IONIZER USER MANUAL

Model 7110

AirStat® Digital Pulsed AC Bar Ionizer

Version 1.1

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 AC power adapter.

To prevent fire or shock hazard, do not expose the pulsed DC bar ionizer to excessive moisture. Do not use the equipment in an explosive environment. There is a possibility that small spark produced by poorly maintained ionizers could cause detonation.

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.

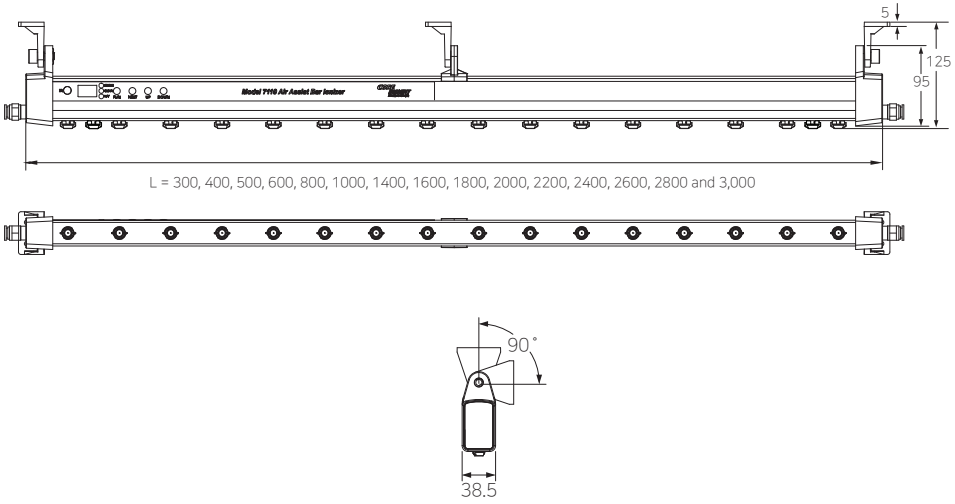
B. Personal Safety

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 VDC
Ion Emission	Pulsed AC Technology
Ion Balance	User Defined
Frequency	1 ~ 50 Hz
Emitter Point	Tungsten 99.99%
Display	3 Digit LED Display / 2 Color LED
Control	Frequency, Output Voltage and Duty Cycle Adjustment for each polarity by Remote Controller
Air Inlet	8mm diameter of air fitting
Alarm	Visual & Audio alarm operates for power failure and cleaning cycle schedule
Output Monitoring	Normal Open Relay based Output Signal
Material	Enclosure: ABS, Nozzle: Polycarbonate
Operating Environment	Temperature: 15~35℃ Humidity: 30~60% RH
Dimensions (mm)	95H x 39D x 300, 400, 500, 600, 800, 1000, 1400, 1600, 1800, 2000, 2200, 2400, 2600, 2800 and 3000L
Option	IR Remote Controller
Warranty	1 year limited warranty

Drawing 6



Setup and Operation 7

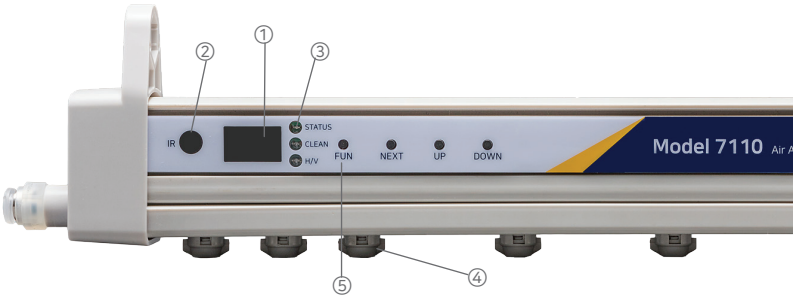
A. Introduction

Model 7110 AirStat® Digital Pulsed AC Bar Ionizer is designed to provide ionization in the semiconductor wafer process, flat panel display, pharmaceutical and other contamination control applications. Digital control system enables accurate adjustment of power output and feedback monitoring capability.

All output parameters can adjustable through Model 5711R IR Remote controller and provide relay based output monitoring to FMS interface.

7 Setup and Operation

B. Description of Model 7110 Pulsed DC Bar Ionizer



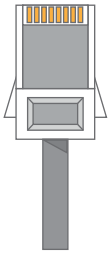
① LED: 3 digit display. Setting output parameter values and alarm level.
② IR Receiver: Communicate with Model 5711R remote controller.
③ LED: Indication for normal operation (Green) at ST, cleaning cycle (Yellow) at CL and high voltage power failure (Red) at HV for alarm status.
④ Emitter Nozzle: Nozzles are replaceable
⑤ 4 Keys: All parameter adjustment press by FUN + NEXT and change value by UP & DOWN.

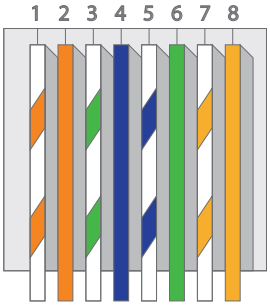
Model 5170D Power Adapter

Model 5711R Remote Controller

C. Installation

Determine the mounting locations of pulsed AC bar ionizer at the workstation or automated process equipment within 2 meters distance from Model 5170D DC power adapter. Install the bar appropriate height at the location with polycarbonate brackets and other methods. 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. The maximum daisy-chained cable length are 5 meters from the first bar with CAT-5 or better.





Link IN - Wiring Cable					
No.	Color Code	Description	No.	Color Code	Description
1	Orange/White	24V DC Input	5	Blue/White	HV Failure
2	Orange	24V DC Input	6	Green	Alarm COM
3	Green/White	Run/Stop	7	Brown/White	GND
4	Blue	Clean	8	Brown	GND

Communication cable must be tested and verified during installation at each desired locations. All cables are test for open, short and color matching. For daisy-chained wiring should be all straight connection from the first unit to the next.

7 Setup and Operation

D. Powering the System

Connect the pulsed AC bar ionizer and adapter at determined location, then the system will turning on by Model 5170D plugging a properly grounded AC power receptacle.

When pulsed AC bar ionizers are powered, LED display start and available to communication. Model 5711R remote controller can adjust appropriate output parameters for each application.

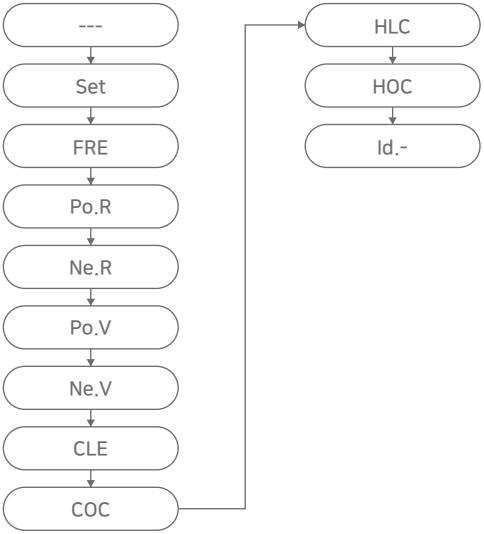
Cautions

Do not connect or disconnect emitter nozzle while the unit is powered!

E. Output Settings

Once pulsed AC bar ionizers are powered, it will operate at the factory default mode. All output parameters can be set differently to satisfy different operating environments or needs within the area.

Following sections described functions and features of pulsed AC bar ionizer on LED display. User can select factory preset recommended operational mode or programmable mode, frequency, duty cycle, high voltage output levels for both polarity by 0.1kV resolution, cleaning alarm settings, power alarm setting and ID address.



7 Setup and Operation

To start communicating at each plused AC bar ionizer, press START on Model 5711R remote controller. Press FUN button for select output parameters. LED will display as below 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.

Model 5711R
Remote Controller

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.

2) Preset Recommended Mode or Programmable Mode

Press FUN and Set will display. Then, immediately change display P1 which is programmable mode. Press UP/DOWN to change programmable mode to preset application mode. A1 is short distance up to 300mm, A2 is medium up to 600mm and A3 is long distance. Press FUN to store this set.

3) Frequency Adjustment

Press FUN and NEXT (1 time). FRE will display.

30 Hz is factory default set value. Press UP/Down or type numeric value up to 50 Hz maximum. Press FUN to store this set value.

4) Duty Ratio Adjustment

Press FUN and NEXT (2 times). Po.R will display.

99% is default set value. Press UP/Down or type numeric value down to 50% minimum. Press FUN to store this set value.

Press FUN and NEXT (3 times). Ne.R will display.

99% is default set value. Press UP/Down or type numeric value down to 50% minimum. Press FUN to store this set value. Different set value requires for each bar length.

5) High Voltage Output Adjustment

Press FUN and NEXT (4 times). Po.V will display.

Press UP/Down or type numeric value up to +7.0 kV for preferred output.

Press FUN to store this set value.

Press FUN and NEXT (5 times). Ne.V will display.

Press UP/Down or type numeric value up to -7.0 kV for preferred output.

Press FUN to store this set value. Different set value requires for each bar length.

7 Setup and Operation

6) Cleaning Alarm

Press FUN and NEXT (6 times). C.LC will display. C.LC is the current feedback circuit for low level and 100 is default set value. Press UP/Down to change suitable value for application. Press FUN to store this set value.

Press FUN and NEXT (7 times). C.OC will display. C.OC is the current feedback circuit for high level and 300 is default set value. Press UP/Down to change suitable value for application. Press FUN to store this set value.

7) High Voltage Power Alarm

Press FUN and NEXT (8 times). H.LC will display and immediately change default value. H.LC mode is high voltage low level current alarm adjustment. User can adjust low level. Default set value is 100.

Press NEXT and HO.C will display and immediately change default value. HO.C mode is high voltage high level current alarm adjustment. User can adjust high level. Factory default set value is 300.

8) ID Set and Change

If user wants to set ID address or change, press FUN and NEXT (10 times). Id- will display and immediately change to 0. Press UP/DOWN to adjust appropriate ID number. Press FUN to store.

8 Maintenance

Warning

There are no user-serviceable parts inside the pulsed AC bar ionizer. Any unauthorized service will void the warranty and may result in additional repair charge.

General Maintenance Information

Emitter point maintenance ensures continued performance of pulsed AC bar ionizer. 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, the pulsed AC bar ionizer must be powered down by unplugging of RJ-45 connector or change to off status.

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 ionizer, allow few minutes for high voltage power supplies to discharge.

Step 2. Cleaning the Emitter Points

Turn off the ionizer. 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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