

## Mini Zero Volt Ioniser Installation, Operation and Maintenance



Made in the  
United States of America



Figure 1. Vermason [200150](#) Mini Zero Volt Ioniser

### Description

The Vermason [200150](#) Mini Zero Volt Ioniser (ZVI) is a compact bench top ioniser used for neutralizing electrostatic charges on insulators and ungrounded conductors in a 6" x 24" coverage area. Its compact size (5.3" high x 3.5" wide x 1.7" deep with stand) allows it to be used in confined spaces such as environmental chambers and automated equipment. It may also be used at standard ESD workstations. Its fast discharge times (< 5 seconds at 12" and  $\pm 5$  Volt offset voltage meet the required limits of ANSI/ESD S20.20 and ESD TR53. Steady-State DC emitters are spaced farther apart to prevent ion recombination, increase decay efficiency and provide a broader coverage area of ionization. The Mini ZVI's two-speed fan (22 CFM to 34 CFM) produces consistent performance at both the low and high speeds. Low airflow may be used when working with small parts and components that may move with higher airflow. The Mini ZVI features a stainless steel enclosure and multi-mount stand to minimize contamination and corrosion when used in clean or sensitive areas.

"Ionisers 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 ionisers, 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)

The Vermason Mini Zero Volt Ioniser operates on Steady-State DC. 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. 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.

Item	Description
<a href="#">200150</a>	Mini Zero Volt Ioniser
<a href="#">200155</a>	Emitter Pin Cleaner, 20 Pack
<a href="#">200165</a>	Replacement Emitter Pins, 100 Pack
<a href="#">200170</a>	Power Adapter, 24VAC, UK Plug
<a href="#">200175</a>	Power Adapter, 24VAC, Europe Plug

### Packaging

- 1 Mini Zero Volt Ioniser
- 1 Ground Cord
- 1 Emitter Pin Cleaner Pack
- 1 Certificate of Calibration

## Features and Components

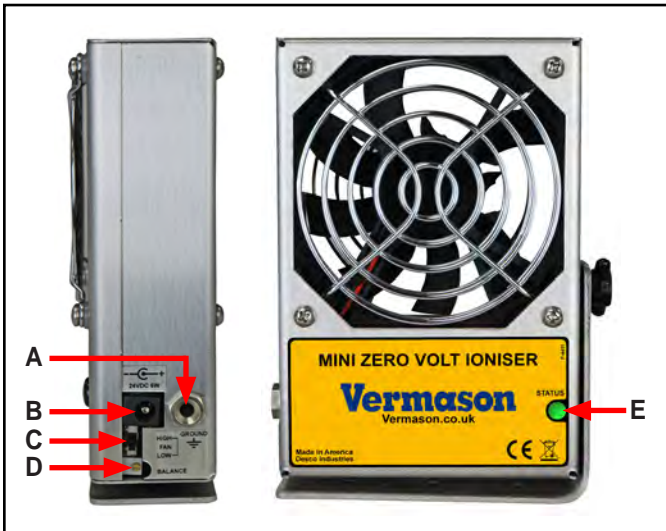


Figure 2. Mini Zero Volt Ioniser features and components

**A. Ground Jack:** Insert the banana plug end of the included ground cord to this jack. Connect the ring terminal end of the cord to equipment ground.

**B. 24VDC Power Jack:** Connect the power adapter here to power the Mini ZVI.

**C. Fan Speed Switch:** Slide the switch down to set the fan speed to LOW. Slide the switch up to set the fan speed to HIGH.

**D. Balance Adjustment Potentiometer:** Turn the potentiometer clockwise for positive adjustment. Turn the potentiometer counter-clockwise for negative adjustment.

**E. Status LED:** The LED will illuminate green when the ioniser runs normally. It will illuminate orange and sound the buzzer should the ioniser experience circuit failure or its emitter pins become too dirty to operate effectively.

## Installation

Place the unit at a desired location where that the airflow will not be restricted. The Mini ZVI's compact size and mountable stand allow it to be installed in confined spaces such as environment chambers and automated machinery.

Connect the ground cord to the ioniser's ground jack. Attach the ring terminal end of the ground cord to a ground point. The face plate screw of a grounded AC wall outlet may provide a convenient connection point.

## Operation

1. Set the fan speed switch to the LOW or HIGH position. Higher airflow will result in faster neutralization rates.
2. Position the ioniser so that maximum airflow is directed towards the items or area to be neutralized.

3. Connect the power adapter to the ioniser to turn it on. When the unit is first turned on, it conducts a self-test. The audible alarm will sound, and the status LED will cycle through orange and green. The LED will remain green during normal operation.



Figure 3. Using the Mini Zero Volt Ioniser at a workstation.

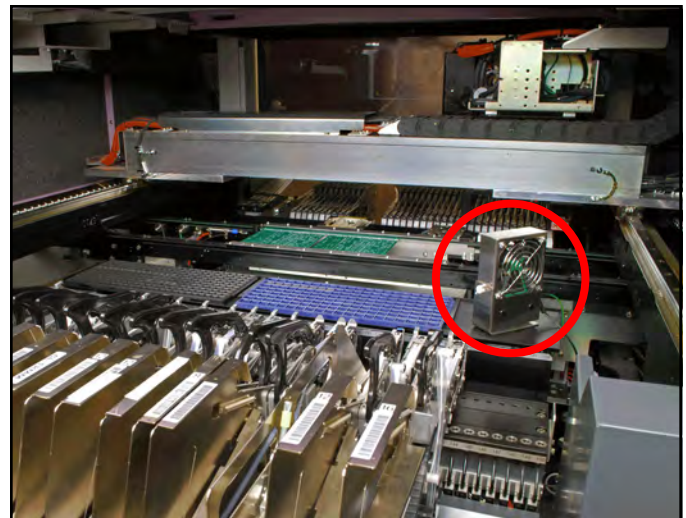


Figure 4. Using the Mini Zero Volt Ioniser inside automated machinery.

## Maintenance

### CLEANING THE EMITTER POINTS

Under normal conditions, the ioniser will attract dirt and dust (especially on the emitter points). To maintain optimum neutralization efficiency and operation, cleaning should be performed on a regular basis.

In the event of circuit failure or dirty emitter pins, the Mini Zero Volt Ioniser will alarm and its status LED will illuminate orange.

The emitter points should be cleaned using the included [200155](#) Emitter Point Cleaners or a swab dampened with Isopropyl alcohol.

1. Turn the unit OFF by disconnecting its power adapter.
2. Remove the rear screen by removing the 4 screws.
3. Clean the emitter points using the included Emitter Point Cleaners or a swab dampened with Isopropyl alcohol
4. Reattach the rear screen.
5. Reconnect the power adapter to turn on the ioniser.
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 [200165](#) Replacement Emitter Points are available for order.

## Adjustments and Compliance Verification

### BALANCE OFFSET VOLTAGE ADJUSTMENT

The Mini Zero Volt Ioniser is an auto-balancing unit. However, tuning or manual adjustment can be accomplished by turning the balance adjustment potentiometer located at the left-side 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.

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 Ionization Test Kit or a Charged Plate Analyzer. 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.

## Neutralization (Discharge) Times

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

NOTE: Discharge times in seconds are representative only and are not a guarantee. Discharge times are actual measurements recorded in a factory ambient environment.

Per ANSI/ESD S20.20, the test method for Product Qualification test is ANSI/ESD STM3.1, and for Compliance Verification is ESD TR53 which advises "Measurements should be made at the location where ESD sensitive items are to be ionized." A larger area may require additional ionizers. Per S20.20 the required limit for ionizer discharge time is user defined. Use Table to determine the number of ionizers to achieve ionization of area to be neutralized to meet your company's ESD control plan specified discharge times.

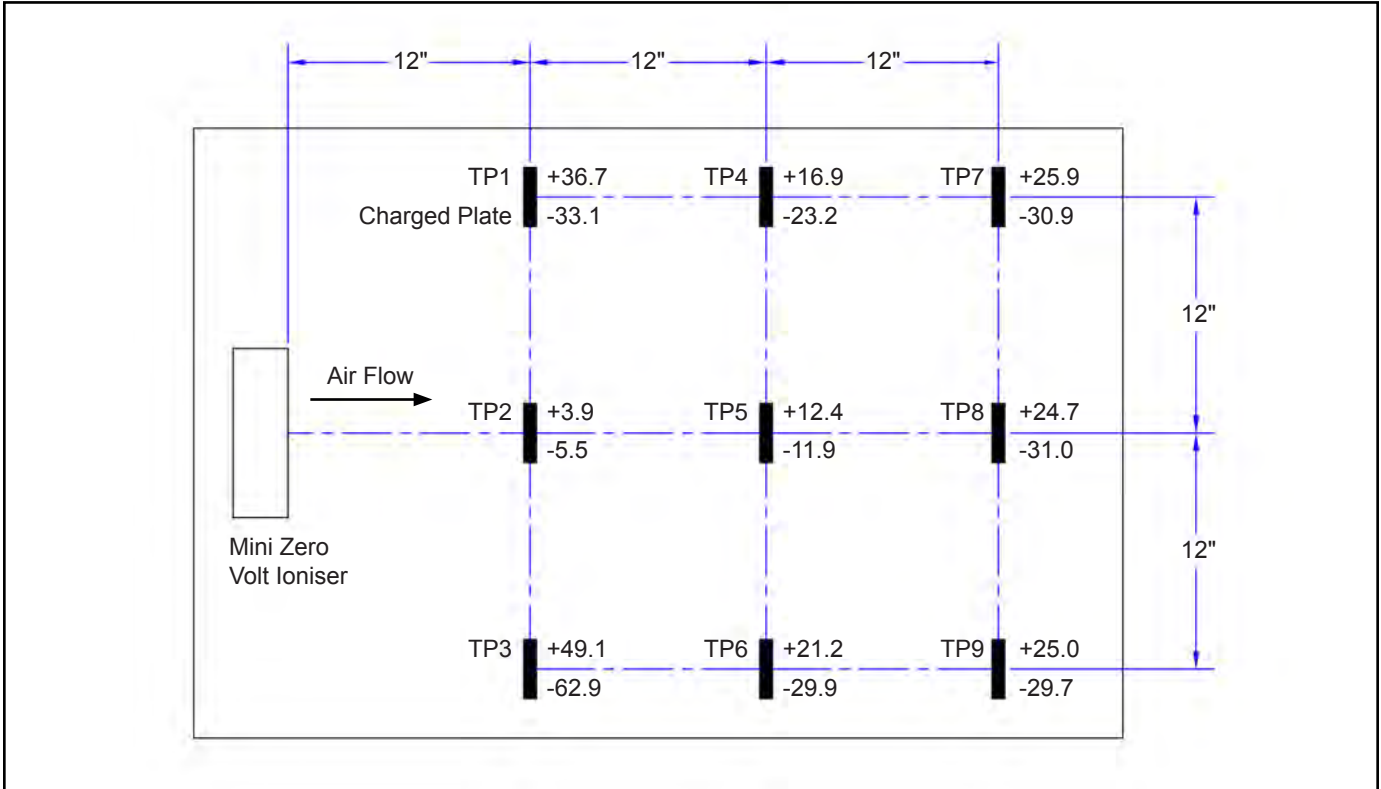


Figure 5. Neutralization (Discharge) Times

## 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 decay times (1000V - 100V) measured using this standard are shown in Figure 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**  
Two speed fan (22 CFM, 34 CFM)

**Balance (offset voltage) at 12" in front of Ioniser**  
±5 Volts Typical  
±25 Volts Maximum  
(Temperature Range: 65°F to 80°F, RH: 15% to 65%)

**Chassis**  
Stainless steel housing

**Dimensions (with stand)**  
5.3" x 3.5" x 1.7"  
13.5 cm x 8.9 cm x 4.3 cm

**Emitter Points**  
.050" diameter  
Made of pure tungsten for improved mechanical strength and ionization stability.

**High Voltage Power Supply**  
5.5kV DC nominal

**Input Power**  
24 VDC, center positive, 2.5 x 5.5 mm power jack

**Ion Emission**  
Steady-state DC with sense feedback

**Mounting**  
Bench top tilt adjust frame

**Ozone**  
< 0.05 ppm

**Weight**  
1.1 lbs (0.5 kg)

## Limited Warranty

Vermason expressly warrants that for a period of one (1) year from the date of purchase, the Vermason Combo Tester will be free of defects in material (parts) and workmanship (labour). Within the warranty period, a unit will be tested, repaired or replaced at Vermason's option, free of charge. Call Customer Service at 0044 (0) 1462 672005 for a Return Material Authorisation (RMA) and for proper shipping instructions and address. Any unit under warranty should be shipped prepaid to the Vermason factory. You should include a copy of your original packing slip, invoice, or other proof of purchase date. Warranty repairs will take approximately two weeks.

If your unit is out of warranty, Vermason will quote repair charges necessary to bring your unit to factory standards. Call Customer Service at 0044 (0) 1462 672005 for a Return Material Authorisation (RMA) and proper shipping instructions and address.

## 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 Vermason 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.

## Additional Limit of Liability

Electronic ionizers use high voltage corona discharge and should not be used in or near flammable or explosive environments. In no event will Vermason 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.