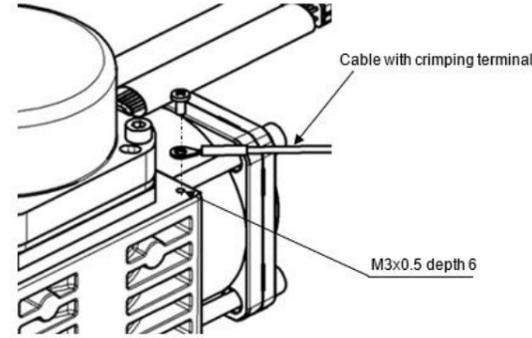


Figure 2

3.2 Controller installation

3.2.1 Screw mounting

Mount the controller into a flat surface using four M4 screws.

3.2.2 DIN-rail mounting

- Mount the DIN rail bracket assembly (AXT802-2A-1, AXT802-3A-1) on to the controller using M3x6 screws supplied with the product (use tightening torque of 0.4Nm).
- Mount the controller onto the DIN rail plate using M4 screws supplied with the DIN rail mounting bracket assembly (use tightening torque of 0.6Nm). See Figure 3.

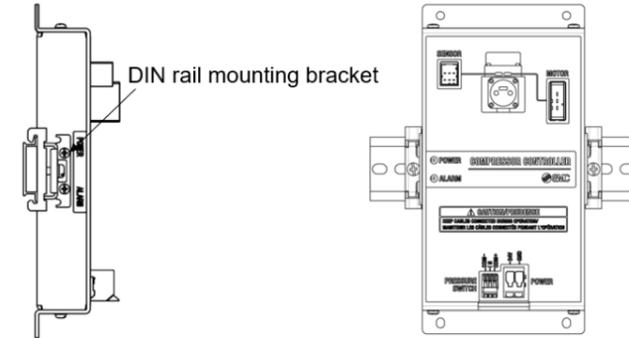


Figure 3

3.2.3 Ground wire connection

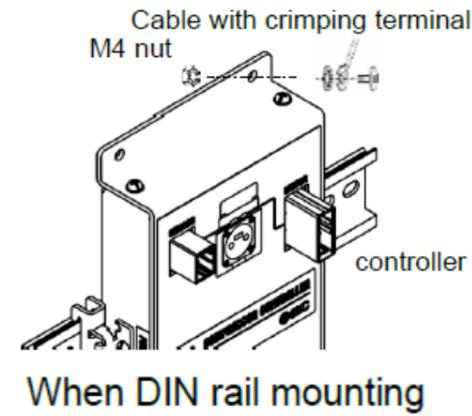
Connect the grounding cable with any of the screws used in mounting the controller to any of the four screw holes of the controller. Note that M4 nuts need to be obtained separately when using the DIN rail mounting. See below for examples of both mounting types.



When Screw mounting

Figure 4

3 Installation - continued



When DIN rail mounting

Figure 5

⚠ Caution

- The M4 screw, cable with crimping terminal, toothed lock washer, M4 nut should be obtained separately.
- Ground the controller to shield it from electric noise.

⚠ Caution

- The earthing should be the dedicated grounding point for functional grounding.
- The cross section of the grounding wire should be greater than 2mm².
- The ground point should be near this controller to make the wire length shorter. See Figure 6. below for reference.

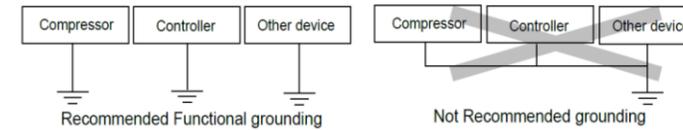


Figure 6

3.3 Mounting location

- Design the size of the control panel and the installation so that the temperature surrounding the controller is 5 to 40°C or less. Allow 60 mm minimum space between the front of the controller and the door (lid) so that connectors can be connected and disconnected.
- Avoid mounting the controller near a vibration source, such as a large electromagnetic contactor or circuit breaker on the same panel. See Figure 7.

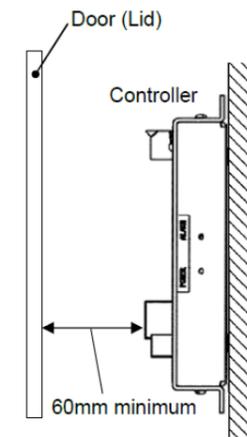


Figure 7

3 Installation – continued

⚠ Caution

- If the mounting surface for the controller is not flat or is uneven, excessive stress may be applied to the enclosure, which can cause failure. Be sure to mount on a flat surface.

⚠ Warning

- Installation, inspection, or wiring should be conducted after the power supply to this product has been turned off. Failure to do so may result in electrical shock, malfunction, or damage.
- Before modifying or checking the wiring, the voltage should be checked with a tester 5 minutes after the power supply has been turned off. Failure to do so may result in electrical shock.
- Maintenance space
Reserve sufficient space for maintenance and wiring.
- Install the compressor body in an area with a solid surface and fasten it in place firmly.
Any displacement by vibration during operation may cause injury or product damage.
- The acceleration produced when the compressor is installed on a mounting frame with a weight of 1.9 kg and dimensions of 300 x 380 mm and then operated is 0.80 G (reference value).
- The acceleration produced when the compressor is installed on a mounting frame with a weight of 9.4 kg and dimensions of 500 x 700 mm and then operated is 0.21 G (reference value).
- Do not carry the product by holding its cables.
It may cause an injury or damage to the product.
- Shade the product from direct sunlight.
- If the vibration transferred to the embedded structure deemed large, provide appropriate vibration-proof treatment when fastening the product.
Vibration may transfer to the structure and increase the noise level.

3.4 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.

3.5 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.
- Tighten fittings to the specified tightening torque.

⚠ Warning

- Start-up of this product may be unstable or disabled while it is still pressurized.
Attempting to start the product with any pressure inside may cause the start-up to be unstable or disabled.
To avoid this, prepare the pneumatic circuit to allow the exhaust of any residual pressure into the atmosphere before restarting the product. Figure 8 provides an example pneumatic circuit to be used.

3 Installation – continued

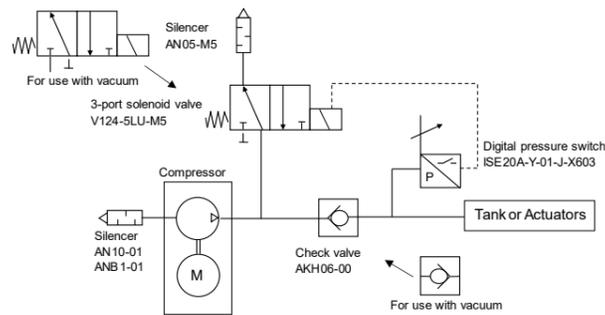


Figure 8

See the catalog and operation manual of the ISE20 series for piping, mounting, and details of other option parts for the digital pressure switch ISE20A-Y-01-J-X603.

- **Make sure to mount a silencer to the inlet port.** This will reduce the noise and prevent intrusion of any foreign matter.
- **Use piping materials that can accept the rise in temperature that can result from use of this product.**

3.6 Wiring

Warning

- **Do not connect wires while power is being supplied.** It may cause the controller to break or its peripheral devices could be damaged, causing a malfunction.
- **Before wiring, check that the power supply has sufficient capacity, and that the voltage is at the specified value.**
- **Never disassemble the cable. Use only the specified cables.**
- **Never connect or disconnect the cable or connector with the power on.**
- **Do not perform the operation or setting of the product with wet hands.** Doing so may cause an electric shock.

- **Operate with cables such that they are not easily moved.** Avoid contact with this compressor.
- **Avoid twisting, folding, rotating, or applying external force to the cable.** Electric shock, wire breakage, contact failure, or a loss of product control may occur.
- **In case of power supply has overcurrent protection function, Automatic recovery type and Constant current type are adequate.**

Caution

- **When plugging or unplugging the cable connector, release the detachment prevention mechanism while manually supporting the plug. Connect or disconnect the connector in the same direction as the connector pin to prevent the application of excessive force.** It may cause malfunctions.
- **Wiring should be done correctly. For each terminal, voltages other than those stipulated in the operation manual should not be applied.**
- **Connect the connector securely.** Check for correct connector wiring and polarity.
- **Be sure to carry out grounding in order to ensure the noise tolerance.** The ground points should be near the compressor or the controller to make the wire length shorter.

3.7 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.

4 Settings

4.1 Pressure switch setting

- This product controls the pressure and performs stop / start (unload / load) by connecting the pressure switch to the controller.
- Use the designed setting when transmitting the output of the pressure switch to PLC and receiving from the PLC to the controller.
- Recommended pressure switch product number: ISE20A-Y-*-*-*J-X603

Supply 24 VDC power source to the controller and the pressure switch. Currently, do not connect to IN. See Figure 8.

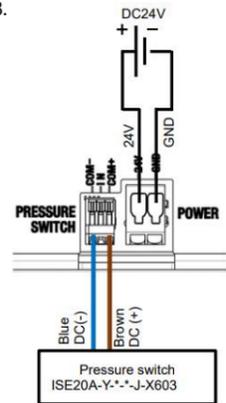


Figure 9

Caution

- In case of power supply has overcurrent protection function, Automatic recovery type and Constant current type are adequate.
- Reverse connection of supply power voltage may result in a malfunction.

5 Alarm details

The alarm LED will turn on or start to flash when an alarm shown below is generated with the controller. If the cause of the alarm is solved when turning on the power supply again, the alarm LED will turn off and the product will be operable.

Alarm Type	Description	LED
Overheating failure (controller)	The internal temperature of the controller exceeded the specified value.	<<Flashing>>
	The internal temperature decreased while the alarm LED was flashing and has cooled enough to allow operation again.	ON
Overheating failure (motor)	The internal temperature of the compressor exceeded the specified value.	<<Flashing>>
	The internal temperature decreased while the alarm LED was flashing and has cooled enough to allow operation again.	ON

5 Alarm details - continued

Abnormal power supply voltage	Abnormal power supply voltage for driving the compressor.	ON
Overcurrent	The current from the power supply for driving the compressor exceeds the specified value.	ON
Overspeed	The motor speed of the compressor exceeds the specified value.	ON
Compressor stop time exceeded	The compressor stopped operating and exceeded the specified time limit.	ON

Caution

Cautions after an alarm is generated.

- The controller and the compressor may be hot when an overheating failure occurs. Pay attention to avoid burns or other injuries. It is possible to restart the operation by turning on the power supply again when the temperature is decreased and the alarm LED stops flashing and is constantly turned on.
- The condition of the cables, the connections, or the 24 VDC power supply voltage may be the cause when an alarm for abnormal power supply voltage, excessive voltage, or exceeding compressor stop time is generated. Check the wiring condition and 24 VDC power supply voltage before turning on the power supply again.
- There is a possibility of failure when an alarm is re-displayed after turning on the power supply again.

Turn off the power supply immediately. In addition, be aware that there is a risk of failure when the power supply is turned on repeatedly without solving the cause of the alarm.

6 Troubleshooting

Phenomenon	Alarm	Possible causes	Countermeasures
The product does not start	LED ON	Pressure is remaining in the compressor.	Configure a pneumatic circuit that can release residual pressure. Check that the solenoid valve for releasing residual pressure is operating normally.
		Incorrect setting of the pressure switch	Check the setting of the pressure switch.
		Incorrect wiring	Check the wiring and connection.
		Power source abnormality, over current, over voltage	Check the wiring and connection. Check that the power source current is satisfying the specifications. In addition, check that there is no failure or other abnormalities.

7 Troubleshooting - continued

Overheating failure	LED ON	Increase in ambient temperature such as ambient heat source and sealing.	Investigate the cause of temperature increase and solve the issue. Cool it down until the alarm LED starts blinking and turn the power source on again.
Pressure drop	N/A	Clogging of the silencer	Replace the silencer.
		Deterioration of internal components	The product requires repair because components need to be replaced.
		Water accumulates inside	Mount the compressor at an elevated position of the system. Periodically perform flushing.

8 How to Order

Refer to drawings or catalogue for 'How to Order'.

9 Outline Dimensions

Refer to drawings or catalogue for outline dimensions.

10 Maintenance

- **This product cannot be disassembled. Therefore, when it needs to be repaired, contact your distributor.**

11 Limitations of Use

11.1 Limited warranty and disclaimer/compliance requirements
Refer to Handling Precautions for SMC Products.

Caution

Machinery Directive 2006/42/EC

This product is regarded as a "Partly completed machinery" to be incorporated into the final machine. Partly completed machinery is only intended to be incorporated into or assembled with other machinery or other partly completed machinery or equipment, thereby forming machinery to which the Machinery Directive applies. Therefore, it is not possible to determine compliance with the Machinery Directive on the component alone, as the compliance of the final machine into which it is incorporated depends on the customer's installation on the machine. In addition, the partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of this Directive.

11.2 Handling

Warning

- **If a danger of human injury is expected due to abnormal heat generation, smoking, ignition, etc., of the controller and its peripheral devices, cut off the power supply of the product and the system immediately.**
- **Do not operate in series or apply pressure to the inlet port.** The discharge pressure will exceed the specifications and may cause damage or accidents.

11 Limitations of Use – continued

- **When using in an environment with high humidity, regularly perform flushing and discharge the condensed water to prevent accumulation of condensed water inside the product.**

Otherwise, the performance will significantly deteriorate.

Caution

- **Do not switch the suction and exhaust ports to change from a positive pressure (compressor) application to a negative pressure (vacuum pump) application.**

The performance will be significantly reduced. This warning also applies in the opposite situation.

- **Do not use this product at an altitude of 1000 m or higher.**

The product's performance will be degraded due to the decrease in air density.

12 Storage

- Do not store the product in a place in direct contact with rain or water drops or where it is exposed to harmful gas or liquid.
- Store in an area that is shaded from direct sunlight and has a temperature and humidity within the specified range (10°C to 30°C and 35 to 85% no condensation or freezing).

13 Product Disposal

The disposal of the product must be handled by a specialized industrial waste disposal agency in accordance with the relevant local laws and regulations.

14 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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