



# Installation and Maintenance Manual

## Fan Type Ionizer

### IZF10 Series



## 1 Safety Instructions

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger", followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

	<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

- The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications. Since the products specified here can be used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet specific requirements.
- **Only trained personnel should operate pneumatically operated machinery and equipment.**  
Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced personnel.
- **Do not service machinery/equipment or attempt to remove components until safety is confirmed.**
  - 1) Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
  - 2) When equipment is to be removed, confirm the safety process as mentioned above. Switch off air and electrical supplies and exhaust all residual compressed air in the system.
  - 3) Before machinery/equipment is re-started, ensure all safety measures to prevent sudden movement of cylinders etc. (Supply air into the system gradually to create back pressure, i.e. incorporate a soft-start valve).
- **Do not use this product outside of the specifications. Contact SMC if it is to be used in any of the following conditions:**
  - 1) Conditions and environments beyond the given specifications, or if the product is to be used outdoors.
  - 2) Installations in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, press applications, or safety equipment.
  - 3) An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

## 1 Safety Instructions (continued)

### 1.1 Specific Recommendations

#### Warning

- **This product is intended for use in general factory automation systems.**  
If other applications (especially those indicated in section 3 above) are used, please contact SMC before use.
- **Use within the specified voltage and temperature limits.**  
Voltage out of 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. It may cause explosion and/or fire.

#### Caution

- **This product has not been flushed.**

### 1.2 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 electrical cable and electrode needles. Do not install with sharp bends in the cable. With consideration of the minimum bend radii given below, ensure that 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 following table for the correct tightening torque. If the tightening torque is exceeded the mounting screws and brackets may become loose.
- Do not touch the electrodes with fingers or a metal tool.  
If the electrodes are touched with fingers, injury or damage may result or if the electrodes 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.

### 1.3 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.

## 1 Safety Instructions (continued)

- 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.

### 1.4 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. 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.

This 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.
- 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.

## 2 Installation

### 2.1 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.

### 2.2 Installation

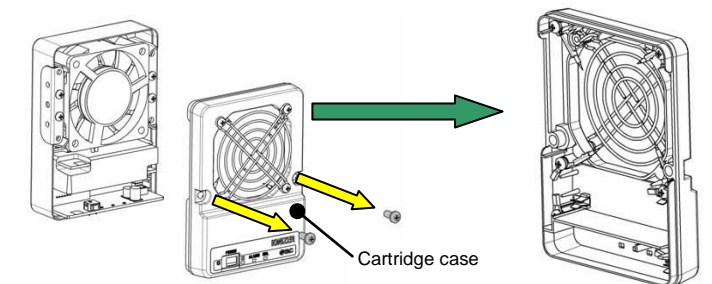
#### 2.2.1 Precautions for installation

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.

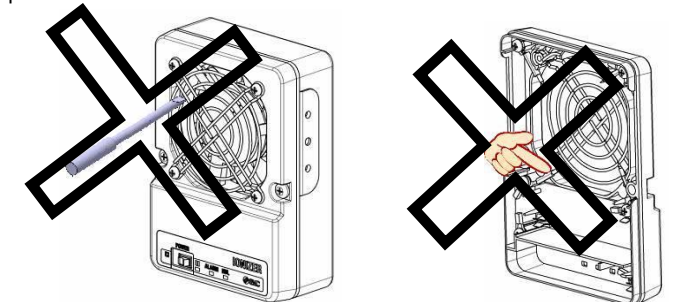
When installing the ionizer, ensure the air intake port side of the fan is at least 20mm away from any walls or obstructions. If there is an obstruction of the air intake port, the efficiency will be reduced due to ventilation resistance.

Install the ionizer so that the cartridge case can be removed for maintenance and replacement of the electrodes. When the electrodes are cleaned or replaced, remove the two screws mounted on the cartridge case.



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

If the electrodes are touched with fingers, injury or damage may result, or if the electrodes 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.

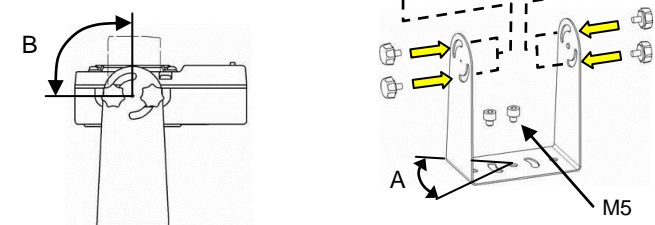


#### 2.2.2 Mounting

##### 1) Installation with bracket

When installing the ionizer with a bracket, secure it with M5 screws (not supplied) using the holes on the bottom of the bracket. Refer to the Outline Dimensions section for details.

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



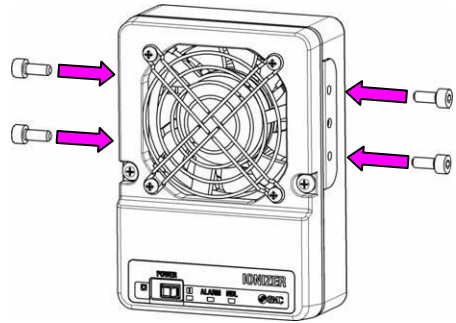
## 2 Installation (continued)

### 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 section for details.

M4 screw recommended tightening torque: 1.3 to 1.5 Nm.



## 3 Wiring

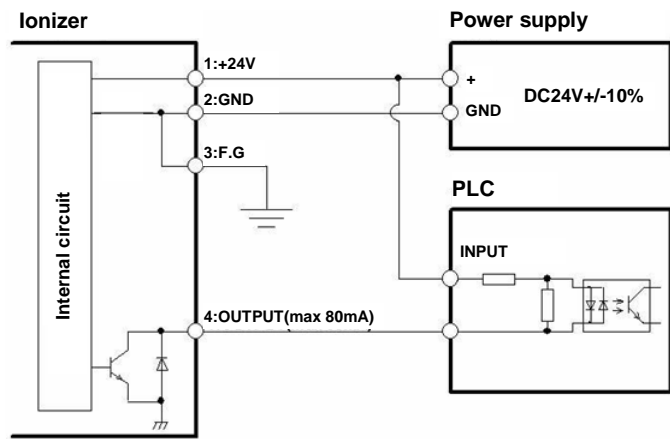
### 3.1 Wiring diagram

Wire cables according to the circuit and wiring chart.

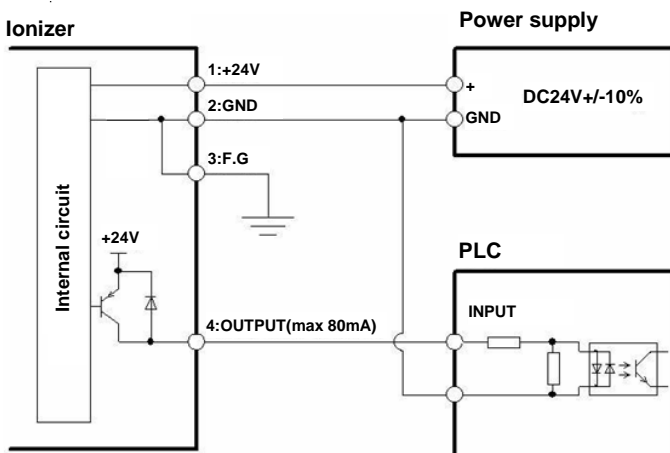
Be sure to connect the ground terminal (F.G.) with 100Ω or less resistance to ground.

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.

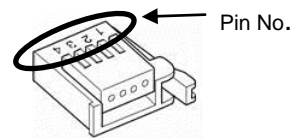
#### NPN output



#### PNP output



## 3 Wiring (continued)



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

### 3.2 Connection cable and connector

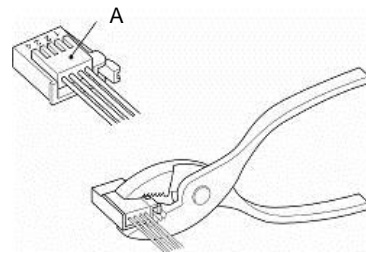
1) The connectors are designed to accept wire between 26 AWG and 24 AWG.

2) Insert each lead wire into the connector.

3) After verifying that the wires are fully inserted, temporarily hold A down by hand.

4) Using pliers, press the center of A straight down.

5) Note that that connector cannot be taken apart for re-use once it is crimped. Use a new connector if wiring or cable insertion is done incorrectly.



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

### 3.3 Wiring of the power supply cable

When using the power supply cable, wire it in accordance with the table below.

Pin No.	Wire colour	Description
1	Brown	DC +24 V
2	Blue	GND
3	Green	F.G.
4	Purple	Output signal

Take the minimum bend radius into consideration when fixing the cable in place to prevent mechanical stress from being applied to the connector.

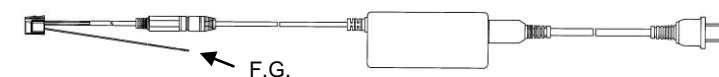
*Minimum bend radius: 10mm*

Note) This is the minimum bend radius at 20°C.

Insulate or cut unused wires to prevent possible short circuits.

### 3.4 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.

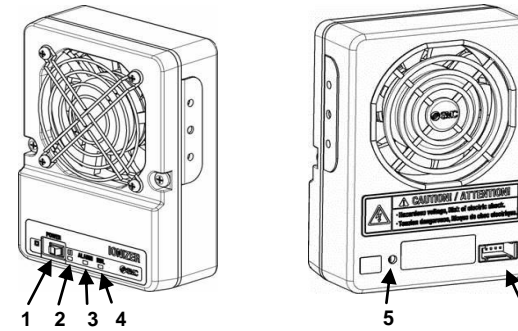


## 4 Timing chart

Refer to the operation manual for this product for further details of the Timing chart.

Ensure the power supply is turned off before clearing errors or cleaning the electrodes.

If an alarm continues to be generated even after cleaning, the electrodes may be damaged. If the electrodes are damaged, they should be replaced.



## 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 electrodes require cleaning.
5	Ion balance trimmer	Trimmer for fine adjustment of the Ion balance.
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 external output 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.

#### • Incorrect high voltage function

If an abnormal discharge from the electrodes 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 electrodes. In order to clear the alarm, remedy the cause of the abnormal discharge and supply the power again.

#### • Maintenance

If the electrodes become contaminated, worn out or damaged, the LED will turn ON.

If the electrodes are contaminated, they can be cleaned, but if they are worn out or damaged, the cartridge case will need to be replaced.

The ionizer will continue to operate during the alarm.

Alarm	Output	LED	Ion Generation	Fan Rotation	Contents
Rated current for output is exceeded	Output 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	Output 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 electrodes.

## 6 Specifications

Refer to the operation manual for this product.

## 7 How to Order

Refer to the operation manual for this product.

## 8 Outline Dimensions (mm)

Refer to the operation manual for this product.

## 9 Maintenance

### 9.1 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.

### 9.2 Specific Recommendations

**9.2.1 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 counterclockwise increases the negative ions.

### 9.2.2 Detection and cleaning of contamination on the electrodes

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

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

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

Clean the electrodes with the electrode 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).

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

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

If the ionizer performance does not recover after cleaning the electrodes, it can be assumed that the electrodes are damaged or worn out. Then, the electrodes 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 electrodes are fixed inside the cartridge case. Clean the ends of the electrodes. Using the cleaning kit, saturate the felt with industrial alcohol, insert it into the electrodes and rotate several times to clean. If the contamination is not removed, use the rubber grindstone to clean the electrodes in the same way. Then, again use the felt saturated with industrial alcohol to finish the cleaning. If a cleaning kit is not available, saturate a cotton bud with alcohol to clean the electrodes. The industrial alcohol used should be reagent ethanol class 1 99.5vol% or greater.

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 electrodes.

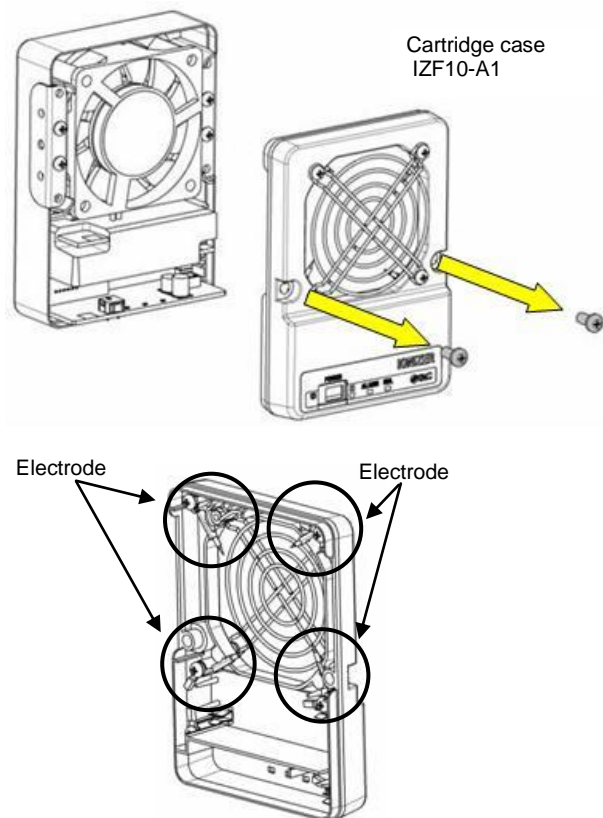
Felt: Use for normal cleaning

Rubber: Use if contamination is hard and stuck to the electrodes and it is not possible to remove it with felt.

## 9 Maintenance (continued)

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 0.8Nm)



### 9.2.3 Replacement of the cartridge case

If the electrodes 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 0.8Nm)

Take care not to get the cable caught in the enclosure when re-mounting.

If replacing the electrodes only, then contact SMC.

## 10 Limitations of Use

### Warning

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

## 11 Disposal Information

This product is classified as Waste Electrical or Electronic Equipment according to the WEEE Directive 2012/19 / EU and should not be disposed of as municipal waste, in order to reduce the impact on human health and the environment.

## 12 Contacts

<b>AUSTRIA</b>	(43) 2262 62280-0	<b>LATVIA</b>	(371) 781 77 00
<b>BELGIUM</b>	(32) 3 355 1464	<b>LITHUANIA</b>	(370) 5 264 8126
<b>BULGARIA</b>	(359) 2 974 4492	<b>NETHERLANDS</b>	(31) 20 531 8888
<b>CZECH REP.</b>	(420) 541 424 611	<b>NORWAY</b>	(47) 67 12 90 20
<b>DENMARK</b>	(45) 7025 2900	<b>POLAND</b>	(48) 22 211 9600
<b>ESTONIA</b>	(372) 651 0370	<b>PORTUGAL</b>	(351) 21 471 1880
<b>FINLAND</b>	(358) 207 513513	<b>ROMANIA</b>	(40) 21 320 5111
<b>FRANCE</b>	(33) 1 6476 1000	<b>SLOVAKIA</b>	(421) 2 444 56725
<b>GERMANY</b>	(49) 6103 4020	<b>SLOVENIA</b>	(386) 73 885 412
<b>GREECE</b>	(30) 210 271 7265	<b>SPAIN</b>	(34) 945 184 100
<b>HUNGARY</b>	(36) 23 511 390	<b>SWEDEN</b>	(46) 8 603 1200
<b>IRELAND</b>	(353) 1 403 9000	<b>SWITZERLAND</b>	(41) 52 396 3131
<b>ITALY</b>	(39) 02 92711	<b>UNITED KINGDOM</b>	(44) 1908 563888

## SMC Corporation

URL : [http:// www.smcworld.com](http://www.smcworld.com) (Global) <http:// www.smceu.com> (Europe)

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