IZ-TF2Z277EN

ORIGINAL INSTRUCTIONS

Instruction Manual
Ionizer - Nozzle type
IZN10 Series

The intended use of this product is to neutralize charged objects.

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.

⚠ **Caution**	Indicates a hazard with a low level of risk, which if not avoided, could result in minor or moderate injury.
⚠ **Warning**	Indicates a hazard with a medium level of risk, which if not avoided, could result in death or serious injury.
⚠ **Danger**	Indicates a hazard with a high level of risk, which if not avoided, will result in death or serious 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

- Ensure that the air supply system is filtered to 5 microns.

2 Specifications

2.1 Ionizer Specifications

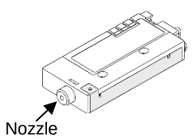
Model		IZN10-# (NPN)	IZN10-#P (PNP)
Ion generation method		Corona discharge	
Method of applying voltage		High frequency AC type	
Applied voltage		±2.5 kVAC	
Offset voltage		Energy saving nozzle: ±10 V High flow rate nozzle: ±15 V	
Air purge	Fluid	Air (clean dry air)	
	Operating pressure	0.05 to 0.7 MPa	
	Tube O.D.	ø 6 mm, ø1/4 inch	
Power supply voltage		24 VDC ±10%	
Current consumption		80 mA or less	
Input signals	Voltage	Connected to 0 V. 5 VDC max.	Connected to +24 V. 19 to 24 VDC
	Current consumption	5 mA max.	
Output signals	Load current	40 mA max.	
	Residual voltage	1 V or less	
	Applied voltage	28 VDC max.	-
Effective static neutralization distance		20 to 500 mm	
Ambient temperature		0 to 55°C (no freezing)	
Ambient humidity		35 to 65% RH (no condensation)	

3 Installation

3.1 Installation

⚠ Warning

- Do not install the product unless the safety instructions have been read and understood.
- **Install only where there is adequate space for maintenance, piping and wiring.**
  When installing the electrical connector and one touch pneumatic fitting, ensure sufficient room is left for easy insertion and removal of electrical cable and pneumatic tube.
  Do not install with sharp bends in the cable or tube. With consideration of the minimum bend radius given below, ensure that cable and tube entries are straight, and do not apply stress to the electrical connectors or pneumatic fittings. If the connectors or fittings are subject to mechanical stress, malfunctions such as broken wires, air leaks or fire may occur.
  Minimum bending radius: Power supply cable · 35 mm
  Note: This is the minimum bend radius at 20°C. If installation is at a lower temperature, the values will be greater.
  Refer to specific catalogue for the minimum bend radius of the pneumatic tube.
- **Install only on a flat surface.**
  A curved or uneven mounting surface may cause excessive force to be applied to the frame or case. This force, as well as a heavy impact (e.g. from dropping the ionizer) may result in damage and failure.
- **Do not use in areas subject to electrical noise.**
  It may cause malfunction, deterioration or damage to internal components. Take measures to prevent noise at source and avoid power and signal lines from coming into close contact.
- **Tighten with the specified torque.**
  If the tightening torque is exceeded the mounting screws and brackets may be broken. If the tightening torque is insufficient, the mounting screws and brackets may become loose.
  Recommended tightening torque for M3 screws 0.61 to 0.63 N•m.
- **Do not touch the emitters directly, by hand or with a metal tool.**
  If the emitters are touched by hand or with a metal tool, not only may it interfere with the specified function and performance of the ionizer, but may also cause operational failure or an accident.



⚠ Caution: High voltage

High voltage is applied to the emitter. Never touch the electrodes. Inserting foreign matter into the cartridge or touching the electrode may cause electrical shock and instantaneous rapid body motion to escape from the shock. Your body may then impact the equipment around you, causing injury.

- **Do not apply tape or seal to the product.**
  If conductive adhesive or reflective paint is contained in the tape or seal, it is possible that due to the dielectric effect, charge could build up causing an electro-static discharge or electrical leakage.
- **Ensure that both the power supply and compressed air supply are disconnected before commencing with the installation.**
- **Keep the minimum free space of 100 mm, around the Ionizer for correct operation, installation and maintenance.**
  Walls or other objects that are present within the minimum free space area can interfere with the operation of the ionizer, reducing the efficiency of static charge removal.
- **Be sure to check the effect of static neutralization after installation.**
  The effectiveness of static charge removal varies depending on the installation and operating conditions.

3.1.1 Precautions for Installation

- Investigate the places where static problems occur, or places where processes and parts generate ESD (electro-static discharge), and carefully consider the required conditions to ensure appropriate static charge removal before installation.
  When mounting the product, use M3 hexagon socket head bolts. Tightening torque is 0.61 to 0.63 N•m.

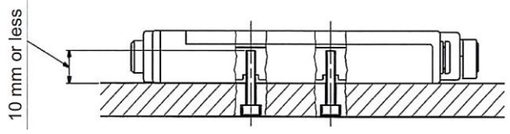
3 Installation (continued)

3.2 Mounting

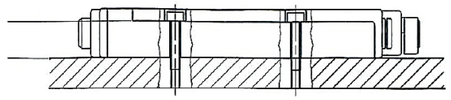
(1) Body mounting: Tapped or Through holes

Refer to the figure below, affix the product using hexagon socket head screws (prepared by the user) with optimum length.
M3 screw recommended tightening torque is 0.61 to 0.63 N•m.

Tapped holes
Use screws with a maximum screw in depth of 10 mm.

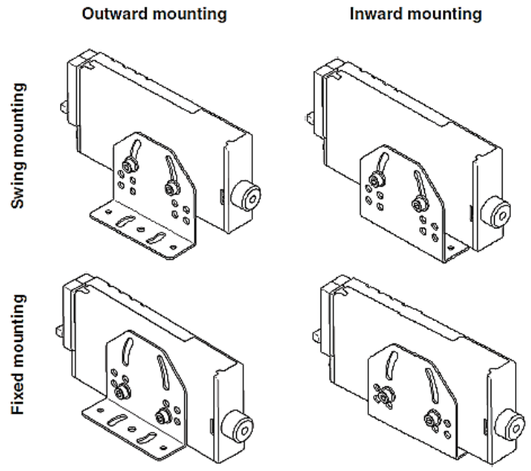


Through holes
Use screws with a minimum length of 12 mm



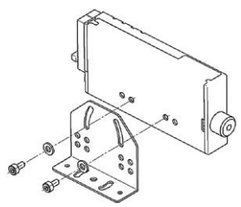
(2) L-shaped bracket

The L-shaped bracket can be mounted in 4 different ways as shown below.

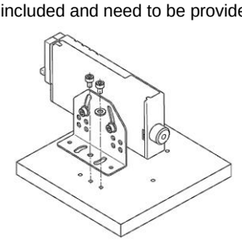


(3) Outward mounting of bracket

1) Use hexagon socket head screws (M3 x 6) and washers supplied attached to the product and mount the L-bracket.

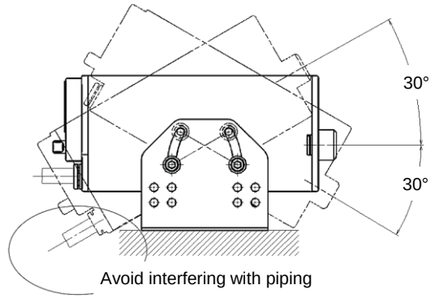


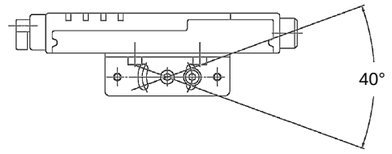
2) Adjust the angle of the ionizer body to ensure proper static charge removal and fix it in position with the bracket locking screws. For the slotted hole, use the washers attached to the product. Hexagon socket head screws are not included and need to be provided separately.



3 Installation (continued)

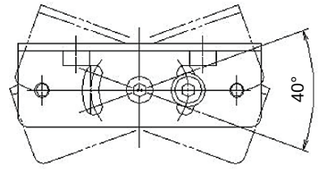
3) The mounting angle of the product can be adjusted within the following range.



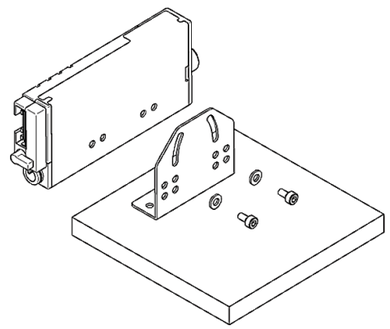


(4) Inward mounting of bracket

1) Before mounting the product, mount the L-shaped bracket where the product will be installed. The mounting angle of the bracket can be adjusted in the following range. Hexagon socket head bolts are not included with the product and need to be provided separately.

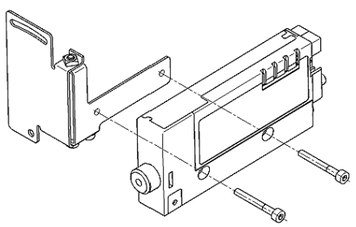


2) Affix the product with the hexagon socket head bolts (M3 X 6) and washers supplied attached to the product. Tightening torque is 0.61 to 0.63 N•m.



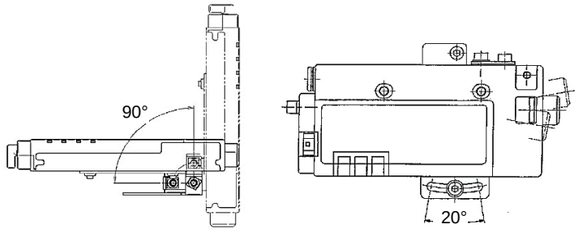
(4) Pivoting bracket

1) Mount the pivoting bracket to the product with the hexagon socket head screws and washers supplied attached to the product. Tightening torque is 0.61 to 0.63 N•m.



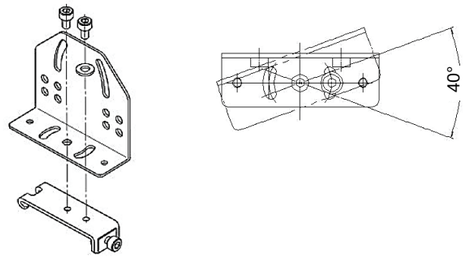
3 Installation (continued)

2) Adjust the product to the desired mounting angle and secure in position.

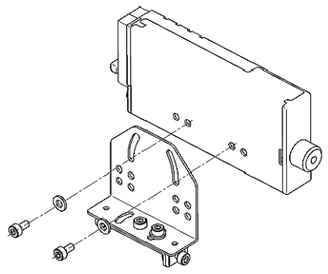


(6) DIN rail mounting bracket

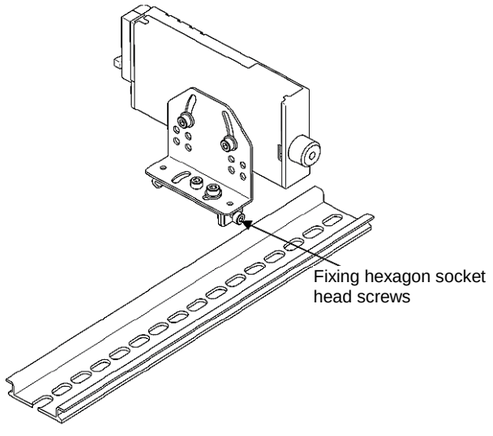
1) Adjust the L-shaped bracket to the desired angle and fix in position on the DIN rail bracket.



2) Mount the L-shaped bracket to the product with the hexagon socket head screws (M3 x 6) and washers supplied attached to the product.



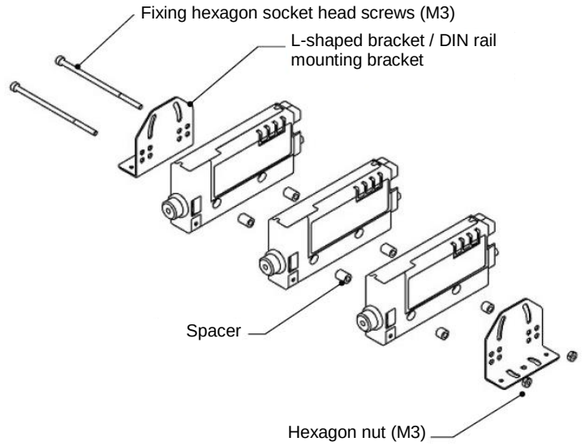
3) Mount the product to the DIN rail and tighten the socket head screws to secure.



3 Installation (continued)

(7) Mounting of multiple ionizers

1) Insert the spacers between the counter bores of the body.
2) Hold the product by the L-shaped brackets from both ends and tighten the hexagon socket head screws. Tightening torque is 0.61 to 0.63 N•m.
The composition of parts to connect 3 ionizers is shown below.



3.3 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 mount in a location exposed to radiant heat.**
- **Use within operating fluid and ambient temperature.**
  The operating fluid and ambient temperature range for the ionizer is 0 to 55°C. In areas where sudden temperature changes occur, even when these changes are within the specified temperature range, condensation may form. The ionizer should not be used in such conditions.
- **Do not use this product in an enclosed space.**
  This product utilizes the corona discharge method of operation and as this process generates small amounts of ozone and NOx, the ionizer must only be used in open, well-ventilated areas.
- **Environments to avoid**

Do not use or store under the following conditions, as these may cause equipment failure:

1. Ambient temperatures outside the range 0 to 55°C.
2. Ambient humidity outside the range 35 to 65 % RH.
3. Areas where rapid temperature changes may cause condensation.
4. Areas where corrosive gas, flammable gas or other volatile flammable substances are stored.
5. Areas where the product may be exposed to conductive powder such as iron powder or dust, oil mist, salt, organic solvent, machining chips, particles or cutting oil.
6. Directly in the path of air conditioners.
7. In enclosed, poorly ventilated areas.
8. Exposed to direct sunlight and/or radiant heat.
9. Areas where strong electromagnetic noise is generated, such as strong electrical and magnetic fields or supply voltage spikes.
10. Areas where the product may be subject to electro-static discharge.
11. Areas where RF noise is generated.
12. Areas prone to lightning strikes.
13. Areas where the product may receive direct impact or vibration.
14. Areas where the product may be subject to forces or weight that could cause physical deformation.

If these conditions are unavoidable, take appropriate protection measures.

- **Do not use air containing mist or dust.**
  Air containing mist or dust may lower function and shorten the maintenance cycle. Use a dryer (IDF series), air filter (AF/AFF series), and mist separator (AFM/AM series) to produce clean compressed air.
- **The ionizer is not immune to lightning strikes.**
  Protection against electrical surges due to lightning should be incorporated into the equipment.

3 Installation (continued)

3.4 Piping

⚠ Caution

- Before 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 1.5 to 2 threads exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

4 Wiring

4.1 Wiring

⚠ Warning

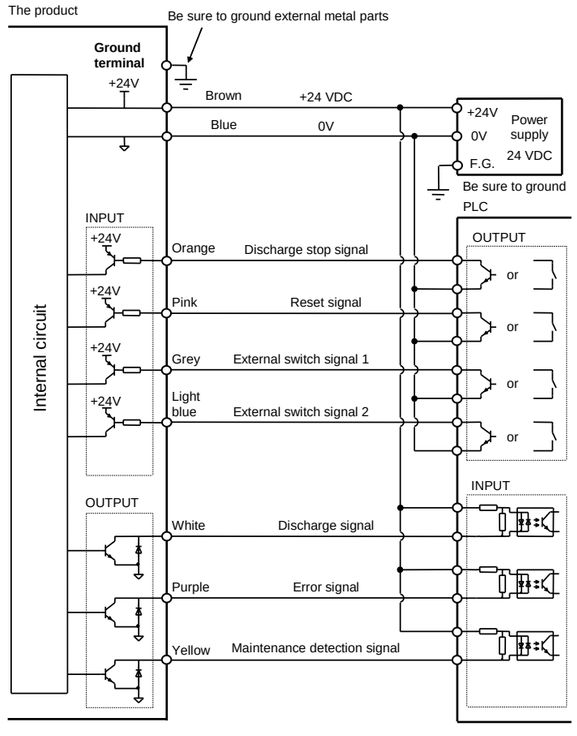
- **Before wiring, ensure that the power supply capacity meets the specification and that the voltage is within the specification.**
- **Always use a UL listed / recognized power supply, which must be a class 2 power supply of 24 VDC and limited to 2.1 A.**
- **To maintain product performance and to prevent electrical shock connect a protective earth in accordance with instructions in this manual.**
- **Ensure power supply is completely disconnected when wiring, this includes plugging in or removing connectors as the product may be damaged.**
- **Check wiring is correct and confirm safety, before powering up the product. Incorrect wiring may cause product damage or malfunction.**
- **Do not route product wires and cables together with power or high-voltage cables to prevent malfunction due to noise.**

4.1.1 Connection Circuit

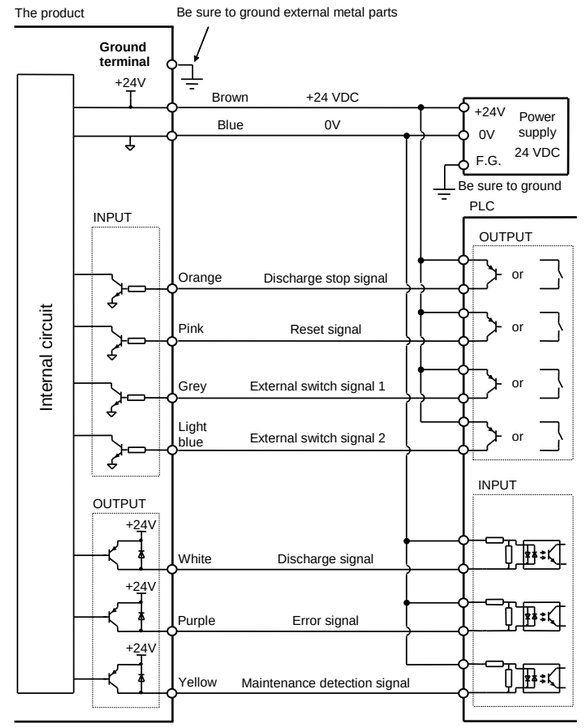
Wire power cables according to the connection circuit and wiring diagram.
The ground connection is used as a reference electric potential for static neutralization. If the product is not grounded correctly, the Ionizer will not be able to achieve the optimal offset voltage (ion balance).

Connection circuit

NPN Input / Output



PNP Input / Output



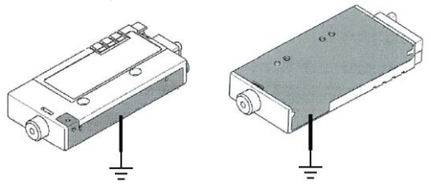
Wiring table

Pin No.	Cable colour	Signal name	I/O	Connection	Description
1	Brown	+24 VDC	-	O	Power supply +
2	Blue	0 VDC	-	O	Power supply -
3	Orange	Discharge stop signal	IN	O	When the signal is OFF, the discharge stops.
4	Pink	Reset signal	IN		When the signal is turned ON and then OFF, the error signal is reset. When the signal is turned OFF: normal operation continues.
5	White	Discharge signal	OUT		The signal stays ON during discharge.
6	Purple	Error signal	OUT		The signal is turned OFF when an error occurs.
7	Yellow	Maintenance detection signal	OUT		The signal is turned ON when maintenance is due.
8	Grey	External switch signal 1	IN		When the signal is turned ON, the discharge stops.
9	Light blue	External switch signal 2	IN		

O = minimum number of connections required to operate the ionizer.

4.1.2 Ground connection

In addition to the above wiring, ensure the external face of the product (metal shaded part) is connected to protective ground. If grounding is not provided or is insufficient, the specified charge elimination capability is not available and the maintenance signal will turn ON.

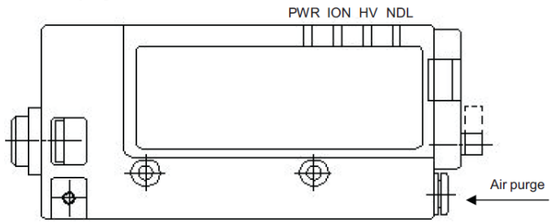


5 Function

1. **Detection of contamination on emitter**
   During operation reduced charge elimination capability due to contamination or wear of the emitter is monitored continuously. If it becomes necessary to clean the emitter, the LED for maintenance lights up on the display of the product and maintenance output signal is generated.

2. **Input of external switch signal**
   There are two ports for external switch signal inputs.
   If a pressure switch or electrostatic sensor is connected, discharge can be stopped for abnormal pressure or completion of charge elimination.

3. **LED display**



Name	LED	Colour	Content
Power supply display	PWR	Green	LED is ON when the power supply is turned ON.
Discharge	ION	Green	LED is ON when discharge is performed.
Irregular high voltage display	HV	Red	LED is ON when excessive current flows through the emitter.
Maintenance detection display	NDL	Orange	LED is ON when contamination or wear of the emitter is detected.

4. **LED state**

Item	PWR	ION	HV	NDL	Remarks
Normal operation (with discharge stop signal ON)	●	●			Ion emission.
Normal operation (with discharge stop signal OFF)	●				Discharge stopped.
Abnormal high voltage detected	●		●		Discharge stopped due to error detected.
External switch signal 1	●				Discharge stopped due to signal input.
External switch signal 2	●				
Maintenance detection activated	●	●		●	Ions emitted continuously even when contamination on the emitter has been detected.

5. **Alarm details**

Description	Content	How to reset
High voltage error	Informs that excessive current (such as high voltage leakage) has occurred at the emitter. “HV” LED will turn ON and ion emission is stopped. The error signal us turned OFF when error occurs.	Turn OFF the power supply, find and solve the error, restart the power supply. If the error has been corrected, turn the reset signal ON and OFF.
Maintenance detection	Informs that maintenance of the emitter is required. “NDL” LED turns ON and maintenance signal is output.	Turn OFF the power supply, clean the emitter, and then restart the power supply.

6 How to Order

Refer to the operation manual or catalogue on the SMC website (URL: https://www.smcworld.com) for “How to Order” information

7 Outline Dimensions (mm)

Refer to the operation manual or catalogue on the SMC website (URL: https://www.smcworld.com) for “Outline dimensions.

8 Maintenance

8.1 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

1. Do not drop, hit an object or cause excessive impact (10 G or more) when handling. Although externally the ionizer may not appear to be broken, there may be internal damage causing malfunction.
2. When the cable is inserted or removed, pinch modular plug spring clip with finger and insert or remove the plug in a straight line. If inserted or removed in an inappropriate direction, the mounting part of the modular jack might be damaged leading to operational failure.

⚠ Caution

1. **Keep emitter clean with regular maintenance.**
   Make sure that the equipment is operating without any errors by regular maintenance. Only people with sufficient knowledge and experience should perform maintenance of the equipment. Contamination adhering to the emitter, due to long operating periods, reduces the ability of the ionizer to eliminate static electricity. If, after cleaning the emitter, the ionizer does not regain its correct performance, the emitter should be replaced. In order to maintain stable performance, regular maintenance and cleaning of the emitter is recommended.

   Caution: High Voltage

   This product contains a high voltage generation circuit. When performing maintenance inspection, be sure to confirm that the power supply to the ionizer is turned off. Never disassemble or modify the product, as this can cause loss of product functionality, and there is also a risk of electric shock and earth leakage.

2. **The tube and fitting must be treated as consumable parts.**
   The tube and fitting connected to the female piping port of the product can deteriorate due to ozone and need to be replaced regularly

3. **The power supply must be removed when cleaning the emitter, or changing the emitter cartridge.**
   To avoid the risk of electric shock, do not touch the emitter whilst the ionizer has power connected.

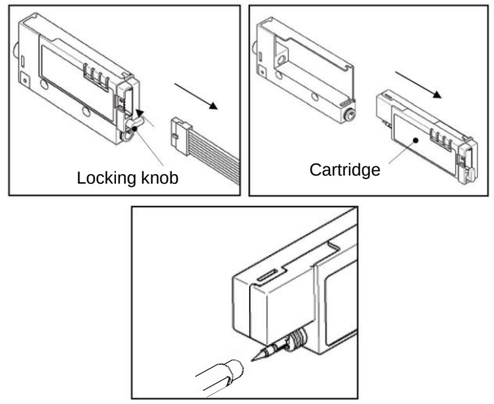
4. **To avoid electric shock, failure, fire etc. do not service or modify the product.**
   Non-SMC serviced or modified products are not guaranteed to meet the published specification.

5. **Do not operate the product with wet hands.**
   There is a danger of electric shock.

8 Maintenance (continued)

8.2 Emitter Maintenance

Cleaning of the emitter.
1. Disconnect the power supply cable.
2. Rotate the locking knob and pull down the cartridge.
3. Clean the emitter.
4. Mount the cartridge and power supply cable in the reverse order to complete the cleaning.



9 Limitations of Use

⚠ Warning

Do not exceed any of the specifications laid out in section 7 of the operation manual or the product catalogue.

10 Product disposal

This product should not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

11 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor / importer.

SMC Corporation

URL : http// www.smcworld.com (Global) http// www.smc.eu (Europe)
SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan

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