

## Instruction Manual Ionizer - Fan type IZF10 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)<sup>1)</sup>, and other safety regulations.

<sup>1)</sup> 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.

	<b>Caution</b>	Indicates a hazard with a low level of risk, which if not avoided, could result in minor or moderate injury.
	<b>Warning</b>	Indicates a hazard with a medium level of risk, which if not avoided, could result in death or serious injury.
	<b>Danger</b>	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.
- Use within the specified voltage and temperature limits.  
Voltage outside of the specification may cause malfunction, damage, electric shock and/or fire.
- This product does not have an explosion-proof construction.  
Do not use this product in areas where dust explosion might be triggered or where flammable or explosive gas is present.

### 2 Specifications

#### 2.1 Ionizer Specifications

Model	IZF10	IZF10-L	IZF10-P	IZF10-LP
Air Flow (m <sup>3</sup> /min)	0.66	0.46	0.66	0.46
Ion generation method	Corona discharge			
Applied voltage method	DC			
Discharge output	±5 kV			
Ion balance	Within ±13 V			
Power supply voltage	24 VDC ±10%			
Max. current consumption	220 mA	140 mA	250 mA	170 mA
Switch Output	Type	NPN open collector		PNP open collector
	Load current	80 mA max.		
	Residual voltage	1 V max. (at 80 mA)		
	Max. load voltage	26.4 VDC	-	
Ambient temperature	0 to 50°C (no freezing)			
Storage temperature	-10 to 60°C			
Ambient humidity	35 to 80% RH (no condensation)			
Material	Case: ABS, stainless steel Emitter: Tungsten			
Weight	280 g (360 g with bracket)			

### 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 and wiring. When installing the electrical connector, ensure sufficient room is left for easy insertion and removal of the electrical cable and emitters. Do not install with sharp bends in the cable. Give consideration to the minimum bend radius, ensure the cable entries are straight, and do not apply stress to the electrical connectors. If the connectors or fittings are subject to mechanical stress, malfunctions such as broken wires or fire may occur.
- 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. Refer to the mounting details for the correct tightening torque. If the tightening torque is exceeded the mounting screws and brackets may become loose.

- Do not touch the emitters with fingers or a metal tool. If the emitters are touched with fingers, injury or damage may result or if the emitters are touched with metal tools damage may result. This may interfere with the specified function and performance, but may also cause operational failure or an accident.

- Be sure to install or adjust the product with the power supply turned off.

##### Caution

- Be sure to check the effect of static charge removal after installation.

The effectiveness of static charge removal varies depending on the installation and operating conditions.

#### 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. Check the product specifications.
- Do not mount in a location exposed to radiant heat.
- Use within the ambient temperature range.

The operating fluid and ambient temperature range for the Ionizer is 0 to 50°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.

The product utilizes the corona discharge phenomenon. Since this process generates a small amount of ozone and NOx, only use the ionizer in open, well-ventilated areas.

- Environments to avoid

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

- Ambient temperatures outside the range 0 to 50°C.
- Ambient humidity outside the range 35 to 85% RH.
- Areas where rapid temperature changes may cause condensation.
- Areas where corrosive gas, flammable gas or other volatile flammable substances are stored.
- 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.
- Directly in the path of air conditioners.

### 3 Installation (continued)

- In enclosed, poorly ventilated areas.
- Exposed to the direct sunlight and/or radiant heat.
- Areas where strong electromagnetic noise is generated (strong electric or magnetic fields, large surges).
- Areas where RF noise is generated.
- Areas prone to lightning strikes.
- Areas where the product is directly exposed to vibration and/or impact.
- Subject to weight or mechanical stresses that could cause deformation of the product.
- The Ionizer is not protected against lightning strikes. Protection against electrical surges due to lightning should be incorporated into the equipment.

#### 3.3 Installation and wiring

It is recommended to investigate environments where static electricity is generated and processes and parts where static electricity disturbance occur in advance, and thoroughly confirm the conditions in order to remove static electricity effectively before installation.

The effect of the ionizer varies depending on the surrounding installation conditions and operating conditions.

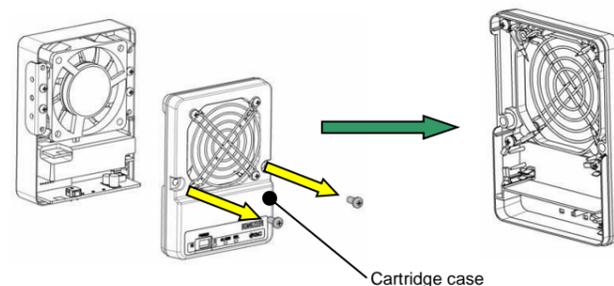
Confirm the effect of static electricity elimination after installation.

#### 3.4 Installation Precautions

Do not connect and disconnect connectors while the power is supplied. The product may be damaged and cause malfunction.

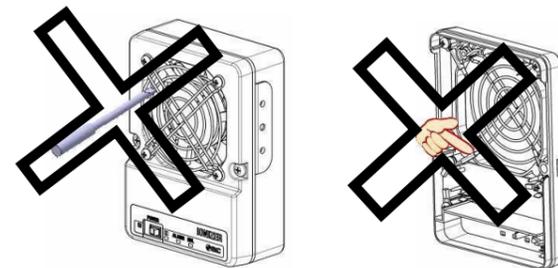
Do not attach tape or sealant on the product body. If the tape or sealant contains conductive adhesive or reflective paint, it is possible that due to the dielectric effect, a charge could build up causing an electro-static discharge or electrical leakage.

When installing the ionizer, ensure the air intake port side of the fan is at least 20mm away from any walls or obstructions. If there is an obstruction of the air intake port, the efficiency will be reduced due to ventilation resistance. Install the ionizer so that the cartridge case can be removed for maintenance and replacement of the emitters. When the emitters are cleaned or replaced, remove the two screws mounted on the cartridge case.



Do not touch the emitters with fingers or a metal tool. It may cause injury or malfunction.

If the emitters are touched with fingers, injury or damage may result, or if the emitters are touched with a metal tool, damage may result. This may interfere with the specified function and performance, but may also cause operational failure or an accident.



##### 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.

### 3 Installation (continued)

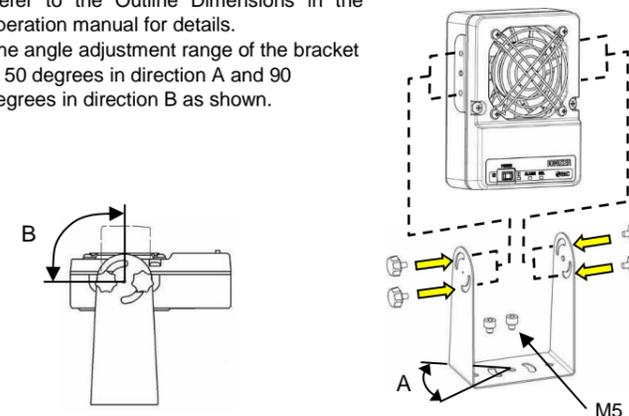
#### 3.5 Mounting

##### 1) Installation with bracket

When installing the ionizer with a bracket, secure it with M5 screws (not supplied) using the holes in the bottom of the bracket.

Refer to the Outline Dimensions in the operation manual for details.

The angle adjustment range of the bracket is 50 degrees in direction A and 90 degrees in direction B as shown.

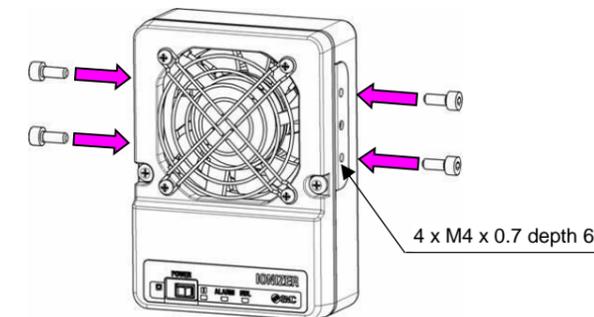


##### 2) Installation without bracket

If a bracket is not used, install the product using the M4 screw holes on the sides of the body (screws are not supplied).

Refer to the Outline Dimensions in the operation manual for details.

M4 screw recommended tightening torque: 1.3 to 1.5 N•m.



### 4 Wiring

#### 4.1 Wiring

##### Warning

- Check the capacity of the power supply is sufficient and the voltage is within the specified range before wiring.
- Always use a UL listed power supply specified by NEC (National Electric Code) with class 2 output or a limited power source in accordance with UL 60950.
- To maintain product performance, and to prevent electrical shock, connect a protective earth in accordance with instructions in this manual. Ensure that the resistance between the lead wire and Ground is less than 100Ω.
- Be sure to turn off the power supply when wiring (including the removal and mounting of the connector).
- When turning on the power supply, check the wiring and ambient conditions for safety.
- Do not remove or mount the connector wired to the power supply with the power supply ON. Otherwise, the product can malfunction.
- Be sure to check for correct wiring before operating the product. Incorrect wiring may lead to damage and malfunction of the product.

#### 4.2 Wiring diagram

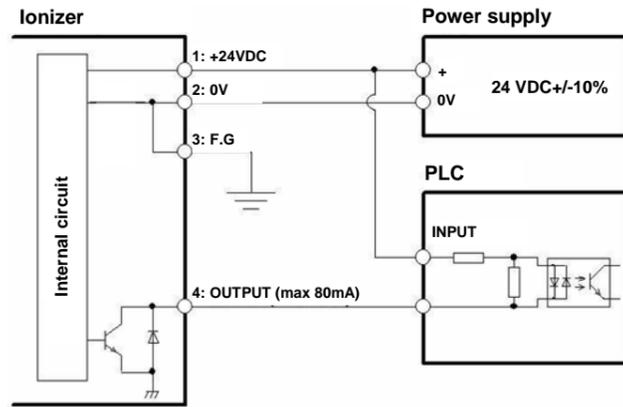
Wire cables according to the circuit and wiring chart.

Be sure to connect the ground terminal (F.G.) with 100 Ω or less resistance to Ground.

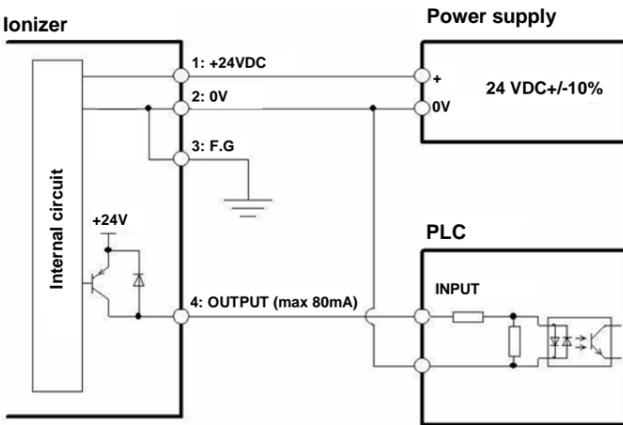
The Ground terminal (F.G.) is used as a reference for the static electricity elimination. If the Ground terminal is not connected, it will not be able to gain an appropriate ion balance.

## 4 Wiring (continued)

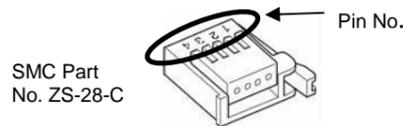
### NPN output



### PNP output



### 4.3 Cable and connector



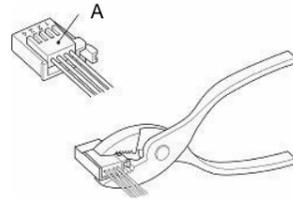
Pin No.	Description	Contents
1	+24 VDC	Ionizer power supply
2	0 V	
3	F.G.	Connect to Ground with 100Ω resistance or less. If this connection is not made correctly, the Ionizer may become damaged. Ground reference point for ionizer operation.
4	Error signal	The output turns OFF when any of the below errors occur (normally ON). - Incorrect function of high voltage circuit for more than 100 ms. - Excess current in the output circuit.

1) The connectors are designed to accept 26 AWG to 24 AWG wire.

AWG No.	Wire size	Outside diameter	Part No.
26-24	0.14 to 0.2 mm <sup>2</sup>	0.8 to 1.0 mm	ZS-28-C

- 2) Insert each lead wire into the connector.
- 3) After verifying that the wires are fully inserted, temporarily press A down by hand.
- 4) Using suitable pliers, press the centre of A straight down.
- 5) Note that the connector cannot be taken apart for re-use once it is crimped. Use a new connector if wiring or cable insertion is incorrect.

## 4 Wiring (continued)



### 4.4 Power supply cable

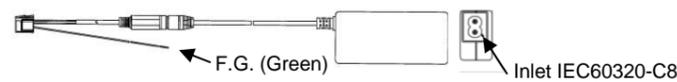
When using the power supply cable, wire it as shown below.

Pin No.	Wire colour	Description
1	Brown	+24 VDC
2	Blue	0 V
3	Green	F.G.
4	Purple	Error signal

Take the minimum bend radius (10 mm) into consideration when fixing the cable in place to prevent mechanical stress from being applied to the connector. *Note) This is the minimum bend radius at 20°C.* Insulate or cut unused wires to prevent possible short circuits.

### 4.5 Wiring of the AC adapter

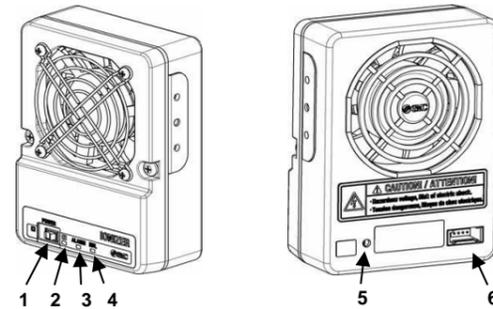
The green wire on the AC power cable must be connected to the ground terminal, F.G. If the ground terminal F.G. is not connected, the ionizer will not be able to achieve the optimal ion balance.



*Note)* The AC cable is not included in IZF10-CG2. Please prepare an AC cable that conforms to the standards for each country. The error signal cannot be used when the AC adapter is used.

## 5 Functions

### 5.1 Summary of product parts



No	Name	Description
1	Power switch	Switch to turn the Ionizer ON and OFF
2	Power indicator	LED is ON (Green) when power is supplied. LED is ON (Orange) during a high voltage error or excess output current.
3	High voltage indicator	LED is ON (Red) for incorrect function of high voltage circuit for more than 100 ms.
4	Maintenance indicator	LED is ON (Green) when the emitter require cleaning.
5	Balance adjustment	Trimmer for fine adjustment of the offset voltage.
6	Connector	Connector for power supply, F.G. and output signal.

### 5.2 Alarm function

If abnormal functioning occurs during operation of the ionizer, the user is alerted by the error signal or LED operation.

- Excess current present on the output circuit  
If excess current is present on the output circuit, the output is turned off to protect the circuit. In this situation, the ionizer operation continues. In order to clear the alarm, reduce the load on the output circuit to 80 mA or less and supply the power again.

## 5 Functions (continued)

- Incorrect high voltage function  
If an abnormal discharge from the emitters continues for more than 100 ms when the ionizer is operated, the ion generation will stop. In this situation, the fan will not stop. An abnormal discharge could be caused by condensation or dust on the emitters. To clear the alarm, remedy the cause of the abnormal discharge and supply the power again.

Alarm	Output	LED	Ion Generation	Fan Rotation	Contents
Rated current for output is exceeded	Error signal OFF when error occurs	POWER (Orange)	ON	ON	Excess current is present on the output circuit and protection circuit is activated. Turn power off then on again.
Abnormal High voltage	Error signal OFF when error occurs	POWER (Orange) ALARM (Red)	OFF	ON	Incorrect function of high voltage circuit for more than 100ms. Turn power off then on again.
Maintenance	-	NDL (Green)	ON	ON	The static electricity elimination performance is reduced due to contamination, wear or damage to the emitters.

## 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



- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- Before performing maintenance, turn off the power supply.
- After installation and maintenance, apply power to the equipment and perform appropriate functional tests to make sure the equipment is installed correctly.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

### 8.2 Specific Recommendations

#### 8.2.1 Fine adjustment of ion balance

The ion balance of the ionizer is adjusted before shipment. However, readjustment might be required depending on the installation environment, so fine adjustment can be performed.

Use the balance trimmer to perform fine adjustment of the ion balance. When performing fine adjustment, use a measuring instrument such as a charged plate monitor.

Rotating the trimmer for fine adjustment clockwise increases the positive ions, and rotating it counter-clockwise increases the negative ions.

#### 8.2.2 Detection and cleaning of emitter contamination

If the ionizer is used for a long time, dust can adhere to the emitters, reducing the static electricity elimination performance.

This product has a function whereby an LED indicates when the emitters are contaminated.

The emitters should be cleaned when contamination is detected, or once a week.

Clean the emitters with the cleaning kit [IZS30-M2] or a cotton bud soaked in alcohol (the cleaning schedule varies depending on the environment where the ionizer is installed. The cleaning cycle is stated here as a guideline only).

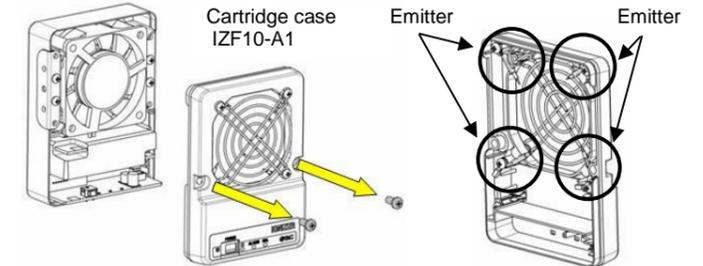
## 8 Maintenance (continued)

Turn off the power supply before cleaning the emitters. Fan rotation may cause injury if power is supplied.

If an emitter is touched while the power is supplied, an electric shock or accident may occur. Also, the point of the emitter is sharp, and touching it may cause an injury.

If the ionizer performance does not recover after cleaning the emitters, it can be assumed that the emitters are damaged or worn out. Then, the emitters or cartridge case should be replaced.

- Mounting / removal and cleaning of cartridge case  
1) Turn off the ionizer power supply.  
2) Remove the 2 screws (as shown in the figure below) and remove the cartridge case.



3) 4 emitters are fixed inside the cartridge case. Clean the ends of the emitters. Using the cleaning kit, saturate the felt with industrial alcohol, insert it into the emitters and rotate several times to clean. If the contamination is not removed, use the rubber grindstone to clean the emitters in the same way.

The cleaning kit has felt and rubber grindstones on the ends. Choose the felt or rubber grindstone depending on the level of contamination to effectively clean the emitters.

4) Replace the cartridge case back in its original position by reversing the removal procedure. Take care not to get the cable caught in the cartridge case when re-mounting. (Recommended tightening torque: 0.7 to 0.8 N·m).

### 8.2.3 Replacement of the cartridge case

If the emitters are worn out or damaged, replace the cartridge case. Remove the screws and replace them as shown in the figure above. (Recommended tightening torque: 0.7 to 0.8 N·m). Take care not to get the cable caught in the enclosure when re-mounting. If replacing the emitters only, then contact SMC.

## 9 Limitations of Use

### 9.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

## 10 Product Disposal

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

## 11 Contacts

Refer to [www.smcworld.com](http://www.smcworld.com) or [www.smc.eu](http://www.smc.eu) for your local distributor/importer.

# SMC Corporation

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