

IRIS Room Ionization System Operation and Maintenance Instructions



Made in the
United States of America



Figure 1. EMIT 50800 IRIS Power Supply

General Information

Ionizers are useful in preventing electrostatic charge generation, ElectroStatic Discharge, ElectroStatic Attraction, as well as preventing equipment latch-up. Per ANSI/ESD S20.20 section 6.2.3.1. Protected Areas Requirement states: "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." Air ionization can neutralize the static charge on insulators (which cannot be grounded) and isolated conductors (which are not grounded) by producing separate charges in the molecules of the gases of the surrounding air. When an electrostatic charge is present on objects in the work environment, it will be neutralized by attracting opposite polarity means of charges from the ionized air. Note that ionization systems should not be used as a primary means of charge control on conductors or people. [Reference: EN 61340-5-2 clause 5.2.9].

The EMIT IRIS Room Ionization System is a pulsed system generating both polarities of ions at each single emitter unit. It operates on alternating current (AC).

The EMIT IRIS Room Ionization System meets the ANSI/ESD S20.20 required limit less than ± 150 volts offset voltage (balance) tested in accordance with ANSI/ESD STM3.1. Per S20.20 Discharge Time required limits are "user defined". Compliance Verification per ANSI/ESD S20.20 is to be per ESD TR53 using a Charged Plate Monitor or a SP3.3 Ionization Test Kit.

Features

- Bi-polar ionization from a single emitter tip - yields unsurpassed ion production
- Lightweight modular emitter system - no heavy power supplies mounted overhead, easy to maintain emitters, easy to change room layout
- Precision sensing and cycle timing - offers superior offset voltage balance
- White ABS construction - superior cleanroom performance
- Powered by a digital, high-accuracy, laboratory grade power supply - only one power supply needed per 300 emitters or 3,500 square feet, substantially decreasing calibration time
- Controlled by a single personal touch screen computer interface
- Uninterrupted 24/7 operation - no operator interaction required

Benefits

- Excellent performance in charge decay discharge times and particulate control - fully adjustable and biased ion output
- Industry leading total cost of ownership (TCO) - Single power supply architecture substantially reduces up-front investment and subsequent maintenance costs compared to other systems on the market
- Reduced oversight by QA and production control - built for unattended operation; lowest maintenance cost in the industry
- Flexible modular design - installation can be modified, added to, or moved without special tools or skill sets

Absolute protection for your critical processes

The EMIT 50800 IRIS Room Ionization System creates a static protective environment for your ESD sensitive items by reducing static charges on surfaces and particles. Controlling the potential difference in voltage controls the attraction or discharge that could result. Without mutual attraction, a particle will remain suspended in the airflow, moving harmlessly by the process and exiting through the air handler. Controlling surface charge and static contamination is a key component of optimal product handling procedure in a high yield environment. The EMIT IRIS system controls the threat of electro-static attraction of particles and ESD device damage.

Maintains a Safe Process Environment

Produces a large volume of ionized air, which neutralizes charges to ensure that objects and sensitive products stay within process specifications.

Optimal Control

Meet the specific demands of your industry. Control peak-to-peak voltages for photo mask, hard drive, ESD sensitive device or tools.

Flexible Installation

The modular design allows future expansions and changes with no special tools.

Uptime and Ease of Maintenance

Built in software calibration, system monitoring and periodic cleaning ensure peak process efficiency with minimal personnel involvement.

Potential ESD damage is controlled within process specifications of the end user. Photo mask and other product protection demand controlled peak-to-peak voltages to maintain the proper level of safety. These are basic set up criteria that can be determined based on your needs and the discharge times required.

You can be confident a process sensitive to static charge is in an optimal environment to operate smoothly providing the maximum uptime and process efficiency.

The modular installation of the IRIS Room Ionization System allows future expansions to be added as needed. The system is simple to maintain with periodic cleaning and built-in software calibration.

IRIS Room Ionization System Benefits

Single Emitter Point Delivery System

Because there is no opposite residual charge at a second emitter point in close proximity, there is less recombination between ions of opposite charge near the emitter point. This produces a very minimal instance of the charged ion striking the electrode surface during the ionization process and attracting trace molecules that build up on the electrode surface and compromise performance. This benefit causes the emitter to last much longer than on other types of ionization and maintenance is dramatically reduced. The Single Emitter Point Delivery System benefit reduces maintenance dramatically and emitter points last much longer compared to paired emitter ionization systems.

Alarm Feedback System

The IRIS Room Ionization System incorporates 3 external sensors to monitor the offset voltage balance and signals an alarm when needed. Many other ionization systems rely on an internal voltage monitor to set alarm windows. The result of an internal alarm is that the system alarm has no real environment data to use in the alarm set up, only suggested data that could be present. The benefit of tying the system feedback to real environment data is that any environment change can be alerted to the system software for reporting. This could include changes in airflow or disconnected ion bars.

Adjustable Delay between Pulses

This feature is a necessity in room systems to allow the added adjustment to set up for all types of laminar airflow and still control the maximum peak to peak voltage. This benefit places a layer of neutral air between the production of positive and negative ions, allowing each to expand and fill the voids more evenly without recombination of ions. This also provides an air insulator between the pulses of the Single Emitter Point Delivery System of the IRIS Room Ionization System.

Ease of Installation and Re-Configuration

The IRIS Room Ionization System uses components that can be easily snapped together for set-up or un-clipped to make simple changes. We use a minimum of permanent adhesives or fasteners to install the system so that the customer has the ability to make future moves or additions with little difficulty. The benefit to the customer is greater control over their own facility and less dependence on outside contractors.

TEAM5 IRIS

Client Software - The TEAM5 IRIS Client Software is designed to calibrate and monitor one IRIS Zone. The Client Software can operate in standalone mode or in conjunction with the TEAM5 IRIS Server software to report status of the zone and to synchronize power cycles and administrative settings such as passwords.

Server Software - The TEAM5 IRIS Server software is designed to monitor and control multiple IRIS Zones. The Server Software continuously monitors zones and alerts key personnel in the event of a zone alarm. Additionally, the Server Software controls settings like password controlled access to key functions and scheduled shutdowns of zones at specific times.



Figure 2. TEAM5 IRIS Client Software in operation on an enclosed tablet PC

Reduced Maintenance Time

This benefit has been a key feature for companies that maintain their own systems. Our customers estimate that the maintenance time they spend has been cut by 60-75% in the areas they have installed the IRIS Room Ionization System. This benefit gives maintenance cost savings that can be anticipated for years to come.

System Expandability

Each IRIS Smart Power Supply can control up to 3,500 square feet with 300 emitter points. This is 2 or 3 times the size of most ionization systems. When more than one IRIS Power supply is installed in a room, the Synchronize IRIS options should be selected on the Admin Options window. When selected, the Pos / Idle / Negative power cycles will be synchronized with the system clock on the Client computer. This ensures that the multiple power supplies will switch Pos / Idle / Negative cycles at the same time.

Important Note: For Synchronization to be effective, the Pos / Idle / Neg power cycle timers should be identical of each of the synchronized IRIS Zones.

The benefit of this system size potential is that it allows for additions to be made within the framework of the system capabilities for most applications.

System Description

General: The IRIS Room Ionization System is capable of providing free positive and negative ions through switching high voltage to groups of emitters located throughout the area of coverage needed. Total free ion concentration is controlled by changing the voltage levels and length of pulse. Higher voltage and longer overall pulse duration will produce a greater number of free air ions. Ion offset voltage balance is set to an optional point by controlling the "ON" time ratio between positive and negative pulses to the emitter point.

Computer and Software: Each room or zone is independently controlled by touch screen PC to eliminate single point of failure. Server software available providing summary status of each room or zone. Software is capable of logging all significant events to a database so the owner may analyze system operations and assure compliance with ISO-9000 and ANSI/ESD S20.20 requirements.

System Performance: See specifications. Offset voltage balance and discharge times are tested using a charged plate analyzer per ANSI/ESD STM3.1.

Installation: Ionization system consists of conduit bars, attached to the ceiling of the room utilizing stainless steel brackets. These brackets will attach to standard 2'x4" drop ceiling, with or without HEPA filters. The brackets and hangers will be mounted to allow changing lights and filters with a minimum of interference.

Specifications

Description:

Single-wire, bipolar, corona ionization system conforming to ANSI/ESD S20.20 tested per ANSI/ESD STM3.1 and ESD TR53

Charge Decay (Discharge Time):

±1000V to ±100V in 300 seconds or less (60 seconds typical)

Input Voltage:

90VAC to 260VAC, 47 to 63Hz, 65 W

Input Connector:

IEC 60320-1 C-14

Open Circuit Output Voltage:

0 kVDC to 10 kVDC ±5%

Short Circuit Output Current:

100 µA MAX digitally controlled, additional current limitation via 100 megohm series resistor

Emitter Capacity:

300 per power supply

Emitter Control:

fully programmable, 0-99.9 second ionization ON cycle for each polarity with selectable quiescent periods between cycles

Power Supply Indicators:

power ON, alarm, positive and negative voltage output and neutral delay

Zone Sensors:

Independent, cylindrical detectors with BNC connectors, RG58 or equivalent cabling (provided)

Power Supply Dimensions:

8.17" W x 19.5" H x 6.0" D
(20.75cm W x 49.5cm H x 15.24cm D)

Power Supply Weight:

30 lbs. (11.2 kg)

Offset Voltage (Balance):

<±150V per ANSI/ESD S20.20

Calibration:

Semi-annual calibration recommended

“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).” ANSI/ESD S20.20 section Foreword

“In order to mitigate field-induced CDM (Charge 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/ESD S20.20-2007 section 8.3

“Room ionization devices are used when static problems occur over a wide production area and it is difficult to localize the problem to a particular workstation.” ESD Handbook ESD TR20.20 section 5.3.6.5.2.1 Room Ionization

IRIS Amendment

Intelligent Room Ionization System Installation Includes:

- Installation
- Configuration
- Calibration

The performance of the EMIT IRIS – Intelligent Room Ionization System is directly related to uniform airflow throughout the area being ionized. Minimum laminar airflow of 70 FPM and distance from emitter to test surface of 5' is necessary to enable the system to meet Offset Voltage (Balance) and Voltage Decay (Discharge Times) performance specifications. In the event that minimum environment specifications cannot be met, some system modification may be required. In addition, some large objects (machines, etc.) may have a significant effect on the ionization performance in the vicinity of the objects.

Upon completion of IRIS Installation, IRIS will be calibrated to the required limits of ANSI/ESD S20.20 with offset voltage of less than +/-150V, as well as predetermined decay times agreed upon by both customer and EMIT tested per ESD TR53. Any changes to the environment of the IRIS installation Scope of Work after the installation may require modifications and recalibration. This includes and is not limited to airflow changes to the environment, layout changes (including work benches and machinery). All ionizers require periodic maintenance, emitter pin cleaning, and recalibration. Associated costs are not included in the original purchase price. All testing and recalibration of the IRIS performed after installation will be quoted to the customer for parts and labor separately from the initial Quotation and Purchase Order.

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

See EMIT's Warranty -

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