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Chargebuster Ion Gun Installation, Operation and Maintenance



Figure 1. EMIT Chargebuster Ion Gun

Description

The EMIT Chargebuster Ion Gun is a Point-of-Use Ionizer. It uses compressed air or nitrogen to neutralize static charges in localized areas. Most companies address ElectroStatic Attraction, visual imperfections, and contamination issues by dislodging charged dust and debris with compressed air ionizers. "There is sometimes a need to provide static control in a small defined area or location. This may be done to provide static control within production equipment, in mini-environments, or to facilitate particle removal from part of a product. Ionizers used for this purpose may be blow-off guns or nozzles that work with a supply of compressed air or nitrogen. They may use either nuclear, soft x-ray or any of the previously described types of corona ionization technology. It will be important to choose a method of ionization and cleanliness of the gas supply that is appropriate to the work area." (ESD handbook ESD TR20.20 section 5.3.6.5.2.4 Point-Of-Use Ionization)

The modular and ergonomic design includes an ESD protective flexible hose and is easily controlled by depressing the trigger. The EMIT Chargebuster Ion Gun meets or exceeds the required limits of ANSI/ESD S20.20 when tested in accordance with ANSI/ESD S3.1 and ESD TR53.

Compact and lightweight, the Chargebuster Ion Gun's console can be mounted anywhere on the workstation for easy access. The console connects to any supply of clean dry air or nitrogen, and an internal disposable filter collects residual particles, oil and moisture. The console, gun, and air hose are static-dissipative. The 7 foot hose allows for convenient neutralization of localized areas where desired.

The Chargebuster Ion Gun reduces a static charge of ± 1000 V down to ± 100 V in less than one second at a distance of six inches (30-psi /0.2MPa inlet pressure). Refer to the ESD Association ANSI/ESD Standard STM3.1 for the test procedure. The offset voltage (balance) is within ± 30 V of zero at a distance of six inches, significantly less than the required limits of $< \pm 50$ volts per ANSI/ESD S20.20.

"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/ESD S20.20-2007 Foreword)

"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)

The Chargebuster Ion Gun is available in two models:

Item	Power Adapter Input
50644	220VAC
50645	120VAC

Packaging

- 1 Chargebuster Ion Gun with Hose
- 1 50646 Air Filter
- 1 24VAC Power Adapter
- 1 10' Cable
- 1 Mounting Plate
- 1 Quick Coupling
- 1 S-Hook
- 4 Screws
- 1 Certificate of Calibration

NOTE: A power cord must be purchased separately for the 50644 Ion Gun. Use the 50545 power cord for Europe and the 50546 power cord for UK/Asia.

Features and Components

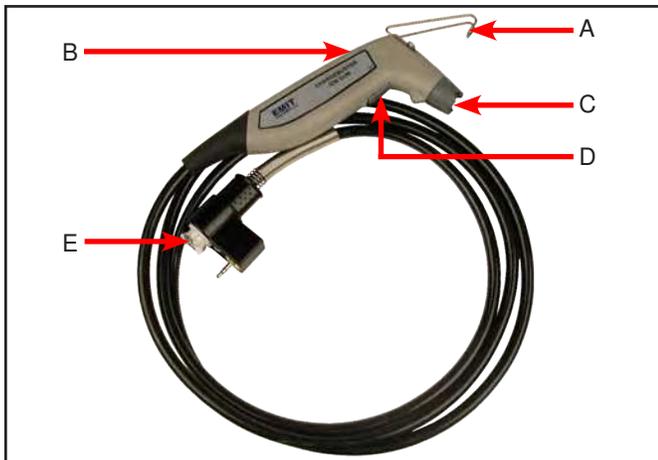


Figure 2: Gun and hose features and components

GUN AND HOSE

- A. Hanging Clip:** Use to hang the gun on an apparatus. May also be used with the included S-Hook.
- B. Status LED:** Illuminates when the trigger is held down. Indicates when the gun is outputting ionized air.
- C. Nozzle:** Outputs ionized air when the trigger is held down.
- D. Trigger:** Hold down to output ionized air.
- E. Filter Connection:** Hold down the metal tab to attach or release the disposable filter.

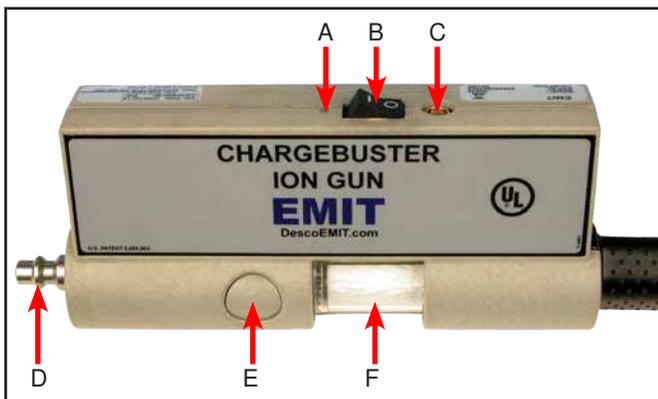


Figure 3: Console features and components

CONSOLE

- A. Power LED:** Illuminates when the power is turned ON.
- B. Power Switch:** Turns the power ON or OFF.
- C. Foot Switch Jack:** Connect the optional foot switch here. Contact Service@DescoEMIT.com for more information.
- D. Supply Connection:** Use with the quick coupling to connect to an air supply.

E. Disposable Filter Release / Lock Button: Push down to release the disposable filter and hose assembly from the console. This button should also click when properly attaching the disposable filter and hose assembly to the console.

F. Disposable Filter: Filters particles, oil and moisture from the incoming air supply.

Installation

COMPRESSED GAS REQUIREMENTS

NOTE: Failure to use clean dry air or nitrogen may result in damage to the Chargebuster Ion Gun that is not covered under the Limited Warranty.

The compressed gas supply must be clean dry air or nitrogen supplied by a delivery system that utilizes a refrigerated dryer or equivalent water removal to achieve a limit of about 550 ppm water vapor at 35°F (1.66°C) Dew Point. To prevent particles from entering the console, a 2 micron coalescing filter or better is recommended upstream of the gun console. Note that the filter in the console collects small residual particles and aerosols and does not act as a primary filter. The console filter is rated at 0.01 micron for particulates and is effective down to 0.008 micron for aerosols.

An adequate filter that can be recommended for the inlet of the Chargebuster Ion Gun would be a Finite Filter Grade 10 Media Specification. This provides a 95% coalescing efficiency for aerosols with a 0.7 micron (and greater) particle retention. This removes gross amounts of particles, water and/or oil and aerosols.

A Grade 6 Media provides 99.98% efficiency when almost total removal of liquid aerosols and particles are required in all pressure ranges down to 0.01 microns. Fine filters need to be changed more often.

MOUNTING THE CONSOLE

Plug one end of the included 10' cable into the jack on the back of the console. Plug the other end of the cable into the unplugged Wall Transformer.

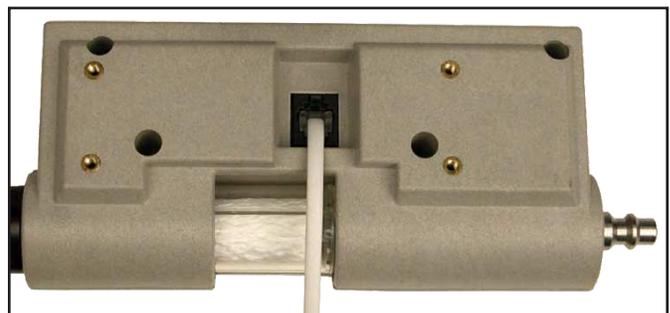


Figure 4: Connecting the cable from the Wall Transformer to the back of the console

Choose a location that will be convenient to the work area and the gas supply. The Console takes up very little space and is adaptable to a variety of permanent or temporary installations. To minimize bends in the gun hose, orient the console so that the open end points toward the work area and the male connector points toward the air supply.

1. Use the included screws to attach the supplied mounting plate to the threaded holes on the back of the console.

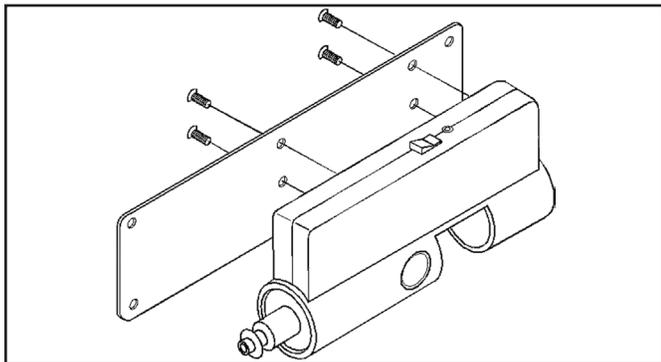


Figure 5: Mounting the console to the mounting plate

2. Attach the plate to a flat surface, such as a wall or back of a work bench, using suitable screws and fasteners. When mounting to a hollow wall be sure to use #8 screws and 3/4" length anchors as a minimum.

MOUNTING TO A GAS SUPPLY

When a gas supply is close to the work area and fitted with a standard industrial interchange quick coupling, you may attach the console to the air supply fitting directly. If necessary, use a prefilter as defined in the COMPRESSED GAS REQUIREMENTS section of this technical bulletin.

ASSEMBLY

NOTE: Protect the hose from sharp objects, abrasion, and high temperatures. Do not pull or pinch the hose while assembling the components.

1. Insert the larger diameter end of the air filter into the end of the flexible air hose connector. Press the metal filter release tab at the end of the hose until it locks into place.

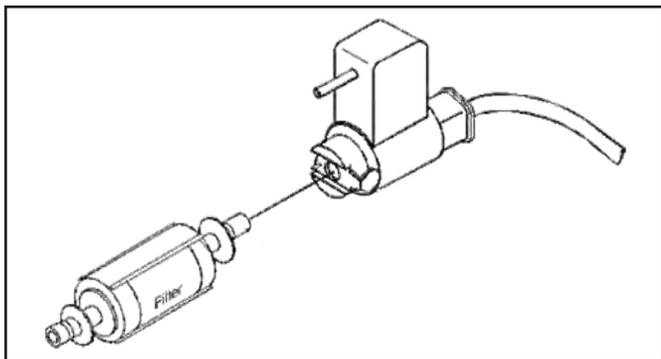


Figure 6: Inserting the disposable filter

2. Connect the hose and disposable filter to the console. Press the disposable filter release button on the front of the console to lock it down. Push the fitting containing the disposable filter all the way into the opening in the console until it latches with a click. It fits only in the correct orientation. The small plastic fitting on the end of the disposable filter must align with the metal guide coupling in the console. You may have to wiggle the disposable filter slightly while inserting it.

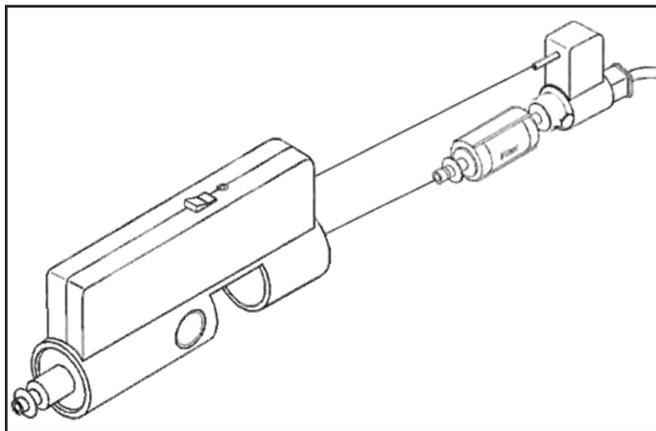


Figure 7: Connecting the hose and disposable filter to the console

3. Attach the included 1/4" NPT female quick connect fitting to your gas supply line. Slide the outer ring on the fitting towards the supply line to insert the mating fitting on the console. You can attach the console directly to the gas supply pipe or attach it using a hose (not supplied). If necessary, use a prefilter as defined in the COMPRESSED GAS REQUIREMENTS section of this technical bulletin.
4. If you would like to use the optional foot switch, plug its cable to the jack located at the top of the console.

Operation

NOTE: Our recommendation is to set the pressure regulator on your air or nitrogen supply between 20 and 65 psi (0.14-0.45 MPa). Discharge times vary depending on air pressure.

Pressures of 30-40 psi (0.2-0.28 MPa) are commonly used for decontaminating surfaces. OSHA regulations recommend limiting hand-held air blow-off devices to maximum pressures of 30 psi (0.2 MPa). The hose is rated at 65 psi (0.45 MPa) at temperatures up to 75°F (24°C), and the rating decreases at higher temperatures. When using high pressures, consider the ambient room temperature as well as heat from surrounding equipment.

1. Ensure that you are not holding down the trigger, and turn on the power switch located at the top of the console. The power LED should illuminate.

2. Hold the gun approximately six inches from the surface you want to neutralize and blow-off. Aim the nozzle and hold down the trigger. The LED on the back of the gun should illuminate. Typically, static charges are discharged within one second.
3. Release the trigger when the surface is clean.

If the optional foot switch is installed, you may use either the foot switch or gun trigger.



Figure 8: Using the Chargebuster Ion Gun

Maintenance

“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)

CLEANING THE COMPONENTS

1. Turn off the console and disconnect it from its electrical power and gas supply sources.
2. Using a cloth moistened with the IPA solution, wipe the exterior surfaces of the console and gun to remove any dirt or dust that may have collected.
3. Using a swab moistened with the IPA solution, gently clean the emitter points on the gun. Extremely dirty points increase the time needed to discharge static and can affect the ionization balance.

REPLACING THE DISPOSABLE FILTER

EMIT recommends that the disposable filter be changed every 3 months or when it begins to look dirty.

1. Turn power off at the console and disconnect the console from the gas supply.
2. Hold down the disposable filter release button on the side of the console.
3. Remove the hose and disposable filter from the console by pulling the textured rubber plug where the hose emerges from the console. Rocking the plug back and forth can help loosen the filter. Do not pull the hose itself.
4. Remove the disposable filter from the hose fitting by depressing the metal release tab on the fitting and pulling off the air filter.
5. Replace with the new disposable filter by following the procedure in the ASSEMBLY section on page 2.

Specifications

Operating Voltage	120 VAC, 60 Hz (item 50645) 230 VAC, 50 Hz (item 50644)
Operating Temperature	32°F - 104°F (0 - 40°C)
Discharge (±1000V-100V)	1.0 s @ 6", 30 psi
Cleanroom Class	Meets ISO 14644-1 Class 4
Console Power	24 VAC from power adapter
Ion Emission	Steady-state DC
Emitter Points	Tungsten emitter points
Audible Noise	70 dBA @ 1m, 30 psi
Ozone	<0.005 ppm
Blow-off Force	41g @ 30 psi; measured @ 3" from a 2" diameter target
Volumetric Flow Rate	3.0 SCFM @ 25 psi 3.5 SCFM @ 30 psi 4.0 SCFM @ 35 psi
Air Hose	Static-dissipative polyurethane, 3/8" OD, 7' length, 65 psi
Gas Input	20-65 psi, Clean Dry Air (CDA) or nitrogen
Gas Connection	1/4" male industrial interchange quick connect
Gas Air Filter	99.9% efficient, 0.1 micron or larger

Mounting	Metal mounting plate attaches to back of console
Enclosure	Gun / Console: static dissipative polycarbonate
Gun Dimensions	8" L x 3" W x 1" H
Console Dimensions	8.5" L x 3.0" W x 1.6" H
Gun Weight	12 oz
Console Weight	11.5 oz
Certifications	CE, UL, RoHS Compliant

**Limited Warranty, Warranty Exclusions, Limit of
Liability and RMA Request Instructions**

See EMIT's Warranty -

<http://emit.descoindustries.com/Warranty.aspx>