



An ITW Company

IONIZATION SOLUTIONS



Ionizing Bar

IONforce™

User's Manual

About Simco-Ion

Simco-Ion develops, manufactures, and markets system solutions to manage electrostatic charge. As the world's largest provider of electrostatics management products and services, Simco-Ion improves its customers' business results by providing a total solution to their electrostatic discharge and electromagnetic interference challenges. Simco-Ion Technology Group is a division of Illinois Tool Works (ITW), located in Alameda, California. For more information about Simco-Ion visit www.simco-ion.com or call 800-367-2452. Simco-Ion is ISO 9001 and ANSI ESD S20.20 certified.

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Important Safety Information



Carefully read the following safety information before installing or operating the equipment. Failure to follow these safety warnings could result in damage to your ionization system and/or voiding the product warranty.

- ☑ Do not operate the ionization system until all electrical connections and mechanical mountings are complete and secure. The required Controller unit and its electrical power outlet must be properly grounded to ensure proper operation.
- ☑ Do not operate the equipment in an area where flammable chemicals or explosive vapors are present.
- ☑ Do not expose the equipment to excessive moisture (condensation) and do not submerge in any liquid.
- ☑ Do not service or clean the IONforce bar or the Controller unit when electrical power is on. Be sure to turn off the Controller unit and disconnect the line cord from the outlet.
- ☑ Do not connect or disconnect the HV cable connectors when the Controller unit is on. Possible damage to the Controller unit, or personal injury may result.
- ☑ A factory-qualified service technician must perform component service and repairs. Please contact Simco-Ion Customer Service for information.

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1

Description

1.1 IONforce Ionizing Bar

1.2 Features

1.1 IONforce Ionizing Bar

The Simco-Ion' IONforce ion bar provides rapid neutralization of static charges and prevents electrostatic discharge (ESD) in applications such as cleanrooms and workstations. Powered with a Simco-Ion' PFC or VisION Controller unit, the IONforce bar produces positive and negative ions that rapidly neutralize any potentially destructive charges in the work area.



Figure 1. IONforce Ionizing Bar

The IONForce requires minimal maintenance and can provide years of dependable ionization performance. The IONforce ion bar is suitable for clean environments within industry standard ISO Class 10 or higher.

1.2 Features

- The IONforce ion bar operates on the principles of DC corona ionization to produce positive and negative air ions. The bipolar air ions are mobilized by forced air flow from the work area system or through an optional air purge feature built into the bar.
- Electrostatic particle attraction and contamination are greatly reduced or eliminated on surfaces positioned within the range of the bar.
- The compact design of the IONforce bar profile minimizes turbulence in laminar air flow, and allows for simplified mounting on a HEPA/ULPA or T-grid within the work area.
- Careful selection of low-outgasing and RoHS compliant materials along with cleanroom assembly of the IONforce bar ensures minimal source contamination and dependable service.
- The IONforce ion bar is supplied with emitter points of either general purpose Tungsten or ISO Class 1 cleanroom grade Single Crystal Silicon (SCSi).
- Reduction of Hazardous substances per global regulatory requirements.

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Installation

2.1 Location

2.2 Mounting

2.3 Standard Installation

2.1 Location

For optimum performance, the IONforce ion bar should be installed perpendicular to laminar airflow in the equipment. The emitter electrode housings in the bar must not be obstructed or be in direct contact with the equipment frame or filter grid.

2.2 Mounting

The IONforce bar is supplied with special hanging hardware for suspension mounting to a HEPA filter grid or workstation frame.

Each bar is supplied with (2) two or (3) three spring-clamp hangers and a set of push-in adapters with built-in #6-32 stud or nut hardware. The hangers may be used without the adapters to provide clearance holes for installer supplied #8 or #10 screw hardware.

Bars up to 762 mm (30") long require a hanger at each end of the bar.

On longer bars a hanger in the middle of the bar is also necessary.

Note: The installer must determine the best hanger clip and adapter combination for the equipment installation. See Figure 1 for a typical bar hanger arrangement.

Optional mounting brackets are available for common equipment mounting situations.

Contact Simco-Ion Customer Service for additional information.

2.3 Standard Installation

1. Adapter installation into the hanger: Align the narrow base of the Adapter with the retainer tabs in the underside of the Hanger. Push the adapter firmly until it locks into the tabs.
2. Hanger installation onto the bar: Push the open end of the hanger directly over the upper cover of the bar. Carefully stretch one leg of the hanger and release the lip into the groove of the lower cover. Repeat this operation for the other leg of the hanger.
3. A small screwdriver may be levered in the side slot of the hanger to ease this installation. Note: Verify that both lips of the hanger are fully engaged into the grooves of the lower cover only! The hangers may be adjusted along the length of the bar for precise alignment with mounting holes or brackets in the equipment.
4. Install any necessary support brackets for the bar into the equipment. Hold the hanger fasteners up to the equipment mounting holes, and install and tighten any required screws or nuts. Verify that no hardware has contacted the upper cover on the bar.

Caution: Be certain the electrical power is turned off before connecting or disconnecting the HV power cord between the Controller unit and the IONforce bar.

5. Install the HV power cord connector fully into the end cap of the IONforce bar. Secure the connector into the bar with the provided #6 thread forming screw. Ensure that the connector is secure prior to operation.
6. Install the gas tubing into the fitting at the opposite end of the bar (Air assisted bars only): Push the tubing into the fitting until it stops.
7. Route and secure the bar power cord and gas tubing clear of all sharp edges and moving parts within the equipment.

8. Insert the polarized plugs from the HV power cord into the matching polarized connector positions in the Controller unit. Connect the green wire terminal to the grounding stud at the Controller unit. Tighten the nut securely. See Figures 2 and 3.
9. Remove the orange shipping caps from the emitter electrode housings along the bottom of the bar.
10. Verify that the Controller unit power cord is connected to a properly grounded outlet of the correct voltage and phase.
 - Perform the following installation checks:
 - Check that all power cords and gas tubing are properly connected.
 - Ensure that the HV connector into the bar has been secured by the locking screw.
 - Check that the IONforce bar and the Controller unit are securely mounted.
 - Check that no objects are contacting or blocking the bar emitter electrode housings.

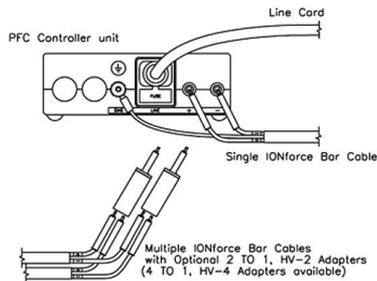


Figure 2. IONforce Bar Connections to PFC Controller Unit

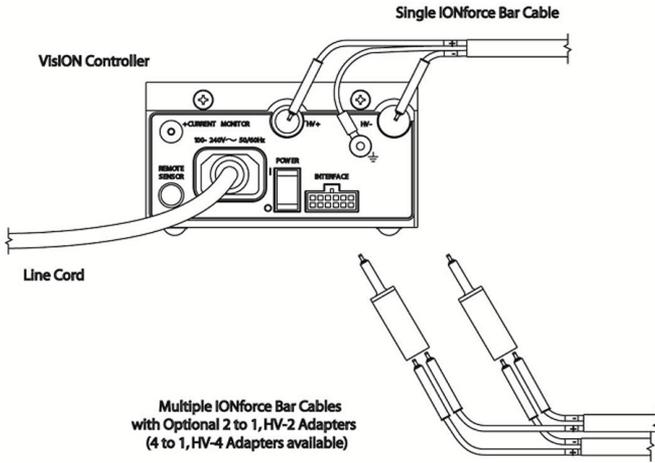


Figure 3. IONforce Bar Connections to VISION Controller Unit

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Operation

Caution: Review the Controller unit operating instructions before applying electrical power to prevent personal injury or damage to the IONforce bar.

1. Turn on the power supply. The IONforce bar immediately begins emitting positive and negative air ions.
2. Connect the gas tubing to the equipment supply (air assisted models only).
3. Adjust the gas pressure to the bar per specifications.
4. Measure the discharge times and the offset voltage from the bar in accordance with standard ESD-STM3.1-2000, Ionization. Adjust the Controller unit as necessary.

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Maintenance

- 4.1 Cleaning & Adjustments
- 4.2 Emitter Cleaning
- 4.3 Emitter & Assembly Replacement

4.1 Cleaning & Adjustments

Periodic maintenance of the IONforce bar is recommended to ensure optimum performance. Harsh environmental conditions such as high temperature, high relative humidity, airborne contaminants, etc., can affect bar performance and physical appearance. Although the following maintenance criteria is suggested, a more frequent schedule may be required if unfavorable environmental conditions exist.

Simco-Ion recommends verifying the ionization system for cleanliness, as well as proper performance on a quarter / yearly basis, or as required for the application. Refer to the Controller unit operating instructions for maintenance details and adjustment schedule.

1. Disconnect electrical power to the Controller unit before performing any maintenance procedure on the IONforce bar.

Note: In some cases it may be necessary to allow the system to discharge for 5 minutes before servicing. This is due to capacitive storage in the HV cabling and bar.

2. Clean the exterior of the IONforce bar, and power cord using a soft, lint-free cloth or swab moistened only with the cleaning agents listed below.
3. Deionized or distilled water (do not use unfiltered or "tap" water). Isopropyl alcohol (do not use butyl alcohol or ether)
4. Verify that the IONforce bar is completely dry and all electrical and mechanical connections are complete and secure before resuming operation.

IONforce Emitter electrodes will have a normal service life of three or more years when provided regular maintenance. Visual inspection of the emitter electrodes is the first step in maintaining reliable performance from the ionizer bar. The tips of the electrodes must remain pointed and free from any deposited material buildup for proper ionizing function.

Dirty electrodes typically have a white coating about the pointed tip and must be cleaned. Severely blunted or broken electrodes must be replaced.



To avoid possible contamination of a cleanroom location, remove the bar from the area before cleaning or replacing emitter electrodes.

Caution:

New emitter electrodes are sharply pointed. Follow all cleaning and replacement instructions to avoid damage to, or injury from the emitter electrode while servicing.

Disconnect power to the IONforce bar before any electrode cleaning or replacement.

4.2 Emitter Cleaning

1. Visually inspect each emitter electrode for signs of deposited material.
2. Simco-Ion recommends using the ITW-TEXWIPE model TX726, CrushTube swab for cleaning the emitter electrodes. A substitute method consists of a cleanroom swab saturated with a solution of de-ionized water and Isopropyl alcohol. These items may be obtained from local cleanroom product suppliers.
3. The TX726 CrushTube swab is shipped with a protective sleeve covering the white foam swab end. Remove the protective sleeve to expose the swab end. Discard the protective sleeve. The CrushTube swab has an inner glass vial of alcohol inside of a plastic tube. Crush the inner glass vial by squeezing the plastic tube, then tilt the foam swab end down to allow the alcohol to wet the swab. Carefully insert the wetted swab onto the emitter point, slowly rotate the tube, and withdraw. Repeat until all deposited material has been removed. Each CrushTube swab may be used to clean from 5 to 8 emitter tips, depending on the amount of material on each tip. When the swab fails to remove the material, a new swab should be used. Clean all the emitter electrode points, wait a few seconds for the alcohol to evaporate, and apply power to the ionizer bar.

4.3 Emitter & Assembly Replacement

1. Either worn and broken emitter electrodes or the complete emitter assembly can be removed from the ionizer bar with special Simco-Ion tools. See "Replacement Parts" list for specific information. See the instructions included with the tool for replacement procedure.
2. Following replacement, Turn the power on to the Controller unit and calibrate the IONforce bar per instructions in the operation manual.
3. A ½ hour "conditioning" period is recommended for an IONforce bar with new electrodes prior to returning to a cleanroom location.

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Specifications

5.1 Specifications

5.2 Dimensions

5.3 Replacement Parts

5.1 Specifications

Input Voltage	±3.5 VDC min, ±8 KVDC max
Input Current	±0.50 (nominal)
Gas Supply	Clean dry air (CDA) or Nitrogen, 170 kPa (25 psi) nominal, 310 kPa (45 psi) max
Emitters	High purity tungsten or Single Crystal Silicon
Operating Env.	Temperature 10-35°C (50-95°F) recommended; relative humidity 20-65%
HV Cable (Standard)	2340 mm (92"), 20 kV-rated with PVC jacket; optional 2340 mm (92"), 20 kV-rated, RoHS compliant
Enclosure	Polycarbonate and Stainless Steel
Weight	0.16 kg per 305mm (0.35 lb per 12")
Warranty	Two year limited warranty

5.3 Replacement Parts

4370760	Tungsten Emitter Point
4371327	Single Crystal Silicon Emitter Point
4108640	Emitter Assembly, Tungsten
4108177	Electrode Extractor Tool
5051419	Kit, Emitter Assembly Removal Tool
5051260	Kit, Electrode with Extractor Tool (Tungsten x7)
5051261	Kit, Electrode with Extractor Tool (Tungsten x11)
5051262	Kit, Electrode with Extractor Tool (Tungsten x15)
5051263	Kit, Electrode with Extractor Tool (Tungsten x19)
5050538	Kit, 2:1 Multi-Connector (HV2 x2)
5050539	Kit, 4:1 Multi-Connector (HV4 x2)
5051409	Kit, Mounting (2 Clip)
5051410	Kit, Mounting (3 Clip)
5051417	Kit, Tubing (3050 mm/ 120")
4108681	Cable Assembly (Standard wire)
4108682	Cable Assembly (RoHS wire)

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Warranty & Service

Simco-Ion provides a limited warranty for the IONforce Ionizing Bar. New products manufactured or sold by Simco-Ion are guaranteed to be free from defects in material or workmanship for a period of two (2) years from date of initial shipment. Simco-Ion liability under its new product warranty is limited to servicing (evaluating, repairing, or replacing) any unit returned to Simco-Ion that has not been subjected to misuse, neglect, lack of routine maintenance, repair, alteration, or accident. In no event shall Simco-Ion be liable for collateral or consequential damages. Consumable items such as, but not exclusive to, emitter points, emitter wires, batteries, filters, fuses or light bulbs are only covered under this warranty if found defective as received with the new product.

To obtain service under this warranty, please contact Simco-Ion Technical Support at techsupport@simco-ion.com or (510) 217-0470.

Notes

Notes



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