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Chargebuster Overhead Ionizer Operation, Installation, and Maintenance



Figure 1. Desco 60473 Chargebuster Overhead Ionizer

Description

The Desco 60473 Chargebuster Overhead Ionizer is a three fan, dual steady state DC auto-balancing overhead ionizer. The unit is normally hung above the area to be neutralized. The ionizer's discharge times will be best 18" to 24" directly above the work surface. It can be mounted higher but discharge times will increase as the distance increases.

"Necessary non-conductors in the environment cannot lose their electrostatic charge by attachment to ground. Ionization systems provide neutralization of charges on these necessary non-conductive items (circuit board materials and some device packages are examples of necessary non-conductors). Assessment of the ESD hazard created by electrostatic charges on the necessary nonconductors in the work place is required to ensure that appropriate actions are implemented, commensurate with risk to ESDS [ESD sensitive] items". (ANSI/ESDS20.20-2007 Foreword)

"In order to mitigate field-induced CDM [Charged Device Model] damage, the ESD program shall include a plan for the handling of process-required insulators. If the field exceeds 2,000 volts/inch, steps shall be taken to either: A) Separate the insulator from the ESD-sensitive device by a distance of 30 cm (12 inches); or B) Use ionization or other charge mitigating techniques to neutralize the charge." (ANSI/ESDS20.20-2007 section 8.3)

"Ionization or other charge mitigating techniques shall be used at the workstation to neutralize electrostatic fields on all process essential insulators if the electrostatic field is considered a threat. All process essential insulators that have electrostatic fields that exceed 2,000 volts should be kept at a minimum distance of 12 inches from ESDS items." (ANSI/ESD S20.20 section 6.2.3.1. and 6.2.3.2)

"The primary method of static charge control is direct connection to ground for conductors, static dissipative materials, and personnel. A complete static control program must also deal with isolated conductors that cannot be grounded, insulating materials (e.g., most common plastics), and moving personnel who cannot use wrist or heel straps or ESD control flooring and footwear.

Air ionization is not a replacement for grounding methods. It is one component of a complete static control program. Ionizers are used when it is not possible to properly ground everything and as backup to other static control methods. In clean rooms, air ionization may be one of the few methods of static control available." (ESD Handbook TR20.20 Ionization, section 5.3.6.1)

"All ionization devices will require periodic maintenance for proper operation. Maintenance intervals for ionizers vary widely depending on the type of ionization equipment and use environment. Critical clean room uses will generally require more frequent attention. It is important to set-up a routine schedule for ionizer service. Routine service is typically required to meet quality audit requirements." (ESD Handbook TR 20.20 section 5.3.6.7 Maintenance / Cleaning)

Packaging

- 1 Chargebuster Overhead Ionizer
- 1 Hanging Kit
- 1 Power Cord
- 3 Emitter Point Cleaners
- 1 Certificate of Calibration

Installation

Before installing the unit, verify that the AC outlet is properly connected to ground. The unit must have a good ground to maintain proper balance. Install the unit in the desired location, making sure that the airflow will not be restricted. Be sure the "OFF / ON" switch located on the rear of the unit is in the OFF position. Plug the power cord into the unit and then into the appropriate AC power source.

Status of the unit can be monitored remotely via the RS485 data ports. Please contact the manufacturer for more information.

Operation

Set the fan speed switch on the rear of the unit to the LOW, MED, or HIGH position. Higher airflow will result in faster discharge times. Position the unit so that the maximum airflow is directed at the items or area to be neutralized. Turn the unit ON.

When the unit is first turned on, it will conduct a self-test. The audible alarm will sound and then the LED will cycle through RED, YELLOW, and GREEN. The LED will remain GREEN during normal operation.

BALANCE (OFFSET VOLTAGE) ADJUSTMENT

The Chargebuster Overhead Ionizer is an auto-balancing unit. However, tuning or manual adjustment can be accomplished by inserting a small screwdriver or trimmer adjustment tool into the balance (offset voltage) adjustment hole located on the front of the unit. To increase the output in a positive direction, turn the potentiometer in a clockwise direction. Conversely, to increase the output in a negative direction, turn the potentiometer in a counter-clockwise direction. Once the desired balance point has been achieved, the alarm reset button must be pressed to set the balance point.

MAINTENANCE / ALARMS

If the supply voltage drops from 120 Volts to below 85 Volts, the unit will shut down, the audible alarm will beep, and the LED will blink RED. The unit will automatically reset when the minimum voltage is restored.

Under normal conditions the ionizer will attract dirt and dust (especially on the emitter electrodes). To maintain optimum neutralization efficiency and operation, cleaning should be performed on a regular basis.

When the unit enters shutdown mode, ionization will be stopped, the LED on the front of the unit will change to a steady RED, and the audible alarm will sound continuously. If the ionizer enters shutdown mode, it must be turned OFF and then back ON to reset the unit.

NOTE: The AC power cord MUST be disconnected before the unit is disassembled for maintenance. The emitter electrodes should be cleaned using the included cleaners or a swab damp with isopropyl alcohol. First, turn the unit OFF and unplug the power cord. Then remove each fan grill located on the top-side of the ionizer by disengaging all 4 screws per grill. Clean all emitter electrodes. After cleaning the emitter electrodes, reattach all the removed grills. Plug in the power cord and turn the unit back ON.

The emitter electrodes should not require replacement during the life of the unit with normal handling. Replacement emitter electrodes can be ordered if necessary.

The best practice would be to verify the balance (offset voltage) of the unit with a charged plate monitor after cleaning.

NEUTRALIZATION (DISCHARGE) TIMES

The comparative efficiency of bench top ionizers is determined by a standard test published by ANSI/ESD S3.1. Typical positive and negative discharge times (in seconds from 1000 volts to 100 volts and from -1000 volts to -100 volts) measured using this standard are shown below. The performance of the ionizer was measured with the unit positioned as shown, with the fan speed on high, and without a filter.

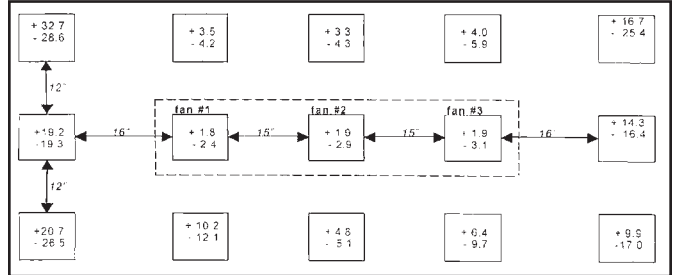


Figure 2. Neutralization (discharge) times

Note: Reference ANSI/ESD STM 3.1. The distance from the ionizer to the charge plate is 18".

Specifications:

AIR FLOW

Three speed fans (125fpm -250fpm; 50-100cfm)

BALANCE (OFFSET VOLTAGE)

±10 volt, typical; ±20 volts maximum at 65°F to 80°F, R.H.: 15% to 65%

CHASSIS

White powder coated steel housing

DIMENSIONS

3.5" H x 6.5" W x 37" L
(8.9cm H x 16.5cm W x 94.0 cm L)

EMITTER POINTS

.050" diameter pure tungsten for improved mechanical strength and ionization stability

FUSE

400mA slow blow

HIGH VOLTAGE POWER SUPPLY

5.5 kV DC nominal

INPUT POWER

AC line power, 120 VAC, 50/60Hz

ION EMISSION

Steady state DC with sense feedback

MOUNTING

May be rigid-mounted or suspended from ceiling

OZONE

Less than 0.05ppm

WEIGHT

10 lbs. (4.54 kg)

Calibration

NOTE: A charged plate analyzer must be used in order to properly calibrate the Chargebuster Overhead Ionizer. Desco EMIT offers the 50555 Charged Plate Analyzer.

- I. Properly setup the ionizer as described in the Installation procedure on page 1.
- II. Turn the unit ON and set the FAN SPEED to HIGH.
- III. Position the charged plate analyzer 18 inches underneath one of the fans of the Chargebuster Overhead Ionizer.
- IV. Push and hold the ALARM RESET button on the ionizer until the STATUS LED turns red (see Figure 3). Release the button and the LED should switch back to green. This allows the user to calibrate the balance (offset voltage) of the ionizer without setting off the alarm.



Figure 3. Calibration controls

- V. The balance (offset voltage) of each fan should be within 0 and ± 15 volts. To increase the output in a positive direction, turn the BALANCE ADJUST potentiometer in a clockwise direction. To increase the output in a negative direction, turn the BALANCE ADJUST potentiometer in a counter-clockwise direction.
- VI. Test the neutralization (discharge) time by applying a $\pm 1,000$ volt on the charged plate. The neutralization (discharge) time should be less than 3 seconds for each fan.

VII. Submit the balance (offset voltage) to the ionizer's alarm by quickly pressing the ALARM RESET button. The STATUS LED should turn off and then illuminate green to verify that the alarm was successfully programmed.

VIII. Test each fan's alarm by shorting its two grills located on the bottom side of the ionizer (see Figure 4). The alarm should sound and the STATUS LED should illuminate red.



Figure 4. Shorting the ionizer's two fan grills

Limited Warranty

Desco expressly warrants that for a period of one (1) year from the date of purchase Desco Chargebuster Overhead Ionizers will be free of defects in material (parts) and workmanship (labor). Within the warranty period, a credit for purchase of replacement Desco Chargebuster Overhead Ionizers, or, at Desco's option, the Chargebuster Overhead Ionizer will be repaired or replaced free of charge. Call our Customer Service Department at 909-627-8178 (Chino, CA) or 781-821-8370 (Canton, MA) for a Return Material Authorization (RMA) and proper shipping instructions and address. Please include a copy of your original packing slip, invoice, or other proof of date of purchase. Any unit under warranty should be shipped prepaid to the Desco factory. Warranty replacements will take approximately two weeks.

If your unit is out of warranty, call our Customer Service Department at 909-627-8178 (Chino, CA) or 781-821-8370 (Canton, MA) for a Return Material Authorization (RMA) and proper shipping instructions and address. Desco will quote repair charges necessary to bring your unit up to factory standards.

Warranty Exclusions

THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED. The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

Limit of Liability

In no event will Desco or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.