IONIZER USER MANUAL

Model 7380d

AirStat® Steady-State DC Bar Ionizer

Version 1.0

CORE INSIGHT
코어인사이트(주)

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Contents

1 Introduction

Core Insight, Inc. is an ionization system manufacturer and supplier to ESD and contamination control application. Core Insight, Inc. also provides ESD Test and Measurement equipment, Professional Static Auditing Kits, EMI Noise Filters and EOS/ESD Technical Services such as ESD Training, Process Assessment, ESD Control Program Development and Product Qualification Testing per ANSI/ESD Standards.

Core Insight, Inc. is a leading company for ESD and contamination control in the fields of semiconductors, flat panel displays, automotive, and general electronic manufacturing industries. Core Insight, Inc. was founded in 2003 and business partnership with ProStat Corporation, ON Filter, Monroe Electronics, Electro-Tech Systems, and Dangelmayer Associates etc.

2 Ionization and Application

A. Ionization Theory

Ionization solution has been used many years in electronic industry. Electrical ionization technology is most common design for many applications. Some ionizers designed for ESD application and some of them are contamination control in high technology manufacturing environment. Both are different purpose and may not work in both applications. Follows are the brief summary of differernces and user guide for each applications.

B . Cleanroom Contamination Application

Electric field is one of strong force to attract particles on wafer, glass panel, printed circuit board and other insulator materials. To minimize this force, room ionization is the best solution in high technology and other cleanroom environment.

Pulsed DC ionization technology is the well known solution over many years to minimized air borne particle attraction in cleanroom environment. Using with laminar flow, generated ions can move long distance and wide coverage areas. This will significantly reduce the force between particles and sensitive devices such as wafer, flat panel display and medical items. In results, room ionization improves product yields and less losses.

C. ESD Control Application

Voltage (or Potential) difference is the reason why ESD event occurs and lead to device damage. Ionizer makes this voltage difference to the same or minimize the level between objects to avoid ESD damage or make it happen at the safe level.

Steady-State DC ionizer is provide high ion current to objects and maintain low peak (or offset) voltage on it. This makes minimize ESD risk in production and suitable for CDM ESD control in control program.

2 Ionization and Application

CoreStat® Self-Balanced Ionizers developed based on steady-state DC technology and upgraded the ground isolated power circuit design. It can maintain low peak (or offset) voltage performance by intrinsic balancing circuit design with longer maintenance cycle time. It does not require calibration or adjust to maintain low offset voltage and it needs to cleaning emitter points for decay performance.

D. AC Ionizations and Application

Core Insight, Inc. provides several AC ionization systems. Conventional AC ionizer for industrial applications such as roll to roll or winding & unwinding of paper, film and non-ESD sensitive areas. Bipolar Pulsed AC ionizer is output parameter adjustable technology to meet each application requirements. High Frequency AC has adopt piezo crystal power supply for neutralize charge on insulative materials in small package. AC ionizer generates more Ozone than DC in the environment and may cause of side effects in senstive device handling areas.

All ionizers peformed and tested per ANSI/ESD STM3.1 and other documents such as ANSI/ESD SP3.3, ANSI/ESD SP3.4 and ANSI/ESD SP3.5.

For more detail information about ionizer solution and technical support needed, please feel free to contact our sales representative at sales@coreinsight.co.kr or your local contacts.

3 Application Guide

A. Basic ESD Control

Basic ESD control is mendatory required to electronic industry. It follows simple principle to make equipotential between ESD sensitive items. Personal grounding, ESD safe worksurfaces and ESD safe packaging materials are the key control items in ESD protected area.

B. Ionization for CDM/CBE Controls

Due to automated process in high techonology manufacturing environment, Charged Device Model (CDM) or CDM-like ESD damage becoming a major portion of device failures. Industry Council agreed to reduction of CDM protection target level down to 125V level and will impact basic level of ESD control program and organization. Not only CDM, but also Charge Board Event (CBE) like ESD issues are increasing due to device complexity and stored large amount of charge on printed circuit board.

Strategic guidance has been proposed by the EOS/ESD Association. Lowering device charged voltage level and increasing resistance of contact materials are the key strategic elements to prevent or minimize ESD damage.

ANSI/ESD S20.20 standard requires maximum allowable field strength is 125 V/inch for 200 V CDM device. Low peak (or offset) voltage of ionizer performance is important for ESD sensitive device control and control program per S20.20 based.

Core Insight, Inc. provides intrinsic low peak balancing Steady-State DC Ionizers for CDM ESD control with less maintenance.

For more detail information about ionizer solution and technical support needed, please feel free to contact our sales representative at sales@coreinsight.co.kr or your local contacts.

Cautions and Personal Safety 4

A. Cautions

Use of proper input voltage to avoid damaging the system.

Verify the cabling and its connection between controller, junction box and individual ceiling emitters before turn on the system.

Disconnection cable from ceiling emiiters will damage the system.

Do not clean emiter point while the system is powered. This may result of additional contamination issue and possible electrical shock.

Do not open the system by un-authorized personnel while the system is powered. This will void the warranty and may result in addtional cost.

B. Personal Safety

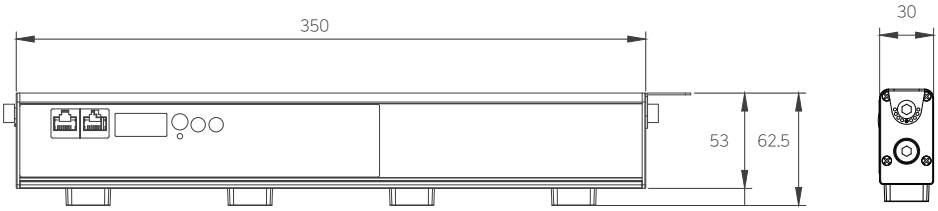
Before performing any maintenance on emitter points, it is highly recommended turn-off the system. Allow few minutes for high voltage power supplies to discharge.

5 Technical Specification

Input Voltage	24 V DC
Output Voltage	Up to ±4.0 kV, 10 V resolution adjustment
Ion Emission	Steady-State DC Technology
Ion Balance	Less than ±25 volts per ANSI/ESD SP3.5
Decay Time	Less than 2 seonds at 300 mm
Emitter Point	Single Crystal Silicon / 99.99% Tungsten
Air Pressure	Maximum 0.3 MPa. 0.2 MPa recommended
Air Inlet	6mm diameter air fitting
Display	4 Digit LED display / 2 Color LED
Output Control	IR remote controller, Model 5711R Output Voltage, On/Off Time Adjustment for each polarity
Alarm	LED and Audio Alarms
Output Monitoring	Relay Output - Open/Short
Material	Enclosure: ABS Bracket: Stainless Steel
Operating Environment	Temperature: 15~35℃ Humidity: 30~60% RH
Dimensions	62.5H x 30D x 350/590L mm
Option	IR Remote Controller
Warranty	2 years limited

Drawing 6

Various length of overall bar length are available from 350 mm to 590 mm



Setup and Operation 7

A. Introduction

Model 7380d AirStat® Steady-State DC Bar Ionizer is designed to provide very low offset ionization for the ultra ESD senstive device handling areas such as 3D IC semiconductor manufacturing process for advanced device packages. Steady-State DC Ionization technology does not generate induction field by AC switching voltages which could lead an ESD damage on device under ionization.

Model 7380d is designed for space limited environment within automated handling equipment (AHE) and manual processes.

7 Setup and Operation

B. Description of Model 7380d ionizer

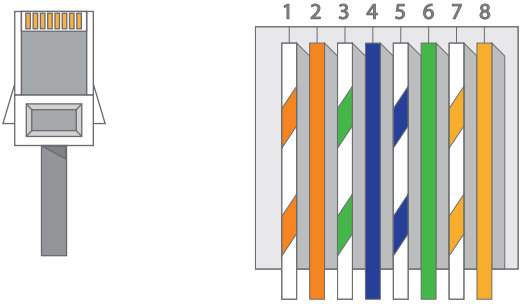
Model 5178D Power Adapter

Model 5711R Remote Controller

① Air Inlet for Clean Dry Air (CDA) or Nitrogen (N2) Gas
② RJ-45 Terminal: 24V DC Power Input and FMS Monitoring Output
③ RJ-45 Terminal for Daisy-Chained Power Connection and FMS Monitoring
④ LED: 4 digit display. Setting output parameter values and alarm level.
⑤ IR Receiver: Communicate with Model 5711R remote controller.
⑥ Status LED: Normal and Alarm (Two Color LED)
⑦ Control Button: Output Adjustment - FUN, UP, DOWN, OK
⑧ Emitter Nozzle Assembly: 4 emitters on single nozzle. Emitter point selection for Single Crystal Silicon and Tungsten Emitter Points

C. Installation

Determine the mounting locations of Steady-State DC bar ionizer at the workstation or automated handling equipment within 2 meters distance from Model 5178D DC power adapter or 24V DC source from the equipment. Standard ethernet cable CAT-5 or better is recommended for daisy-chain connection. Do not use cross cable or other combination could result of failure or damage to the ionizer. User must aware ionizer performance may change with or without air blockage or near grounded object on neutralization target.



Link IN - Wiring Cable					
No.	Color Code	Description	No.	Color Code	Description
1	Orange/White	24V DC (+)	5	Blue/White	N/A
2	Orange	N/A	6	Green	HVP Alarm
3	Green/White	24V Return (-)	7	Brown/White	N/A
4	Blue	N/A	8	Brown	HVP Common

Normal Open / Alarm Short*

Communication cable must be tested and verified during installation at each desired locations. All cables are test for open, short and color matching.

7 Setup and Operation

D. Turn-On the Ionizer

Once all systems in place, plugging Rj-45 terminal to ionizer and connect Model 5178D adapter to AC power line. LED display start and available to communication. Once ionizer powered, it's angle, output parameters and air pressure ranges may re-optimized to get best discharge performance. Model 5711R remote controller can adjust appropriate output parameters for each application.

E. Power

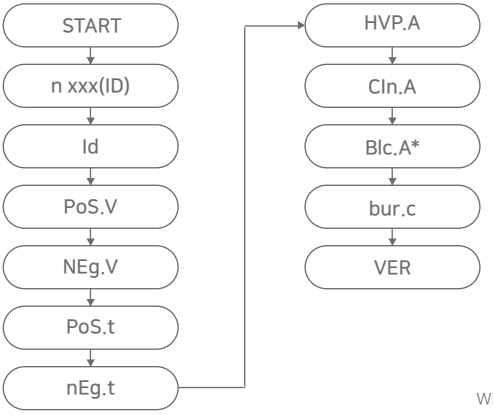
There is no power switch on the Model 7380d bar ionizer. Turn the ionzer on and off by connecting and removing the RJ-45 cable.

F. Output Settings

Once the ionizer is powered, it will activate and operate at the factory default mode. All ionizers should be adjusted and set to meet appropriate output parameters for each application due to different operating environments or needs within the specified area.

Following sections described functions and features of Model 7380d bar ionizer on LED display. User can select operation on/off, high voltage for both polarity by 10 volts resolution, cleaning alarm settings, power alarm setting and ID address.

7 Setup and Operation



Will be update later*

To start communicating with Model 7380d bar ionizer, press START and ID address on Model 5711R remote controller. Press FUN button for select output parameters. LED will display as above and all parameters can be adjustable by UP/DOWN. Once user changed any parameter, press FUN to store value in memory and make changed value operational.

1) Remote Controller

User can adjust parameters from remote controller.

START	Press START to adjust parameters
FUN	Press FUN to parameter modes and save value
NEXT	Press NEXT to move next parameter mode
UP	Press UP to increase selected parameter value
DOWN	Press DOWN to decrease selected parameter value
0-9	User selectable value input from 0 to 9 for voltage and time
END	Parameter adjustment finished, press END for exit.

*If user did not press FUN, adjusted value will not store and back to previous set value.

7 Setup and Operation

2) ID Address

Press FUN and press NEXT, UP/DOWN or press any number for set ID address on remote controller in three digits such as 001 or 010. LED will display as below. Press FUN to store this ID set.

3) Output On/Off

Press FUN and DOWN, output On/Off parameter will display.
On is factory default set for initial enable mode. Press UP/DOWN to change bar ionizer on or off. Press FUN to store this set.

4) Output Voltage Adjustment

Press FUN and DOWN (2 times). PoS.V will display and press NEXT, factory default set value will display. Press UP/Down or type numeric value up to 4.0 kV maximum. Press FUN to store this set value.

*Note: Do not exceeded more than 4.0 kV ouput. This will cause of reliability issue for long term use.

Press FUN and DOWN (3 times). NEg.V will display and press NEXT, factory default set value. Press UP/DOWN or type numeric value up to -4.0 kV maximum. Press FUN to store this set value.

*Note: Do not exceeded more than -4.0 kV ouput. This will cause of reliability issue for long term use.

5) Positive On and Off Time Adjustment

Press FUN and DOWN (4 times). PoS.t will display and press NEXT,
On will display. On is factory default set. Press UP/DOWN to change bar ionizer on or off. Press FUN to store this set.

6) Negative On and Off Time Adjustment

Press FUN and DOWN (5 times). NEg.t will display and press NEXT,
On will display. On is factory default set. Press UP/DOWN to change bar ionizer on or off. Press FUN to store this set.

7) High Voltage Power Failure Alarm on/off and Range Adjustment

Press FUN and UP (5 times). HVP.A will display and press NEXT,
off will display as factory default set value. Press UP/Down to change alarm on/off. Press FUN to store this set value.

If user changed HVP alarm mode to On, user need to define alarm range. Positive factory default set value is 20(%) automatically by firmware and user can define what voltage difference may trigger alarm.

Press UP/DOWN value on the Pos.A, neg.A will display and press NEXT to change preferred value set. Press UP/Down to change alarm on/off. Press FUN to store this set value.

7 Setup and Operation

8) Cleaning Frequency Alarm

Press FUN and press UP(4 times). Cln.A will display and press NEXT, oFF is factory default set value.

Press NEXT (2 times), user can adjust cleaning frequency from 1 day to 180 days option. Press UP/DOWN or type numeric value to set any cycle. Press FUN to store this set value.

7) Audio Alarm Setting

Press FUN and press UP (2 times). bur.C will display and press NEXT. Off is factory default set as disable cleaning cycle indication mode. Press UP/DOWN to adjust audio alarm option from off to on.

8) Firmware Version Display

Press FUN and press UP and press NEXT, VER will display.

7 Setup and Operation

8 Maintenance

Warning

There are no user-serviceable parts inside the controller or emitter. Any unauthorized service will void the warranty and may result in additional repair charge.

General Maintenance Information

Emitter point maintenance ensures continued performance of all type of ionizers. Dirt of erosion to emitter points can be caused by a number of environmental factors, including airborne molecular contamination issue.
Before cleaning or removing emitter points, all ionizers must be powered down by turn off the controller or change to off status on controller.

Step 1. Recommended Cleaning Materials:

1) Cleanroom-compatible cloth or wipe
2) Cleanroom approved swabs (foam is not recommended)
3) Cleaning solution of 50% isoproply alcohol (IPA) and 50% deionized water mixture

Caution

Do not clean emitter points while the unit is powered. Doing so may result in additional contamination and possible shock. After removing power from the emitter, allow few minutes for high voltage power supplies to discharge.

Step 2. Cleaning the Emitter Points

Turn off the ceiling emitter. Clean the emitter points and areas around the emitter points, moisten a cleanroom-compatible swab or cleaning cloth in the IPA solution, or use cleaning solution from Core Insight. Gently rotate the swab or cleaning cloth around the emitter point. After cleaning allow the emitter points for dry out about 20 minutes. Turn on the system.

Warranty and Service 9

Core Insight, Inc. provides a limited warranty for all ionizers. New products manufactured or sold by Core Insight, Inc. are guaranteed to be free from defects in material or workmanship for a period of defined schedules from the date of initial shipment. Core Insight, Inc.'s liability under its new product warranty is limited servicing (evaluating, repairing or replacement) any unit returned from customers that has not been subjected to misuse, neglect, lack of routine maintenance, repair, alteration or accident. In no event shall Core Insight, Inc. be liable for collateral or consequential damages.

To obtain service under this warranty, please contact sales representative at sales@coreinsight.co.kr or local contacts.

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