# Specification

Ceiling Emitter Ionizer_001-5818

## 01 Product Picture


## 02 Safety Precautions

- Failure to follow these important safety warnings may result in damage to the digital ionization system components and void the system's warranty.
- Do not use in dangerous environment(such as flammable and explosive)
- Do not use in place with plenty of oil or water,high temperature and humidity,especially in places with condensation.
- Use correct input voltage to avoid damage this device.
- Make sure the controller power supply is turn off before connecting or disassemble the ceiling emitter or cables,otherwise this device may be damaged.
- Do not cut off the power supply of the ceiling emitter by removing the cable to avoid damage to the ceiling emitter.
- Do not clean the emitters of each ion bar during the power supply period of this device,which may cause additional pollution and may result in electric shock.
- Only the installation and maintenance procedures described in this manual are allowed for related operations to avoid personal injury or equipment damage.

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## 03 Product Overview

Indoor ionization system is a device designed to neutralize static electricity in a wide range of the indoor and outdoor areas of the clean room by ionizing the surrounding atmosphere through corona discharge.

- This digital ionization system can be used in clean room, and all of its components are compatible with the clean room.
- It adopts DC pulse/steady-state DC ionization technology.
- It is a device that neutralizes static electricity in a wide range of indoor and outdoor areas of the clean room by ionizing the surrounding atmosphere through corona discharge.
- The positive and negative voltages of each 5818 space rod can be adjusted independently to achieve better ion balance.
- Include standard configuration and optional configuration.

  a. Standard configuration:
  001-5818 ceiling emitters, 001-5800 controller/001-5800L controller, infrared remote control.

  b. Optional configuration:
  PC networking monitor software

- The 001-5800 controller can connect up to 20 sets of 001-5818 ceiling emitters to construct a small indoor ionization system, which can be monitored via PC software networking.
- The 001-5800L controller can connect up to 80 sets of 001-5818 ceiling emitters. When combined with multiple 001-5800 and 001-5800L controllers networked to PC software, it can be expanded into a large system with complete software monitoring capabilities.
- The ceiling emitter can be set through a handheld remote controller, which features excellent performance in any application and indoor airflow environment.
- The exclusive PC monitor software provides visual monitoring and management tools, including:

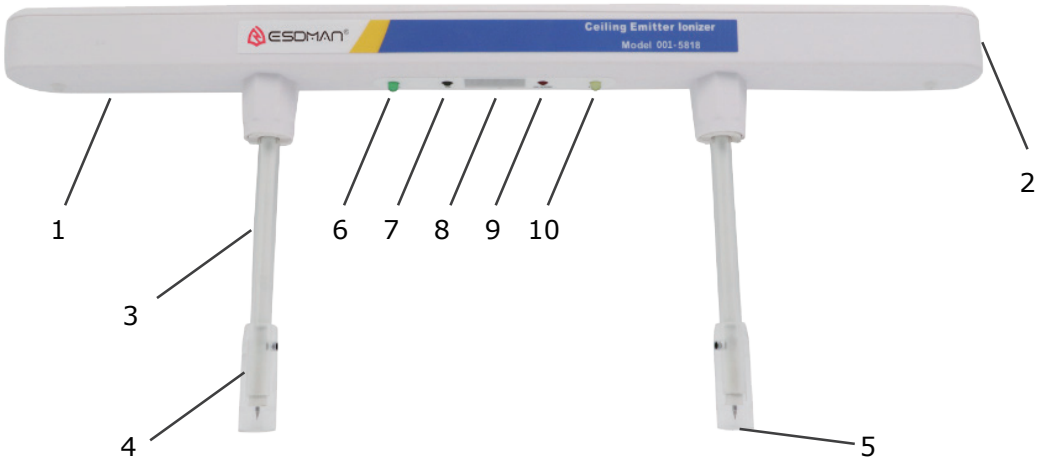
  a. Software adjustments include: on/off cycling of positive and negative ion output, power adjustment for ion output, setting cleaning cycle reminders, standby mode/pulse mode/DC mode, and automatic notification settings for alarm status and maintenance alerts. Notifications can be sent to multiple individuals via email, SMS, or mobile phone.

  b. Different numbered ion generators are positioned and operate with system status logging storage; safety levels can be set, allowing only authorized users to access.

## 04 Product Introduction

**Ceiling Emitter Model 001-5818**

- The 001-5818 ceiling emitter employs microprocessor technology for bidirectional communication and adjustment functions between the 001-5800/001-5800L controllers and computer software. The 001-5818 ceiling emitter is suspended above areas in cleanrooms where static elimination is necessary, without interfering with laminar flow, performing better than the requirements of ISO Class 1 (significantly higher cleanliness than the Fed Std 209(e) standard).
- The 001-5818 ceiling emitter is powered and communicates via the 001-5800/001-5800L controllers. It can connect and communicate network-wise with multiple 001-5800/001-5800L controllers via computer monitoring software, and monitor multiple 001-5818 ceiling emitters. Parameters of the 001-5818 ceiling emitters can be finely adjusted via infrared remote control to achieve precise control and monitoring of the ion output.
- Each startup of the 001-5818 ceiling emitter displays the program version number, such as U 2.09. After skipping the program version number, it defaults to display the serial number, such as 001. If modifications are made, use the remote control to turn off and restart the 001-5818 ceiling emitter (if adjustments are made via software, put the adjusted ceiling emitter into standby mode and then restart), to default display the body number.




1. Ceiling emitter
2. Power and communication port:used for power supply and communication,1 set at each terminal
3. Discharge bar,which can be replaced
4. Emitter guard,can be disassembled
5. Emitter material :tungsten alloys, titanium alloys, monocrystalline silicon etc
6. Negative ion LED light:green light on when emitting negative ions.

7. Infrared remote receiver: get remote signal

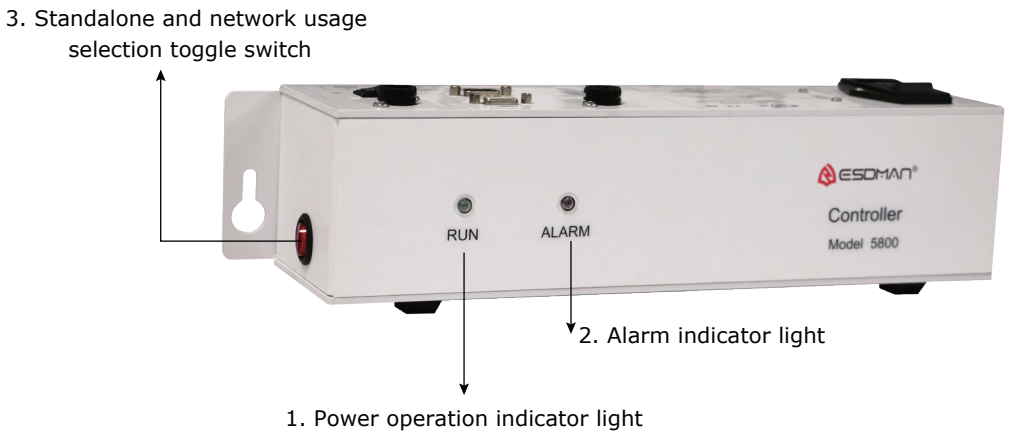
8. LED display: Displays operational parameters when adjusted. After shutdown and reboot, it defaults to display only the body number.

9. Alarm:red light on when abnormal

10. Positive ion LED light:yellow light on when emitting positive ions.

**Controller Model 001-5800**

- The 001-5800 controller powers and communicates with the 001-5818 ceiling emitters and connects to software for communication. After connecting to the software, the 001-5800 Controller can "talk" to the 001-5818 ceiling emitters via computer software or handheld terminal tablets, enabling precise and detailed monitoring of each 001-5818 ceiling emitter's status on the software interface. The 001-5800 controller can power and communicate with 20 sets of 001-5818 ceiling emitters; the 001-5800L controller can power and communicate with 80 sets; input voltage is wide range: AC100-240V.
- The 001-5800 controller has a toggle switch on its side, which can be set for either network mode or standalone mode.
- When the switch is on, it is in network mode, allowing for network operations via computer software or handheld terminals. If the ceiling emitters triggers an alarm, a red alarm indicator will appear on the software interface. A RS232 alarm signal must be output from the computer to the controller, with the controller outputting 4-20mA or a relay closure (default output is a relay closure circuit), and the distance between the computer and the controller should be controlled within 15 meters.
- When the switch is off, it is in standalone mode, which does not require connection to computer software or handheld terminal tablets. In standalone mode, the controller judges the status of the ceiling emitter; if the ceiling emitter triggers an abnormal alarm, the controller outputs 4-20mA or a relay closure (default output is a relay closure circuit).

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4.Interface and switch: Input voltage 110V / 220V, verify the power voltage before connecting the power cord. Fuse holder: fuse type 5 x 20 mm, 250V slow-blow fuse, rated current 2A.

5.110V / 220V selection switch should slide to select the voltage before connecting the power cord.

6.J1 port: Each interface can connect up to 20 sets of 001-5818 ceiling emitters.

7.J3 signal alarm port: Provides a closed alarm signal in alarm state (pin 2 positive, pin 3 negative).

8.Alarm output switch: Can be turned off during debugging stages, cutting off any alarm signals triggered during this period from being sent to the facility system.

9.J3 and J4: Two RS-485 communication ports, allowing connection of a 001-5800/001-5800L to a computer, or serial connection of multiple controllers to a main computer.

10.RS485 interface (reserved)

11.RS232 interface (reserved)

12.Fuse, 250V 2A, blows in case of a short circuit in the ceiling emitters.

**Infrared Remote Control**

- The infrared remote control adjusts the operational parameters of the 001-5818 ceiling emitters. It features multiple buttons for turning on/off (power/standby), switching between pulse mode and DC mode, single positive and negative ion output, adjusting the output levels and stop cycles, and ion output power. After adjustments are made with the infrared remote control, press the lock button to save the settings. Aim the remote control directly beneath the 001-5818 ceiling emitters at the black infrared receiver to adjust parameters.

- For further details, please refer to the operation manual.


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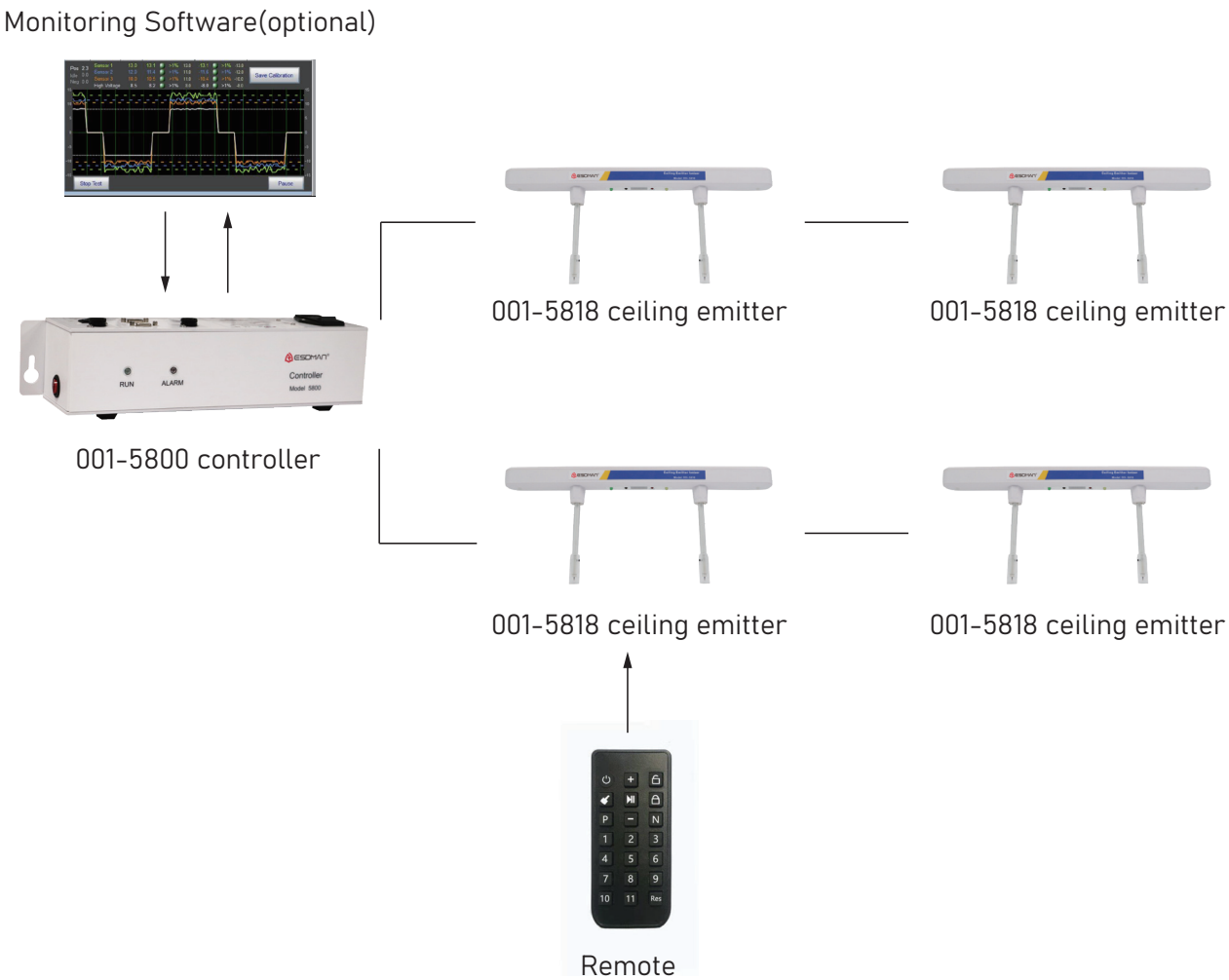
## 05 Installation

**Security Information:**

Please read below safety information carefully before installation or operating any part of the digital ionization system:

- First, check the 110V / 220V outlet at the installation position is properly grounded and the ground wire has no leakage
- Verify the input voltage at the fuse holder site before powering the device
- Verify the controller's power is off before connecting or take away the ceiling emitter or any other part.
- Do not disconnect the device's power by switching off the power cable to avoid product damage.
- Do not clean the ceiling emitter while the device is in power supply. Doing so can lead to additional contamination and possible electrocuting
- Perform related operations only according to the installation and maintenance steps described in this manual to avoid personal injury or equipment damage

**Installation Guide:**



**Cables:**

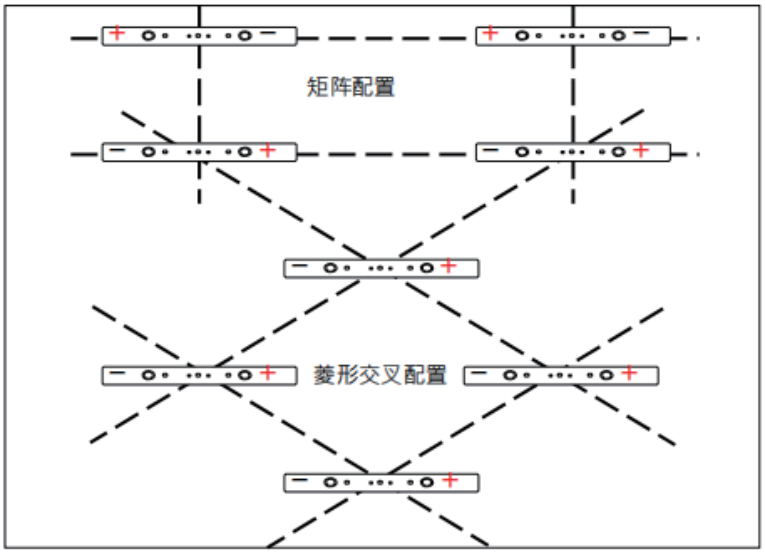
- Please use phone line(24-26 AWG RJ 11 4p4c cable)for 001-5818 ceiling emitter.
- In the ideal situation, the number and location of each 001-5818 ceiling emitter should be determined, please set the body number of the ceiling emitter first, confirm the installation position of the ceiling emitters by number, then install the 001-5800/001-5800L controller and lay the wiring .
- The total length between each cable (24-26 AWG RJ 11 4p4c) connecting 001-5818 ceiling emitter in series and the 001-5800/001-5800L controller shall not exceed 45M.

**Ceiling emitter installation and configuration:**

To achieve the best configuration for the room

- The emitters of the same polarity should not be adjacent, and the positive emitters have a red mark on the body, and should be cross-mounted with positive and negative polarity.
- Suggest all emitters and metal objects keep distance above 60cm,the ion bar close to wall at least keep distance 60cm with the wall,to prevent the wall from absorbing positive and negative ions.
- Ceiling emitter are best installed under or at the edge of the HEPA/ULPA.
- The installation distance is 1.8M for ceiling emitter,recommended distance is 1.2M to 2.4M,or according to the engineer's field investigation to determine the installation distance, in the crowded aisle should use a compact installation, can be densely installed.
- The length of the ceiling emitter is selected based on: the range from the emitter to the electrostatic elimination target is 1M to 1.5M.

Ceiling emitter configuration example

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**Install 001-5818 ceiling emitter:**

- The ceiling emitter has been removed during shipment to facilitate transportation. Insert the plug of the ceiling emitter into the body of the emitter and turn it clockwise 1/4 turn to tighten.
- If necessary, remove the ceiling emitter from the body. Remove the ceiling emitter by turning it 90 degrees counterclockwise.
- Emitter Installation:If emitter is not connected to ceiling emitter,please install it as per daily maintenance.
- Stainless steel mounting plates and screws and nuts are provided with the shipment. Install one plate at each end of each ceiling emitter, securing it within an aluminum channel.
- Or use four pieces of 3M Velcro, connecting two to one ion emitter.
  When using the velcro firmware, please follow below steps
  a. Clean the surface with alcohol (50-75% concentration)
  b. Attach Velcro to both sides above the ion emitter, then attach the emitter with Velcro to the ceiling. After pasting, press firmly at least 20 seconds to ensure bond strength.
  Since the adhesive strength of the double-sided tape of the Velcro will fall off once it is reduced, do not reuse it.

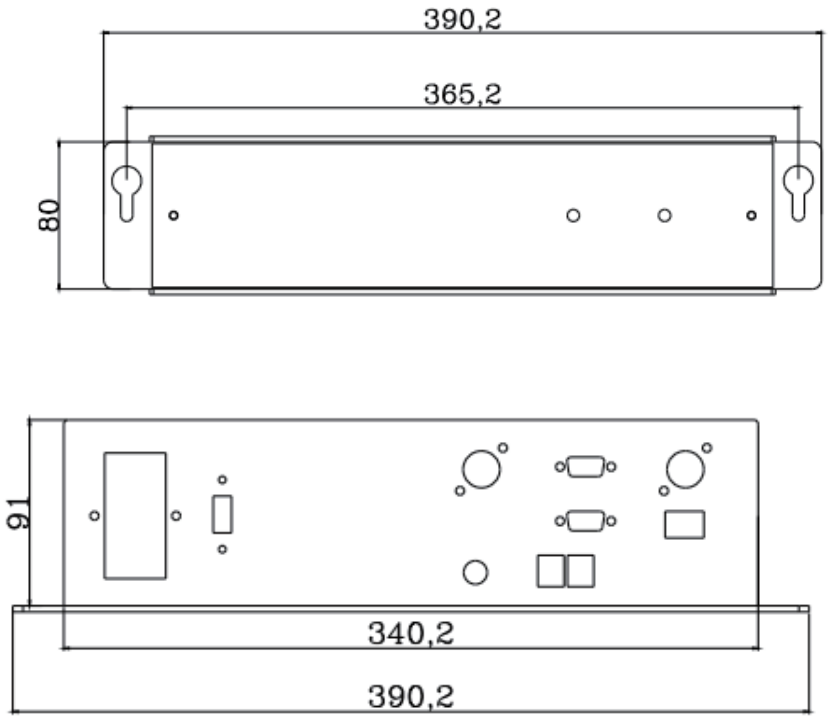
**Controller Installation:**

**Request for important cables:**

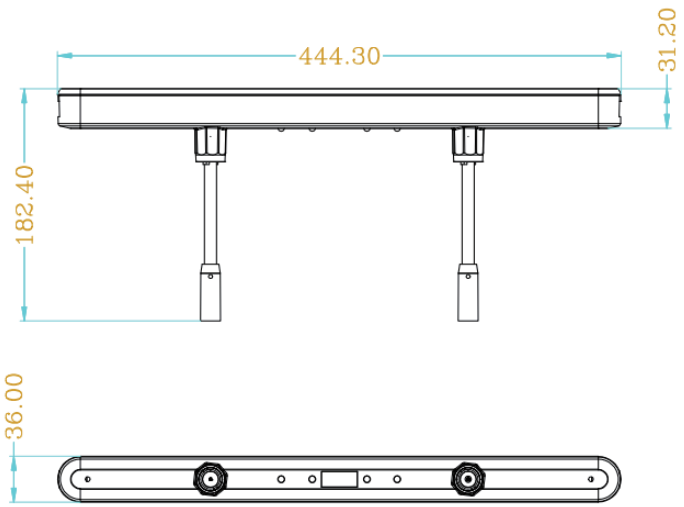
- 3 pin power adapter should be used and the grounding pin is needed.
- The length of 3 pin power adapter should be 2M for the controller.
- Check that the AC input voltage is AC110V or AC220V, and ensure that it is consistent with the voltage selection switch next to the power socket.
- Please make sure the controller’s power is off before connecting or disconnect the cables between ceiling emitter and controller.
- Do not directly insert and remove the cable of the ceiling emitter, which may cause equipment failure. Turn off the controller power.
- To prevent personal safety and equipment damage, please follow the steps described in this manual.
- The 001-5800/001-5800L controller has mounting holes on both sides; use screws and nuts to securely install the controller or place it on a desktop. The installation system of the controller should be able to withstand four times the weight of the controller.
- Connect the 001-5818 ceiling emitter after mounting the controller to finish this system connection.

## 06 External Dimension

### 001-5800 Controller




### 001-5818 Ceiling Emitter

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## 07 Operation

**Set ceiling emitter equipment number**

- The default equipment number of all ceiling emitter is 000, please set the number first, and then install and power on,To set the body number, modify it via the software interface. Generally, numbers are assigned during factory testing and labels with these numbers are affixed to the body of the ion emitters.

**Operation mode selection(pulse/DC/standby)**

- Confirm operating mode according to environment, factory set to pulse mode to suitable for remote areas.
- DC mode is suggested when there are short distance(<1M)and stronger airflow(>0.5m/sec)and want to reduce ion balance up and down equilibrium swing

**Operating mode setting(pulse/DC/standby)**

- The factory default is pulse mode.
- 1. Pulse mode:positive and negative ions produced alternately,this mode is recommended when in remote distance
- 2. DC mode:positive and negative ions produced simultaneously,this mode is recommended when in short distance
- 3. Standby mode: Press the power off button on the remote control, the 001-5818 indicator light and screen will turn off, entering standby mode. Use this mode when production stops (during maintenance, the power cord of the 001-5800/001-5800L controller should be unplugged).

**Mode selection**

3 modes can be selected:pulse mode/DC mode/standby mode

- Pulse mode: Press the number 8 key on the infrared remote control to activate pulse mode; the 001-5818 ceiling emitter's digital tube will display 01. Press the confirm button ⏯ to save data. Positive and negative ions alternate, and the yellow-green lights representing the polarity will alternate as well. This mode is recommended for long-distance use.
- DC mode: Press the number 9 key on the infrared remote control to activate DC mode; the 001-5818 ceiling emitter's digital tube will display 02. Press the confirm button ⏯ to save data. Positive and negative ions are generated simultaneously, and the yellow-green lights representing the polarity will light up at the same time. This mode is recommended for use within a distance of 1 meter.
- Standby Mode: ⏻ During normal operation, press the power switch on the remote control to turn off the 001-5818 ceiling emitter and enter standby mode.

⏯ Confirm button:

After modifying any parameter, you must press the confirm button to save the modification before the modified parameter task is executed.

P Button:

Only produce positive ions:

In pulse mode, press this button to achieve unipolar positive ion output, then the yellow light on and only output positive ions, then press the confirm button to exit the setting mode

N Button:

Only produce negative ions:in pulse mode,press this button to achieve unipolar negative ion output, then the green light on and only output negative ions, then press the confirm button to exit the setting mode

\+ Increment button:add parameter

− Decrement button:reduce parameter

**How to use the infrared remote control**

1 Button Positive ion output cycle setting:

In pulse mode, place the infrared remote control directly beneath the 001-5818 ceiling emitter, aiming at the black infrared receiver. Press the button to enter the positive ion output cycle setting mode, for instance, displaying E 3.0 for 3 seconds. Then press the + - buttons to increase or decrease the positive ion output cycle. Press the save button to save the settings after adjustment.

2 Button Positive ion stop time setting:

In pulse mode, press the button to enter the positive ion output stop cycle setting mode, for instance, displaying F 1.0 for 1 second. Then press the + - buttons to increase or decrease the positive ion output stop cycle. Press the save button to save the settings after adjustment.

3 Button Negative ion output cycle setting:

In pulse mode, press the button to enter the negative ion output cycle setting mode, for instance, displaying R 3.0 for 3 seconds. Then press the + - buttons to increase or decrease the negative ion output cycle. Press the save button to save the settings after adjustment.

4 Button Negative ion stop time setting:

In pulse mode, press the button to enter the negative ion output stop cycle setting mode, for instance, displaying C 1.0 for 1 second. Then press the + - buttons to increase or decrease the negative ion output stop cycle. Press the save button to save the settings after adjustment.

5 Button Positive ion output power setting:

Press the button to enter the positive ion output power setting mode, for instance, displaying H050, representing an output power of 50%. Then press the + - buttons to increase or decrease the positive ion output power. After adjustments, press the confirm button to save the data.

6 Button Negative ion output power setting:

Press the button to enter the negative ion output power setting mode. Then press the + - buttons to increase or decrease the negative ion output power. After adjustments, press the confirm button to save the data.

Cleaning cycle setting:

Cleaning cycle setting: Default is 0, please set uniformly via the software interface.

Res Restore factory setting:

Press this button can restore default factory setting,factory setting parameter:positive ions output period is 3 sec,stop period is 1 sec,negative ions output period is 3 sec,stop period is 1 sec,the positive ion output power is 50%, the negative ion output power is 50%, and the full power is 100%. It is recommended to clean the emitter when the maximum power is adjusted to 85%

**PC monitor software**

Please consult our staff

## 09 System Options

- Multiple ceiling emitter length can be selected to suitable for areas of different heights:available length is 6.5、13、26、38 、62、91、152、168 cm,length can be custom made upon request.
- Emitter material:tungsten alloy,titanium metal,monocrystalline silicon non-metallic.
- Installation metal components brackets can be custom made.
- Please contact our ESDMAN sales team to know more details about software.

## 10 Daily Maintenance

Regular maintenance work is required, which can be provided by experienced maintenance personnel

- Clean every 2 or 12 months
- Ion balance calibration every 6 or 12 months
- Installation/repositioning work and distribution

**Clean the emitter:**

- There will be dust and other contaminant at the front and around the emitter after long time usage.
- Clean the emitter every 2 or 6 months,wipe the emitter tip 2-3 circles with cotton swab dipped in industrial alcohol
- Be sure to turn off the power and unplug the power cord of the 001-5800/001-5800L controller before cleaning.

**Cleaning method**:

- Wipe the needle tip of the electric needle 2-3 times with a cotton swab dipped in industrial alcohol

**Replace emitter:**

- Suggest replace the emitter every 2 or 3 years,or replace the emitter if it is damaged or worn.
- Before replacement, make sure to turn off the power, unplug the power cord, and wait five minutes for the high voltage power supply to discharge. Then proceed with the cleaning. Use pliers or plastic tweezers to remove the discharge needle. After removing the discharge needle, wipe the needle seat with a cotton swab dipped in alcohol.
- Then gently insert the new discharge needle into the needle holder using pliers to complete the installation.

Notice:The discharge performance will be affected after the emitter is contaminated,so it should be cleaned regularly and timely.The emitter front end is sharp,please be careful not to scratch fingers.

**Controller maintenance:**

- Replace fuse
- Notice:please make sure that the controller power cable has been disconnected from the controller before replacing fuse.
- Fuse size: 2A 250V/ 5 x 120mm

**Remote maintenance:**

- If the remote doesn’t response,please replace battery or purchase new remote.

**001-5818 ceiling emitter shell clean:**

- Only diluted IPA solution is allowed to clean the shell, and do not use any cleaning agents or solvents that may damage the surface finish of the powder coating on the controller.
- When cleaning any shell, an IPA solution should be used to moisten a clean room compatible wipe. Clean the entire shell from one end. Thoroughly wipe all areas clean. Regularly replace the wipe to ensure that the dirt can be completely removed from the shell

## 11 Discharge performance and balance calibration

**Equipment:**

- ME288B charge plate monitor
- Tripod shelf(optional)
- Anemometer

**CPM Test Method:**

- Use CPM equipment and tripod bracket to start test
- Allow the CPM to pre start at least 15 minutes, let the emitter at a distance of 1.2M or more from the CPM equipment.
- Use anemometer to measure the air flow at the height of CPM. Record the airflow and CPM measurements obtained from the sample location
- The difference in airflow can have a significant impact on the decay time. To achieve optimal effective ionization, it is recommended to have an airflow speed of 70-90 FPM (0.35-0.45 m/s) to avoid personnel moving in the testing area as much as possible. Personnel approaching the testing area will interfere with airflow and ion movement,test results will be affected . Using automatic testing mode, the automatic testing will conduct a positive and negative decay time test, followed by a balance test

**Record CPM test result:**

- Positive and negative peak voltage
- Ion balance(the average of positive and negative peak voltage)
- Positive and negative decay time
- Positive and negative decay time(1K →100v)<60 sec
- Ion balance Vp-p= 50～150v

**Ion balance modification method:**

- Extend ion opening time will increase the ion balance peak
- Short ion opening time will reduce the ion balance peak
- Adjust ion balance, please change the proportion of positive or negative output power/adjust the opening and closing time of positive or negative ion output

**Slow decay time**:

a. Pulse mode:

- If the balance voltage swing is<150 V, the+/ - opening time can be increased by 0.1 second increments until the balance voltage swing is close to and<150 V, the adjustment is stopped and the parameters are saved
- If the balance voltage swing is < 150 V,the +/- output power can be increased by 1% increments until the balance voltage swing is close to and <150V,the adjustment is stopped and the parameters are saved.
- If the balance voltage swing > 150V,the +/- close time can be reduced by 0.1 second increments until the balance voltage swing is close to and<150 V,the Adjustment is stopped and the parameters are saved.
- If the balance voltage swing > 150V,the +/- output power can be reduced by 1% increment until the balance voltage swing is close to and < 150V,the adjustment is stopped and the parameters are saved.

b. DC mode:

- Increasing the output power of positive and negative ions can accelerate the decay speed, and it should be noted that the peak swing of balance should be within 150V

**If the ion balance voltage swing is larger(only suitable for pulse mode)**

- Reduce the positive and negative power output by 1% increments and maintain balance until the swing is<150 V or within the required range
- Reduce the+/ - opening time by 0.1 seconds increments and maintain balance until the swing is<150V or within the required range

**If the airflow is low and cannot change the airflow environment, ways to accelerate the speed of static electricity elimination**:

a. Pulse mode:

- Increase the voltage output power by 1% increments and maintain balance until the ion balance swing gets to 100-150V. Do not exceed 85% output. If the decay time is still too long, move to the next step
- Increase the +/- opening time by 0.1 seconds and maintain the balance until the decay time improves or the voltage swing close to<150V or within a reasonable range.

b. DC mode:

- Increase the voltage output power in 1% increments and maintain the balance until the output get to 85%.
- If the decay time is still too long, switch to pulse DC mode and perform balance adjustment

**Understanding of ionization mode, voltage swing and output, and decay time:**

a. Ionization mode:

- All 001-5818 ceiling emitter are set to pulse mode, allowing them to effectively output ions and provide fast decay time over the entire long distance between the ceiling and the working surface
- Ionization modules should be avoided from being installed near grounded metal equipment (at a distance of less than 12 inches (30cm)) to prevent their adsorption and consumption of ion output.When the working distance is<12 inches (30cm), DC mode can be used.

b. Voltage swing and output:

- Voltage swing means the range between positive and negative peak readings during CPM testing
- It is recommended to use a typical 50-80% output setting for the ionization module.
- For pulse DC mode, use CPM measurement to adjust the positive and negative output voltages to ensure that the maximum swing amplitude is maintained within the respective range of 150V, making the average value as close to zero as possible. The oscillation amount in any direction should not exceed 150 V. If possible, the voltage swing should be maintained below 100 V to meet the required decay time
- For steady-state DC mode, each positive and negative output should be adjusted to ensure that the combination of positive and negative settings is as close to zero as possible and<± 30 V

**Decay time:**

- The decay time is used to measure the time (in seconds) required for static charges to dissipate from+1000 V to+100 V and from -1000 V to -100 V. The conductive plate on the CPM is voltage applied to the initial voltage for 1000 V, and then dissipated to 10% of the initial voltage by the ceiling emitter, and the time required for positive and negative polarity is saved.

## 12 Specification

| | |
|---|---|
| Model | 001-5818 |
| Input voltage | 24VAC |
| Set mode | Infrared remote,monitoring software |
| Output ion HV | 0～20KVDC±10% Adjustable output ratio and cycle |
| Output current | <15uA, Limiting current to avoid electric shock hazard |
| Interface | Each ceiling emitter both sides has RJ-11 port |
| Regulation | Unified control of positive and negative ions output ratio to achieve stable ion balance |
| Control | Capable of controlling positive and negative output power or producing only a single positive or negative ion |
| Pulse DC state | Set precise timing at 0.1 second adjustment level, with two LED lights indicating positive and negative polarity |
| DC state | Positive and negative ions output simultaneously,with two LED lights indicating positive and negative polarity |
| Operating mode | Pulse DC mode/normal DC mode/standby mode |
| Emitter material | Tungsten alloy, titanium alloy, monocrystalline silicon, emitter is replaceable, with a life cycle related to the environment, approximately 2-3 years |
| Alarm | LED(red):Red light on when ceiling emitter HV abnormal |
| Maintenance | Calibrated every 3-12 months(according to environment) |
| Ozone | Under 0.005ppm |
| EMI | Below background level |
| Mounting method | Comes with 3M velcro |
| Operation environment | Temperature: 18-27°C  Humidity: 40-60% (non condensing) |
| Size | 3.1H*3.6W*44.5L<br>Ceiling emitter length:6.5cm,13cm,26cm,38cm,62cm,91cm,152cm,168cm |
| Weight | 0.425 kg |
| Warranty | 1 year |

| | |
|---|---|
| Controller model | 001-5800 |
| Input voltage | 100-240VAC |
| Output voltage | 24VAC |
| Connnection | 001-5800 connects to 001-5818 ceiling emitter; 001-5800 via RS485 connects to computer software or handheld terminals |
| Device monitoring interface | Alarm output port; during an alarm, it can output a relay closure signal (default) or a 4-20mA loop |
| System capability | 001-5800 can control 20 ea 001-5818 ceiling emitter |
| Size | 9.1H*8W*39.2L cm; installation spacing 36.5 cm. |
| Weight | 2.5kg |
| Warranty | 1 year |

## 13 Abnormality Alarm

- The 001-5818 ceiling emitter features high-voltage detection; in standalone use, if the high-voltage pack is damaged or ion emission is abnormal, the red ALARM indicator light will illuminate, triggering the alarm mode. An alarm signal will be sent to the 001-5800/001-5800L controller, the red light on the controller panel will light up, and the controller's alarm output will output a relay closure circuit.
- In networked use, if the high-voltage pack is damaged or ion emission is abnormal, the alarm signal will be transmitted to the computer, and the ceiling emitter icon within the computer monitoring software will light up red for error notification. The computer software connects to a dual-color alarm light: green when normal, red when abnormal.

## 14 Troubleshooting

- Except communication abnormal,ion transmit self detection abnormal,please check below chart when the following faults or abnormalities occur

| | |
|---|---|
| 001-5800 controller doesn’t power on | Check power plug and fuse |
| Abnormal operation of red light alarm | Contact with the supplier |
| Emitter contamination | Follow the part of cleaning emitter |
| Low discharge performance | Please refer to the instructions to adjust the opening and closing time of positive and negative ions or increase the output power of positive and negative ions |

## 15 Warranty

ESDMAN products have passed strict factory inspection.In case of failure,please contact our ESDMAN team for support.

**Warranty**

- 12 months from the date when products arrived at the buyer’s place.

**Coverage**

- This product is inspected by ESDMAN QC team,when it is in normal use within the warranty period,if it is damaged or fails due to poor design and manufacturing,free maintenance could be provided.
- ESDMAN team can provide limited warranty for all components of the digital room system:001-5818 ceiling emitter,001-5800/001-5800L controller,infrared remote

**Out of coverage**

- Consumables：(for example but not limited to emitters,ceiling emitter needle,ceiling emitter cable, battery,fuse or lamp)belongs to the loss part and are not covered by warranty.
- Damage,breakage or failure due to abnormal use
- Failure caused by modification or disassemble of maintenance from ESDMAN
- Failure caused by fire,natural disaster,flood,earthquake and other natural irresistible factors.
- Failure caused by abnormal voltage etc external factors.

## 16 Package Include

| | |
|---|---|
| 001-5818 ceiling emitter | 1 ea(according to customer's order to match suitable qty) |
| Hanging rod needle (length to be determined by the customer) | Two pieces (discharge needle materials available: silicon, tungsten, titanium) |
| Factory Test Report | 1 ea |
| User Manual | 1 ea |
| 3M Velcro/stainless steel mounting brackets | Four pieces/two pieces |

| | |
|---|---|
| 001-5800/001-5800L controller | 1 ea(according to customer's order to match suitable qty) |
| AC power cable(1.8m) | 1 ea |
| Infrared remote | 2 ea |

## 17 Optional Accessories

| | |
|---|---|
| Controller software | ea |
| Tungsten emitter | ea |
| Titanium emitter | ea |
| Monocrystalline silicon emitter | ea |

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