



ORIGINAL INSTRUCTIONS

Instruction Manual
Bar type Ionizer
Series IZSW10



The intended use of this product is to neutralize electrostatically 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) ^{*)}, and other safety regulations.

^{*)}ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components.

ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components.

IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements.

ISO 10218-1: Robotics - Safety requirements - Part 1: Industrial 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

- **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.

1.1 Safety instructions

Warning

- **This product is intended for use in general factory automation.** Consult SMC beforehand when using this product for other use.
- **Use within the specified voltage and temperature range.** Operation with a voltage other than that specified can cause malfunction, damage to the product, electric shock or fire.
- **Use clean compressed air (Air quality Class 2.4.3, 2.5.3, 2.6.3 or higher according to ISO 8573-1: 2010 is recommended).** Never use flammable or explosive gas. This may lead to fire or explosion. If fluid other than compressed air is used, consult SMC.
- **The product is not designed to be explosion proof.** Never use in an atmosphere of potential dust explosion, flammable or explosive gas. It may cause fire.

Caution

- **Clean room specification is not available with this product.** This product is not suitable for a clean room environment. When using this product in a clean room environment, flush and confirm the product’s purification level before use. Minute amounts of particles are generated due to wearing of the emitters while the lonizer is operating.
- **Do not apply excessive external force or shock (100 m/s² or more) to the product.** Even if there are no problems with the appearance of the lonizer, damage to the internal components may cause malfunction.
- **Hold the ends of the product so that moment load is not applied.** Handling the product by either end of the product may cause deformation or product damage.

1 Safety Instructions (continued)

- The power cable, emitter cartridge and piping tube must be connected and disconnected by hand. Use of tools, etc. may cause damage. To remove the connector, loosen the lock nut by hand and pull it straight out.
- Remove water and dust before installing and removing the power cable, emitter cartridge, and piping tube.
- If smoke, fire or smells occur in the product, immediately turn off the power supply.
- Before cleaning the equipment, make sure that the power cable and air tube are connected and that the power supply is turned off.
- Do not use metal brushes or tools that may damage or scratch the product.
- Emitter cartridges for air purge (high-flow, middle-flow, and low-flow) will allow water and dust to enter through the nozzle holes if air purge is not used. To prevent infiltration, clean the cartridge with air purge (supply pressure 0.1 to 0.5 MPa). If water is allowed to accumulate in the flow path, it may be blown out onto the workpiece.
- Make sure the surface is dry and not wet before supplying power to the lonizer.

2 Specifications

2.1 Ionizer specifications

Model		IZSW10
Ion generation		Corona discharge method
Applied voltage method (Ion generation mode)		DC, Dual AC
Applied voltage ^{*)1)}		+/- 7,000 V
Offset voltage ^{*)2)}		-30 V to +30V
Air purge	Fluid	Air (Clean and dry)
	Purity class	ISO8573-1:2010 [2:4:3] [2:5:3] [2:6:3]
	Max. operating pressure	0.5 MPa
	Proof pressure	0.7 MPa
Piping port		Thread G1/8 (standard fitting: Tube O.D. Ø6 mm、Ø8 mm)
Power supply voltage		24 VDC +/-10%
Current consumption		700 mA max.
Input signal	NPN	Voltage range: 5 VDC or less, Current consumption: 5 mA or less
	PNP	Voltage range: 19 VDC to supply voltage, Current consumption: 5 mA or less
Output signal	NPN	Max. load current: 100 mA or less Residual voltage: 1 V or less (at 100 mA) Max. supply voltage: 26.4 VDC
	PNP	Max. load current: 100 mA or less Residual voltage: 1V or less (at 100 mA)
Functions		Auto balance, Averaging function, Maintenance detection, High voltage abnormality detection (Ion generation stops when abnormality detected), Ion generation stop input, Alarm output signal check
Materials		Bar: ABS, PBT, PC, PET, FKM, SUS, Tungsten Power supply cable: PVC, Elastomer, SUS Bracket: SUS
Ambient and fluid temperature		0 to +50°C
Ambient humidity		35 to 80% RH (no condensation)
Protection Rating	Airless cartridge	IP66
	High flow cartridge	With air purge: IP66 ^{*)3)} Without air purge: IP50
	Middle flow cartridge	
	Low flow cartridge	
Standards / Directives		CE (EMC and RoHS directive), UKCA

^{*)1)} Measured value with a high voltage probe (1000 MΩ, 5 pF).

^{*)2)} Ion generation Dual-AC mode with air purge at 300 mm between the workpiece and lonizer.

^{*)3)} When air purge is used with supply pressure of 0.1 MPa to 0.5 MPa.

3 Installation

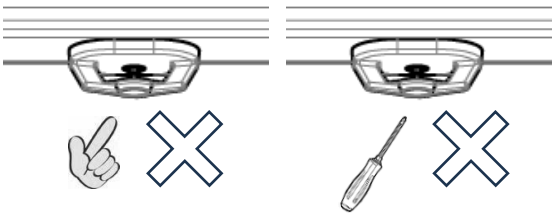
3.1 Installation

Warning

- **Do not install the product unless the safety instructions have been read and understood.**
- Reserve sufficient space for maintenance and wiring. Take into consideration that space is required for the connectors to be easily attached / detached. To avoid unreasonable stress applied to the connector mounting parts, bending of the cable should be more than the minimum bending radius. If the cable is bent in an acute angle or repeated load is applied to the cable, it may cause malfunction, wire damage or fire. Power supply cable (IZSW10-CP#) minimum bending radius: 50 mm. Note: This is an allowable bend radius at 20°C. The bend radius should be larger at lower than 20°C.
- Mount to a flat surface and do not apply impact load or excessive external force. Mounting on an uneven surface will apply excessive force to the housing and bracket, which may lead to damage or product failure. Do not drop or apply excessive shock. Otherwise, damage or an accident may occur.
- Avoid installing in a place where noise (electromagnetic wave and surge) is generated. It may cause malfunction, deterioration or damage to internal components. Take measures to prevent noise at its source and avoid power and signal lines from coming into close contact.
- Tighten screws to the specified torque. If screws are tightened in excess of the specified torque range, it may damage the mounting screws, brackets, etc. If the tightening torque is insufficient, the mounting screws and brackets may become loose.
- Do not directly touch the emitters. If the emitter sticks to your finger, or an electric shock causes an instantaneous rapid body motion to escape from the shock, you may touch equipment around you, causing injury. If the emitter or cartridge is damaged by tools, etc., it may interfere with the specified function and performance and may also cause operation failure or an accident.

Caution: High Voltage

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

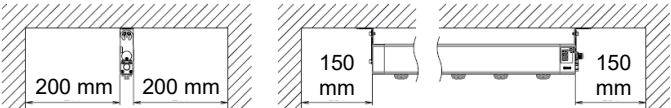


- Do not affix tape or labels to the product. If the tape or label contains conductive adhesive or reflective paint, it is possible that due to the dielectric effect, charge could build up causing an electro-static discharge or electrical leakage, resulting in electrostatic charging or electric leakage, causing malfunction, damage, electric shock or fire.
- Be sure to remove the power supply and air supply to the lonizer before commencing product installation. If installation or adjustment is performed with power supplied, electric shock, failure or injury can result.
- Do not damage the cable or apply a heavy object. Avoid repeatedly bending or stretching the cable. It may cause an electric shock, fire, or wire damage.
- Do not carry the product by holding the cables. It may cause an injury or damage to the product.
- This product may cause interference if used in residential premises.

3 Installation (continued)

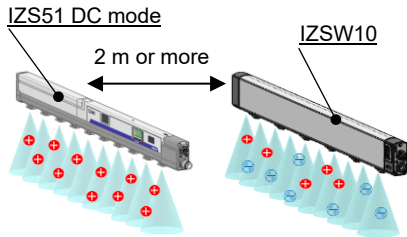
Caution

- Install the ionizer while maintaining a distance from any wall, etc. as shown in the figure below.



When there is a wall or an object within the area shown in the figure, generated ions may not reach the workpiece effectively, resulting in deterioration of efficiency, product failure or electric shock can result due to dielectric or short-circuit.

- Verify the performance of the product after installation. The effect of the lonizer varies depending on the surrounding installation and operating conditions. Confirm the effect of static electricity elimination after installation.
- When installing lonizers which operate in DC mode (one polarity, positive or negative) with IZSW10 close together, they should be positioned at least 2 m apart from each other. The offset voltage (ion balance) may not be adjusted by the built-in sensor due to ions discharged from an lonizer which is operating in DC mode.



- When the auto balance sensor is ON and the offset voltage value cannot be adjusted to zero by pressing the button, turn the sensor off. The sensor may malfunction if there is an object with too much charge around it.

- Use only the specified brackets for mounting.

3.2 Environment

Warning

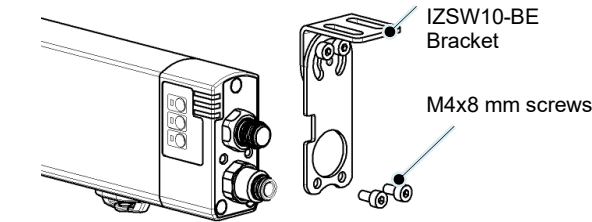
- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product specifications.
- Do not use the product in locations where the temperature may change suddenly even if the ambient temperature range is within the specified limits, resulting in condensation. Large differences between the ambient temperature and the fluid temperature may cause condensation inside the piping or the lonizer housing. If the temperature difference is large, use a temperature controller or similar device.
- Do not use the product in an enclosed space. The ionizer utilizes the corona discharge phenomenon. Do not use the product in an enclosed space as ozone and nitrogen oxides exist, even though in marginal quantities.
- Environments to avoid Never use or store the product under the following conditions. These may cause an electric shock, fire, etc.
 - a. Environment with an ambient temperature outside of the product specifications.
 - b. Environment which ambient humidity is outside of the product specifications.
 - c. Environments where abrupt temperature changes may cause condensation.
 - d. Environments where corrosive gas, flammable gas or other volatile flammable substances are stored.

3 Installation (continued)

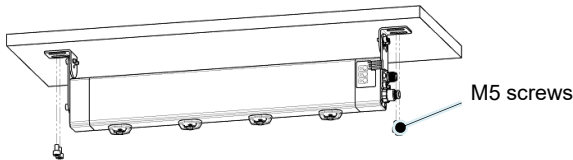
- e. Environments where the product may be exposed to conductive dust or liquids other than water.
- f. Paths of direct air flow, such as air conditioners.
- g. Enclosed or poorly ventilated environments.
- h. Locations which are exposed to direct sunlight or heat radiation.
- i. Areas where strong electromagnetic noise is generated, such as strong electrical and magnetic fields or supply voltage spikes.
- j. Environment where static electricity is generated.
- k. Locations where strong high frequency is generated.
- l. Locations which are subject to potential lightning strikes.
- m. In an area where the product may receive direct impact or vibration.
- n. Areas where the product may be subjected to forces or weight that could cause physical deformation.

3.3 Mounting and installation

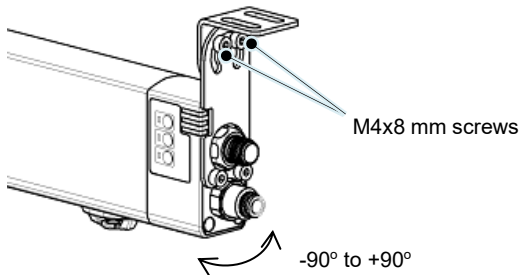
- Mount a bracket to both ends of the ionizer bar using M4x8 mm screws and apply the specified tightening torque.
Tightening torque: 0.51 to 0.55 N.m.



- Fix the bracket in the required position using M5 screws.



- Adjust the mounting angle of the product for effective neutralization and fix the product with the rotating set screws.
Tightening torque: 0.72 to 0.76 N.m.



4 Wiring

4.1 Wiring



- Before wiring, ensure that the power supply capacity meets the specification and that the voltage is within the specification. Product damage or malfunction can result.
- To maintain product performance, the power supply should be UL Class 2 certified by National Electric Code (NEC) or evaluated as a limited power source according to UL60950.
- To maintain the product performance, ground the product with an earth ground cable with a resistance of 100 Ω or less. If the product is not grounded, it is not possible to secure the performance and may lead to product failure or malfunction.
- Wiring (including insertion and removal of the power supply connector) should never be carried out with the power supply ON. Otherwise, an electrical shock or accident may occur.
- Use only the specified cable for connecting the product. Do not disassemble or modify it. Disassembling or modifying the product may cause product failure, electric shock or fire. The product will not be guaranteed if it is disassembled and/or modified.

4 Wiring (continued)

- Ensure the safety of wiring and surrounding conditions before supplying power.
- Do not connect or disconnect the connectors (including power source) while the power is ON. Failure to follow this procedure may cause product malfunction.
- If power and high voltage cables are routed together, the product may malfunction due to noise. Route the ionizer wires separately.
- Confirm that the wiring is correct before operation. Incorrect wiring will lead to product damage or malfunction.

4.2 Ground the F.G. cable

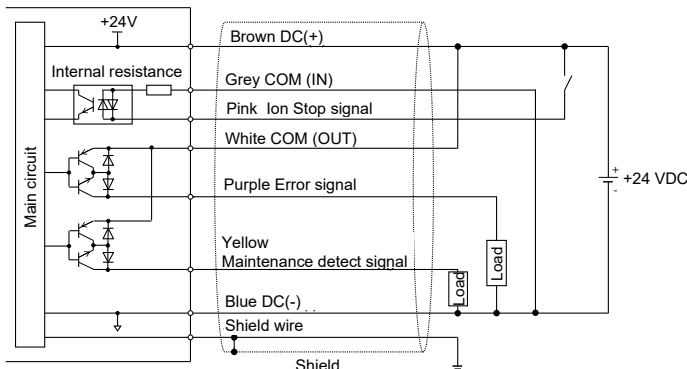
- Make sure to ground the F.G. cable with a ground resistance of 100 Ω or less. The F.G. cable is used as a reference electric potential for static neutralization (Functional Earth).
If the F.G. cable is not grounded, an optimal ion balance cannot be achieved, and it may damage the product or power supply.

4.3 Wiring diagram

- Wire according to the wiring table shown below.
- Unused wires should be cut short or insulated using insulation tape.
- Do not apply excess stress to the mounting part of the connector.
- When the power supply cable is bent, the bend should be larger than the minimum bend radius.
[Minimum bend radius] Power supply cable (IZSW10-CP#): 50 mm

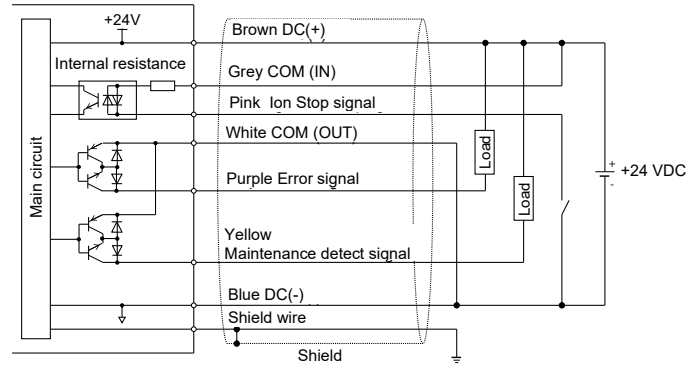
No.	Cable colour	Signal	Signal direction	Description
1	Brown	DC(+)	-	Connect the power supply (+) to operate the Ionizer.
2	Pink	Ion generation stop signal	IN	Signal input to stop ion generation. NPN type: Ion generation is stopped by connecting to 0 V. PNP type: Ion generation is stopped by connecting to +24 VDC.
3	Blue	DC(-)	-	Connect the power supply (-) to operate the Ionizer.
4	Grey	COM (IN)	-	Common terminal for input signals. NPN type: +24 VDC (+ common) PNP type: 0 V (- common)
5	Purple	Error signal	OUT1 (B contact)	Turns OFF in case of power supply failure, high voltage failure, CPU failure or output signal over current.
6	Yellow	Maintenance detection signal	OUT2 (A contact)	Turns ON when the emitter needs cleaning.
7	White	COM (OUT)	-	Common terminal for output signals. NPN type: 0 V (- common) PNP type: +24 VDC (+ common)
8	Shield	F.G.	-	Ground terminal (F.G.)

NPN



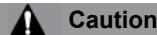
4 Wiring (continued)

PNP



5 Piping

5.1 Piping



- Before connecting piping make sure to clean up chips, cutting oil, dust etc.
- When using an airless cartridge, do not connect any tubing; plug the opening to prevent water or other substances from entering.
- When replacing fittings, tighten them to the specified torque.

6 Settings

- The following settings should be carried out before using the Ionizer. Refer to the operation manual available on the SMC website (<https://www.smcworld.com>).
 - Ion generation mode setting
 - Frequency setting
 - Offset voltage adjustment
 - Auto balance control setting

- Ion generation stop setting
- Output signal checking
- Key lock setting

7 How to Order

Refer to the operation manual or catalogue for 'How to Order'.

8 Outline Dimensions

Refer to drawings or catalogue for outline dimensions.

9 Maintenance



- 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.

9 Maintenance (continued)

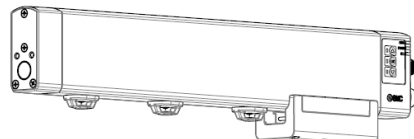
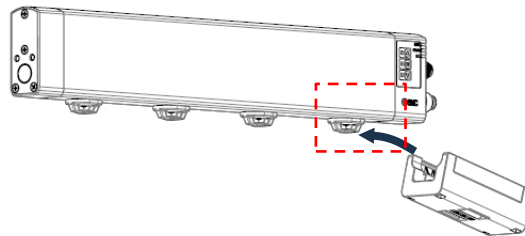
- Do not touch the end of the emitters. They have a sharp end and touching them directly with your fingers may cause injury.
- Only people who have sufficient knowledge are allowed to clean the emitters.
- If the contamination such as dust will stick to the emitters, reducing the static neutralization performance.
- The maintenance detection function is available. When the emitter contamination is detected, clean the emitter.
- In cases where the maintenance detection function is not used, perform neutralizing performance test and set a maintenance cycle for periodic cleaning.
- Emitter contamination level is different depending on the installation environment and supply pressure.
- If the maintenance signal is output upon completion of cleaning the emitter, it may not have been cleaned sufficiently or it may be worn or damaged. If the emitters are worn out or damaged, replace the emitter cartridge. If the emitter is worn out or damaged, the static electricity elimination performance will decrease.

9.1 Cleaning procedure of emitter

It is highly recommended that the emitter cleaning kit (IZSW10-M3 or IZT43-M2) is used to clean the emitter needles.

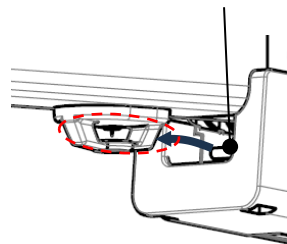
9.1.1 Cleaning procedure using IZSW10-M3

- Before cleaning the emitters, turn OFF the power supply and the air supply.
- Place the cleaning kit (IZSW10-M3) on the Ionizer so that the brush touches the emitter and move it along the bar to clean it.



Slide along the Ionizer body

Brush



Place the cleaning kit so that the brush fits into the circled area shown in the above figure.

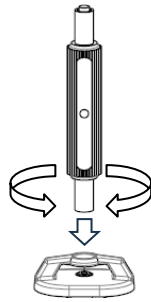
9.1.2 Cleaning procedure using IZT43-M2

- Before cleaning the emitters, stop the power supply and the air supply.
- The emitter cleaning kit (IZT43-M2) has felt at one end of the tool and rubber-bonded whetstone at the other end of the tool.

- Saturate the felt end of the emitter cleaning tool with alcohol and insert it into the back of the emitter cartridge. Turn the tool for several rotations to thoroughly remove dirt.

9 Maintenance (continued)

- If it is not possible to thoroughly remove the dirt using the felt end of the cleaning tool, the rubber-bonded whetstone should be used in the same procedure as described for that of the felt end.
- The alcohol used should be reagent ethanol class 1 99.5 vol% or more.

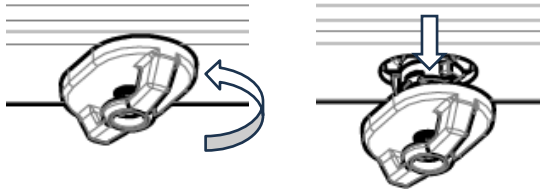


9.2 Emitter cartridge removal and installation procedures

- Emitter cartridges must be removed and installed by hand. Use of tools or other tools may damage the cartridge.

9.2.1 How to remove the emitter cartridge

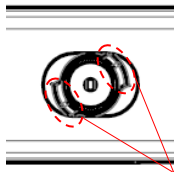
- Turn OFF the power supply and the air supply.
- Refer to the figure to remove the emitter cartridge.



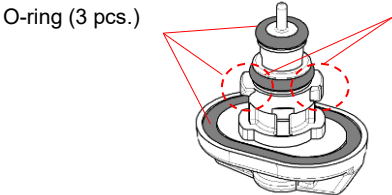
- (1) Rotate the cartridge 60° in the counterclockwise direction.
- (2) Pull to remove.

9.2.2 How to Installation the emitter cartridge

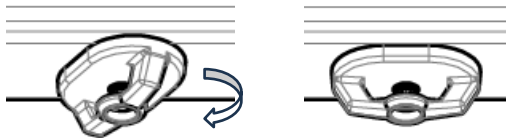
- Check the installation of the O-ring.
- Refer to the figure below to install the emitter cartridge.



Alignment position

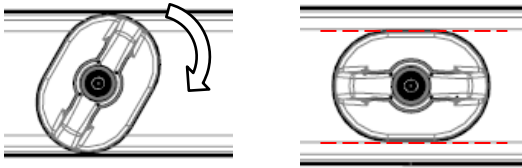


- (1) Insert the emitter cartridge while aligning the protruded part on the cartridge and the mating mark on the lonizer body.

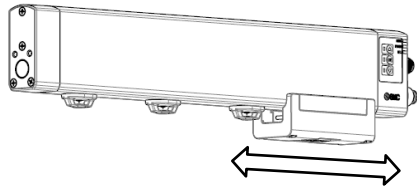


9 Maintenance (continued)

- (2) Rotate the cartridge 60° in the clockwise direction until it is parallel to the groove on the bottom of the lonizer, then secure it in place.



- If the emitter cartridge is not securely attached, there is a risk of ejection or dropout due to compressed air.
- The cleaning kit IZSW10-M3 can be used to check for problems with the mounting position of the cartridge. If the cleaning kit does not advance against the cartridge when it is moved along the bar as it is during cleaning, the installation is insufficient.



Slide along the lonizer body

10 Limitations of Use

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

11 Product Disposal

- This product shall 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.

12 Contacts

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

SMC Corporation

URL : [https:// www.smcworld.com](https://www.smcworld.com) (Global) <https:// www.smc.eu> (Europe)
SMC Corporation, 1-5-5, Kyobashi, Chuo-ku, Tokyo 104-0031, JAPAN
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