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INSTRUCTIONS
Operation/Maintenance

IONforce Ion Bar
(patents pending)

The Simco' 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' PFC or VisION Controller unit, the IONforce bar produces positive and negative ions that rapidly neutralize any potentially destructive charges in the work area.

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.

SECTION 8 Replacement Parts

Part Number	Description
4370760	Electrode, Tungsten
4370971	Electrode, Silicon Carbide
4108640	Emitter Assembly, Tungsten
4108641	Emitter Assembly, Silicon Carbide
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)
5051284	Kit, Electrode with Extractor Tool (Silicon Carbide x7)
5051285	Kit, Electrode with Extractor Tool (Silicon Carbide x11)
5051286	Kit, Electrode with Extractor Tool (Silicon Carbide x15)
5051287	Kit, Electrode with Extractor Tool (Silicon Carbide x19)
5050538	Kit, 2:1 Multi-Connector (HV2 x2)
5050539	Kit, 4:1 Multi-Connector (HV4 x2)
5051409	Kit, Mounting Kit (2 Clip)
5051410	Kit, Mounting Kit (3 Clip)
5051417	Kit, Tubing (3050mm/ 120")
4108681	Cable Assembly (Standard wire)
4108682	Cable Assembly (RoHS wire)

SECTION 9 Warranty

SIMCO warrants its products to be free of defects in components, workmanship, or materials for a period of one year from date of purchase. This warranty does not apply to any physical or electrical damage caused by misuse, abuse or negligence (such as any modifications made to the unit or service work done by any other than SIMCO authorized technicians). Any unit with altered or removed serial number is ineligible for warranty. All products returned must have an "RA" (Return Authorization) number regardless of warranty status. Call SIMCO for an assigned RA number.

SIMCO will not be liable for loss or damage due directly or indirectly to an occurrence or use for which the product is not designed or intended. In no event shall SIMCO be liable for incidental or consequential damages except where state laws override.

This warranty extends to the original purchaser and is not transferable. No person, agent, distributor, dealer or company is authorized to change, modify, or amend the terms of this warranty in any manner whatsoever.
Information in this document is subject to change without notice and does not represent a commitment on the part of SIMCO. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, for any purpose other than the purchaser's personal use without written permission of SIMCO.

SECTION 1 Description

The IONforce ion bar operates on the principles of DC corona ionization to produce positive and negative air ions. The bi-polar 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 Silicon Carbide (CVD SiC).
* Reduction of Hazardous substances per global regulatory requirements.

SECTION 2 Safety

Read the complete Instruction Manual before proceeding with installation or operation. Failure to follow instructions may result in damage to the IONforce ion bar or Controller unit. To avoid personal injury, do not operate any equipment or perform any servicing other than as instructed in this manual.

1. 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.
2. Do not operate the equipment in an area where flammable chemicals or explosive vapors are present.
3. Do not expose the equipment to excessive moisture (condensation) and do not submerge in any liquid.
4. 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.
5. 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.
6. A factory-qualified service technician must perform component service and repairs. Please contact SIMCO Customer Service for information.

SECTION 3 IONforce bar Specifications

Input Voltage:	+/- 3.5 KV DC minimum, +/- 14 KV DC maximum
Input Current:	+/- 0.50 A nominal per emitter point
Gas Supply (Optional)	Clean dry air (CDA) or Nitrogen, 170 kPa (25psi) nominal, 310 kPa (45psi) maximum
Emitter Electrodes:	High purity tungsten (standard) or Silicon Carbide (optional)
Emitter Housing:	Polyester
Top Cover:	Stainless Steel
Bottom Cover:	Polycarbonate
End Cap(s):	Polycarbonate
Operating Temperature:	0° to 70° C ambient (32° to 158° F)
Relative Humidity:	0% to 85% non-condensing
Nominal Weight:	0.16kg per 305mm (0.35 lb. per 12")
Overall Dimensions:	See Figure 1
HV Cable (Standard):	2340mm (92") Long, 20 kV Rated with PVC jacket
HV Cable (Optional):	2340mm (92") Long, 20 kV Rated, RoHS compliant

Important: 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.

EMITTER ELECTRODE CLEANING:

1) Visually inspect each emitter electrode for signs of deposited material.
2) SIMCO 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.

EMITTER ELECTRODE AND 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 tools.
   See "Replacement Parts" list for specific information.
2) See the instructions included with the tool for replacement procedure.
3) Following replacement, Turn the power on to the Controller unit and calibrate the IONforce bar per instructions in the operation manual.
   A ½ hour "conditioning" period is recommended for an IONforce bar with new electrodes prior to returning to a cleanroom location.

SECTION 5 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). Adjust the gas pressure to the bar per specifications.
3) 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.

SECTION 6 Maintenance

Periodic maintenance of the IONforce bar is recommended to ensure optimum performance. Harsh environmental conditions such as high temperature, high relative humidity, airborne contaminates, 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 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.
   - Deionized or distilled water (do not use unfiltered or "tap" water)
   - Isopropyl alcohol (do not use butyl alcohol or ether)

3) 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.

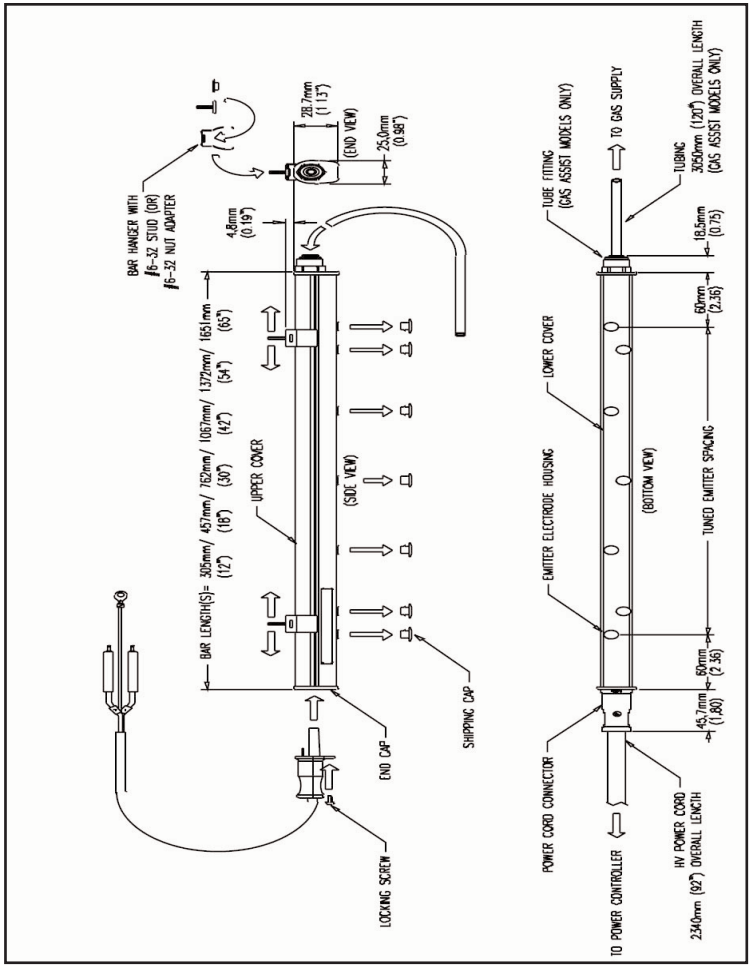

Figure 1 - IONforce Bar

SECTION 4 Installation

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.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 762mm (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 Customer Service for additional information.

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.
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.

3) 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.

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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.

4) 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.

5) 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.

6) Route and secure the bar power cord and gas tubing clear of all sharp edges and moving parts within the equipment.

7) 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.

8) Remove the orange shipping caps from the emitter electrode housings along the bottom of the bar.

9) Verify that the Controller unit power cord is connected to a properly grounded outlet of the correct voltage and phase.

10) 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.

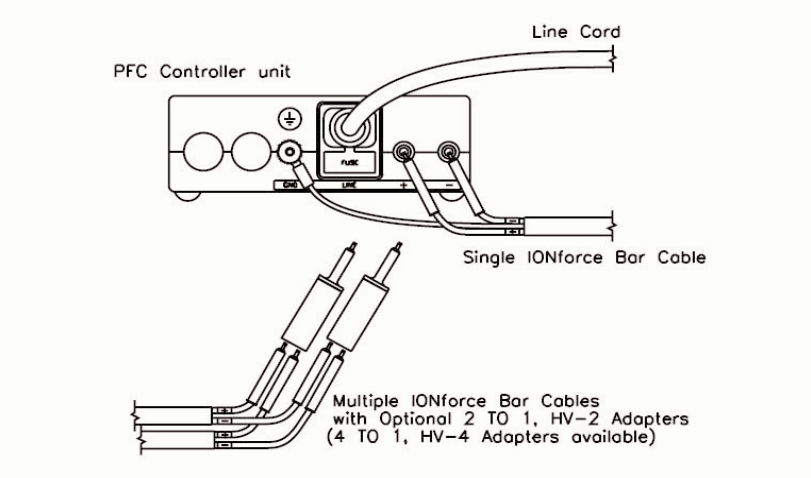

Figure 2- IONforce bar connections to PFC Controller unit

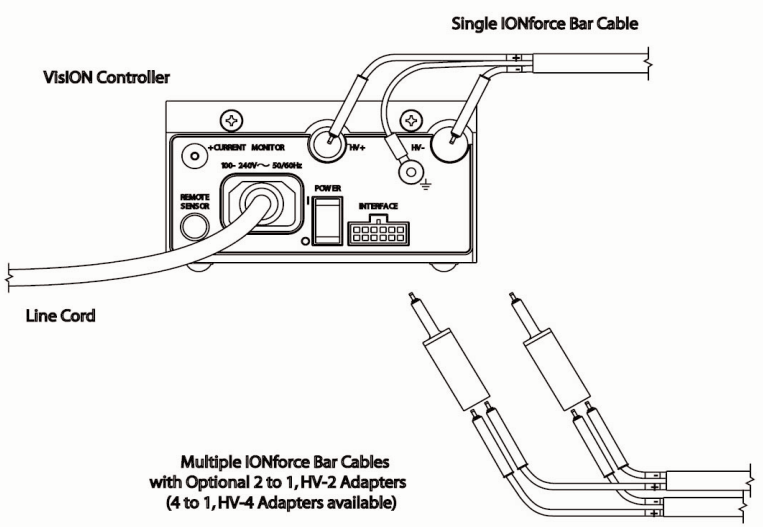

Figure 2- IONforce bar connections to VisION Controller unit