

Bench Top Ioniser Installation, Operation and Maintenance



Made in the
United States of America



Figure 1. Charleswater [92290](#) Bench Top Ioniser, 220VAC

Description

The Charleswater Bench Top Ioniser is a compact and lightweight steady state DC auto-balancing bench top working surface ioniser with integrated closed-loop feedback. The unit is normally placed at one end of the workbench or area to be neutralized. It may also be mounted to a wall or shelf. The ioniser's neutralization discharge time will be best approximately 30 cm to 120 cm directly in front of the unit and will increase as the distance from the unit increases.

The Charleswater Bench Top Ioniser employs Steady State DC Technology. Steady State DC systems consist of separate negative and positive ion emitters connected by a pair of high-voltage cables to their respective high-voltage power supplies. The spacing between emitters varies depending on the design, and DC power is constantly applied to the emitter points. The ioniser utilizes feedback from the internal sensor grill to continuously adjust the output to maintain balance.

"Ionizers should be considered as a method for charge neutralization in cases where grounding cannot be achieved." "Air ionization can neutralise the static charge on insulated and isolated objects by producing separate charges in the molecules of the gases of the surrounding air. When a static charge is present on objects in the work environment, it will be neutralized by attracting opposite polarity charges from the ionized air." "Note that ionization systems should not be used as a primary means of charge control on conductors or people." (EN 61340-5-2 paragraph 5.2.9)

"As with all ionizers, periodic maintenance will be needed to provide optimum performance." "The following list

contains important points for the selection process:- charge neutralization; - discharge time; - ion balance; - product sensitivity; - solution to static problem; - environmental considerations, - airflow; - physical dimensions." (EN 61340-5-2 paragraph 5.2.9.2)

Packaging

- 1 Bench Top Ioniser
- 1 Emitter Point Cleaner Pack
- 1 Certificate of Calibration

Power cords are not included and must be purchased separately.

[93000](#) - Power Cord, Europe

[93010](#) - Power Cord, United Kingdom

Installation

Place the unit at a desired location where that the airflow will not be restricted. Be sure that the ON/OFF switch located on the rear of the unit is in the OFF position. Plug the power cord into the unit and then into the appropriate AC power source.

Operation

1. Set the fan speed switch on the rear of the unit to the Low, Medium, or High position. Higher airflow will result in faster neutralisation rates.
2. Position the ioniser so that maximum airflow is directed towards the items or area to be neutralised.
3. Turn the unit ON. When the unit is first turned on, it conducts a self-test. The audible alarm will sound and the LED will cycle through the colors red, yellow and green. The LED will remain green during normal operation.

Maintenance

"All ionization devices will require periodic maintenance for proper operation. Maintenance intervals for ionisers 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 ioniser service. Routine service is typically required to meet quality audit requirements." (ESD Handbook TR20.20 section 5.3.6.7 Maintenance / Cleaning)

EIA-625, recommends checking ionisers every 6 months, but this may not be suitable for many programs particularly since an out-of-balance may exist for months before it is checked again. ANSI/ESD S20.20 section 6.1.3.1 Compliance Verification Plan Requirement states: "Test equipment shall be selected to make measurements of appropriate properties of the technical requirements that are incorporated into the ESD program plan."

CLEANING THE EMITTER POINTS

The maintenance interval of the Bench Top Ioniser is extended with the use of its auto-balancing closed-loop feedback technology. The ioniser will detect any shifts in the offset voltage (balance) and adjust its output to compensate for the change. This shift in offset voltage (balance) is often caused by particle build-up on the ioniser's emitter points. To maintain optimum neutralisation efficiency and operation, cleaning should be performed on a regular basis.

Use the included Emitter Point Cleaners or a swab dampened with Isopropyl alcohol to clean the ioniser's emitter points.

1. Turn the unit OFF and unplug the power cord.
2. Open the rear screen by loosening the screw and swinging the grill to one side.
3. Clean the emitter points using the included Emitter Point Cleaners or a swab dampened with Isopropyl alcohol.
4. Reattach the rear screen.
5. Plug in the power cord and turn the unit ON.
6. Verify the performance of the ioniser by using a charged plate monitor, or ionization test kit.



The emitter points should not require replacement during the life of the unit with normal handling. If necessary, item [50668](#) Replacement Emitter Points are available for order.

Adjustments and Compliance Verification

BALANCE OFFSET VOLTAGE ADJUSTMENT

The Bench Top Ioniser is an auto-balancing unit. However, tuning or manual adjustment can be accomplished by inserting a small screwdriver or trimmer adjustment tool into the balance adjustment hole located at the back of the unit. To increase the output in a positive direction, turn the potentiometer clockwise. To increase the output in a negative direction, turn the potentiometer counter-clockwise.

MAINTENANCE / ALARMS

In the event of circuit failure, the unit will enter shutdown mode.

When the unit enters shutdown mode, ionisation will be stopped, the LED on the front of the unit will illuminate a constant red, and the audible alarm will continuously sound. The user must then reset the unit by turning it OFF and back ON.

WARNING - RISK OF ELECTRIC SHOCK

THESE SERVICING INSTRUCTIONS ARE FOR USE BY QUALIFIED PERSONNEL ONLY. DO NOT PERFORM ANY SERVICING OF INTERNAL PARTS UNLESS YOU ARE QUALIFIED TO DO SO.

NOTE: The AC power cord MUST always be disconnected before the unit is disassembled.

The input voltage may be verified or reset by removing the 3 screws located on the back of the unit then removing the back case.

The input voltage can be selected using the two internal jumpers shown in Figures 2 and 3.

If the supply voltage drops from 110 Volts to below 85 Volts or from 200 Volts to below 170 Volts, the unit will shut down, the audible alarm will beep and the LED will blink red. The unit will automatically reset when the minimum voltage is restored.

Compliance Verification should be per ESD TR53. Offset voltage (balance) and both polarity's discharge time should be checked on every ioniser periodically using an Ionisation Test Kit or a Charged Plate Analyser. Measure offset voltage (balance) and both polarity's discharge times. Clean the emitter points (with electrical power off), adjust offset voltage (balance) to zero and then re-test for offset voltage (balance) and discharge times recording the measurements.

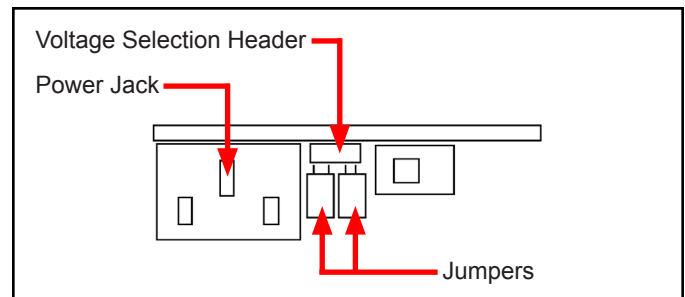


Figure 2. 110V jumper setting

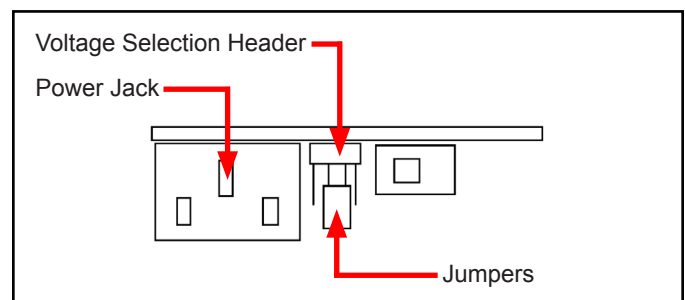


Figure 3. 220V jumper setting

Neutralisation (Discharge) Times

All data was taken with the fan speed set to high. All time measurements are in seconds.

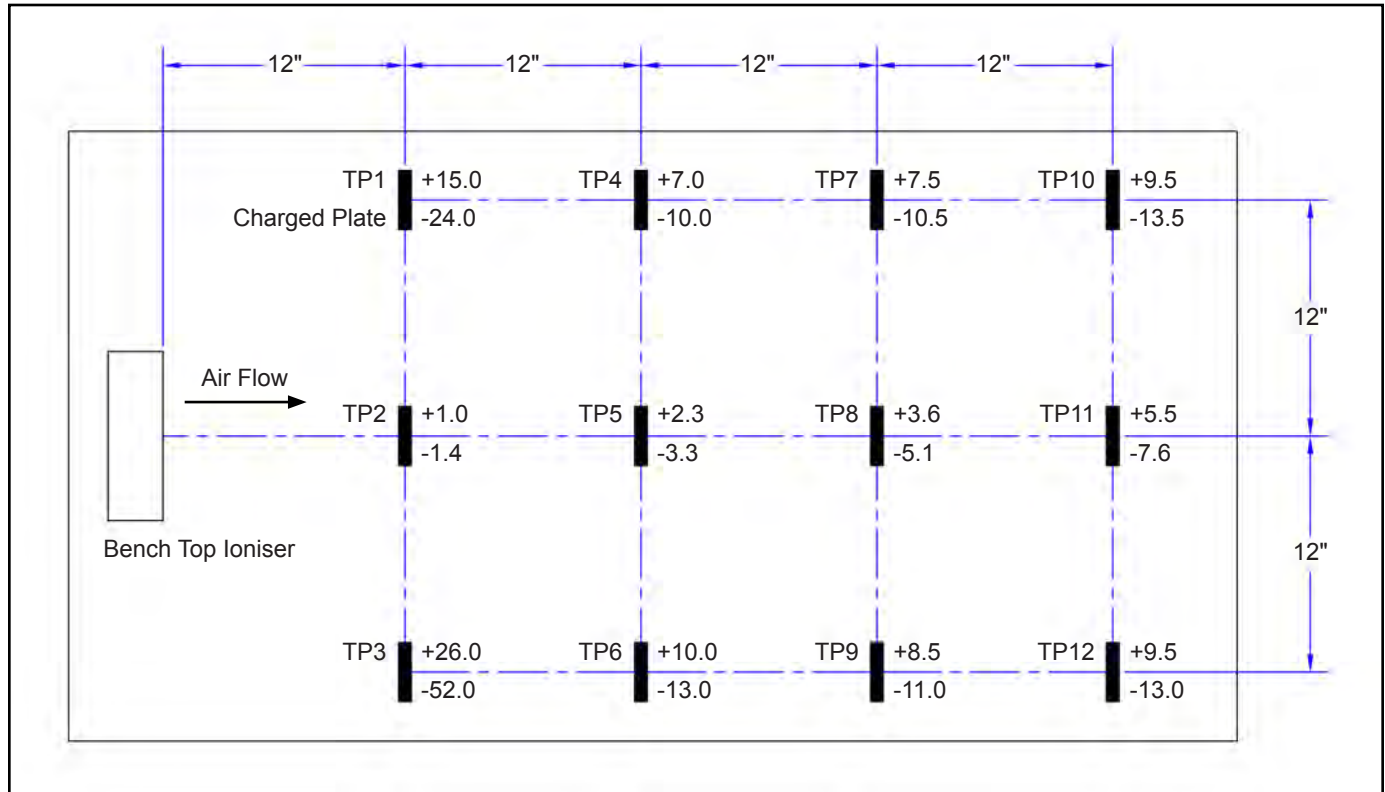


Figure 4. Neutralisation (Discharge) Times at 120VAC / 220VAC, 60Hz input

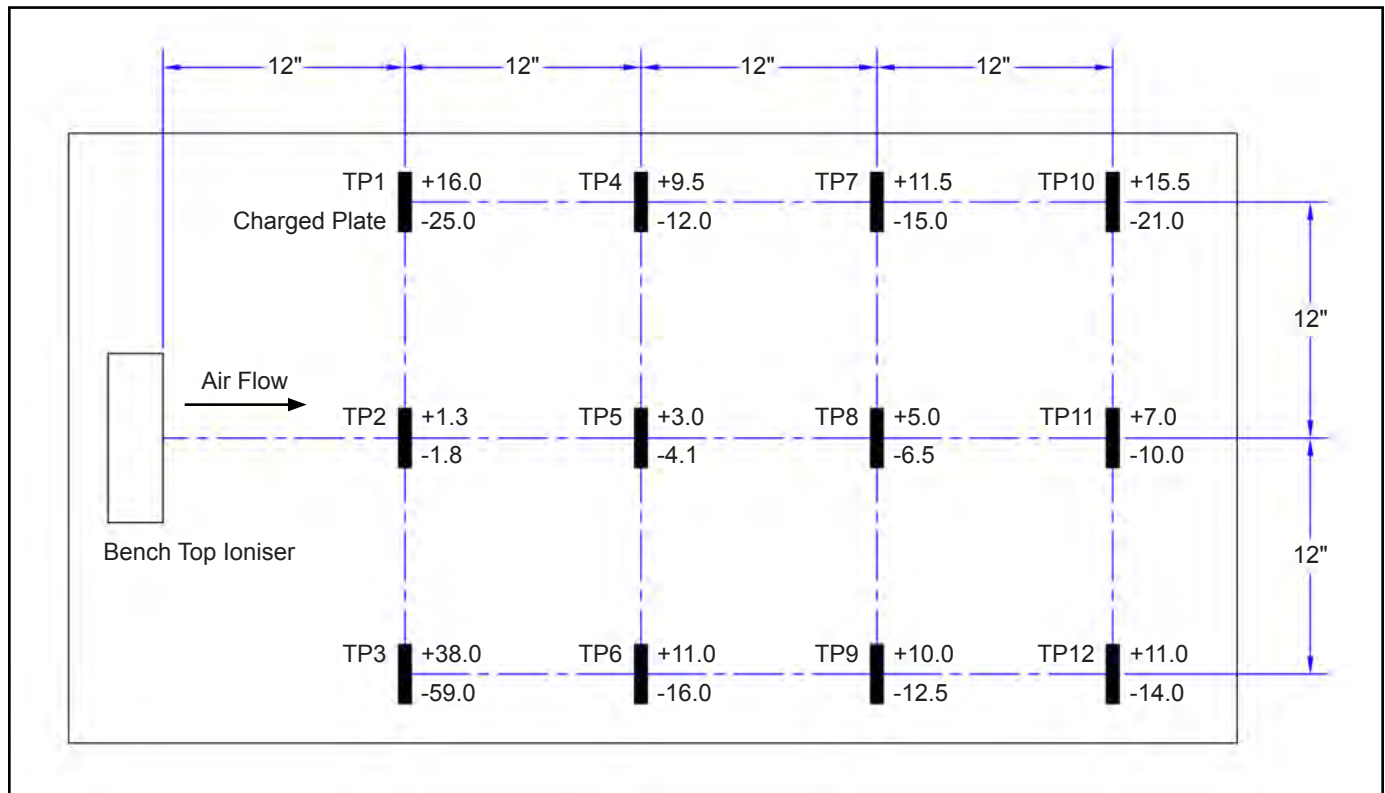


Figure 5. Neutralisation (Discharge) Times at 100VAC, 50Hz input

Calibration

On a regular interval, most users will clean emitter pins and calibrate the ioniser. Per ESD TR 53 section 5.3.6.7.1 "The best practice is to measure the offset voltage and discharge times, clean the unit, including emitter points and air filters if present, offset voltage to zero (if adjustable), and then repeat offset voltage and discharge time testing. If the unit does not meet offset voltage specifications or minimum established discharge time limits, further service is indicated. Manufacturers should provide details on service procedures and typical service intervals."

Most companies will assign a number or otherwise identify each ioniser and setup a compliance Verification / Maintenance / Calibration schedule. If the ionisers all test good, the data can justify lengthening the calibration period. If ionisers require adjustment, the calibration period should be shortened. Although ESD TR53 does not advise a test frequency, JESDD625-A (Revision of EIA-625) recommends ionisers be tested semiannually, noting to use "S3.1 except the number of measurement points and locations may be selected based on the application."

NOTE: A charged plate analyser or monitor should be used in order to properly calibrate the Charleswater Bench Top Ioniser. Charleswater offers the [99096](#) Charged Plate Analyser.

1. Properly setup the ioniser as described in the installation procedure.
2. Turn the unit ON and set the fan speed to High.
3. Position the charged plate analyser 30 cm directly in front of the ioniser.
4. The balance (offset voltage) should be within 0 and ± 2 volts. To increase the output in a positive direction, turn the Balance potentiometer in a clockwise direction. To increase the output in a negative direction, turn the Balance potentiometer in a counter-clockwise direction.
5. Test the neutralisation (discharge) time by applying a $\pm 1,000$ volt charge on the charged plate analyser. The neutralisation (discharge) time should be less than 2 seconds. See figures 4 and 5 for typical discharge times.
6. Test the ioniser's alarm by shorting its two fan grills located on the front (see Figure 6). The alarm should sound, and the STATUS LED should illuminate red.



Figure 6. Shorting the ioniser's fan grills with a metal probe to test the alarm

Specifications

The comparative efficiency of bench top ionisers is determined by a standard test published by the ESD Association: ANSI/ESD STM 3.1. Typical positive and negative discharge times (1000V - 100V) measured using this standard are shown in Figures 4 and 5. The performance of the ioniser was measured with the unit positioned as shown, with the fan speed on high and without a filter.

Air Flow

Three speed fan (125 fpm - 250 fpm, 50 cfm -100 cfm)

Balance (offset voltage) at 30 cm in front of Ioniser (see Figures 4 and 5)

± 3 Volts Typical

± 25 Volts Maximum

(Temperature Range: 65°F - 80°F, RH: 15% - 65%)

Chassis

Powder coated aluminum

Dimensions (with stand)

24 cm x 15 cm x 8 cm

Emitter Points

13 mm diameter

Made of pure tungsten for improved mechanical strength and ionization stability.

Fuse

250mA slow blow

High Voltage Power Supply

5.5kV DC nominal

Input Power

AC line power

Internally selectable for 100/120 VAC - 50/60Hz or
220/230 VAC - 50/60Hz

Ion Emission

Steady-state DC with sense feedback

Mounting

Bench Top tilt adjust frame

Ozone

< 0.05 ppm

Weight

2.0 kg

Limited Warranty

Charleswater expressly warrants that for a period of one (1) year from the date of purchase, Charleswater Bench Top Ionisers will be free of defects in material (parts) and workmanship (labor). Within the warranty period, the product will be tested, repaired or replaced at Charleswater's option, free of charge. Call Customer Service at 00 44 (0) 1892-665313 for a Return Material Authorisation (RMA) and for proper shipping instructions and address. You should include a copy of your original packing slip, invoice, or other proof of purchase date. Any unit under warranty should be shipped prepaid to the Charleswater factory. Warranty replacements will take approximately two weeks.

Warranty Exclusions

THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED.

The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

Limit of Liability

In no event will Charleswater or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.