

# Benchtop AC Ionizer Installation, Operation, and Maintenance



Figure 1. Trustat® 19550 Benchtop AC Ionizer

## Description

The Trustat® 19550 Benchtop AC Ionizer is used for neutralizing electrostatic charges on insulators and ungrounded conductors. Its discharge times (< 1 second at 12") and ±10 Volt offset voltage meet the required limits of ANSI/ESD S20.20 and ESD TR53. The Trustat® Benchtop AC Ionizer generates AC high voltage to produce an airflow rich in positive and negative ions. The fan speed is controlled by a two-state rocker switch for low (52 CFM) and high (76 CFM) airflow. The low wattage heating element can be enabled to improve operator comfort. The emitters can be quickly and regularly cleaned by fully rotating and releasing the knob located over the center of the fan. The Trustat® Benchtop AC Ionizer features a powder coated steel enclosure and stand.

Ionizers are useful in preventing electrostatic charge generation, electrostatic discharge, electrostatic attraction, as well as preventing equipment latch-up. Per ANSI/ESD S20.20 section 6.2.3.1. Protected Areas Requirement states: "Ionization or other charge mitigating techniques shall be used at the workstation to neutralize electrostatic fields on all process essential insulators if the electrostatic field is considered a threat." "Air ionization can neutralize the static charge on insulated and isolated objects by producing separate charges in the molecules of the gases of the surrounding air. When an electrostatic 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." (Reference: EN 61340-5-2:1 clause 5.2.9)

"The primary method of static charge control is direct connection to ground for conductors, static dissipative materials, and personnel. A complete static control program must also deal with isolated conductors that cannot be grounded, insulating materials (e.g., most common plastics), and moving personnel who cannot use wrist or heel straps or ESD control flooring and footwear. Air ionization is not a replacement for grounding methods. It is one component of a complete static control program. Ionizers are used when it is not possible to properly ground everything and as backup to other static control methods. In clean rooms, air ionization may be one of the few methods of static control available." (ESD Handbook ESD TR20.20 Ionization, section 5.3.6.1 Introduction and Purpose / General Information)

## Packaging

- 1 Trustat® Benchtop AC Ionizer
- 1 Snap-on Filter Retainer
- 1 Air Filter
- 1 Power Cord with North America Plug, 6 ft.
- 1 Certificate of Calibration

## Features and Components

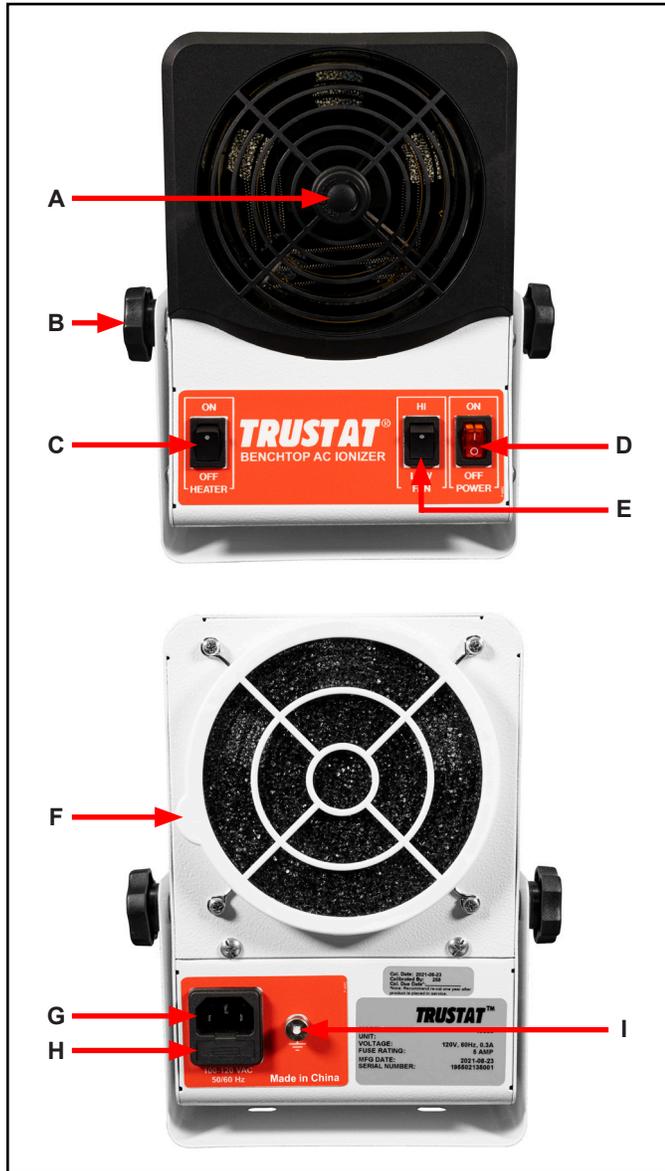


Figure 2. Trustat® Benchtop Ionizer features and components

**A. Emitter Point Cleaner Knob:** Remove the cap to expose the balance offset voltage adjustment potentiometer. Turn the potentiometer clockwise for positive adjustment. Turn the potentiometer counter-clockwise for negative adjustment.

**B. Tilt Lock Knob:** Loosen and tighten the two knobs to tilt the ionizer and alter its direction of airflow.

**C. Heater Switch:** Toggle the switch up to turn the heater ON. Toggle the switch down to turn the heater OFF.

**D. Power Switch:** Toggle the switch up to turn the ionizer ON. Toggle the switch down to turn the ionizer OFF.

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

**F. Snap-on Filter Retainer:** Use the snap-on retainer to install the filter onto the air-intake grill at the back of the ionizer.

**G. Power Inlet:** Connect the power cord here.

**H. Fuseholder:** Stores the 5 A slow-blow fuse for powering the ionizer.

**I. Ground Terminal:** For best performance, the blower chassis-ground terminal and all worksurfaces in proximity to the target (i.e. wokbench, ESD mat) should always be wired to a reliably earthed electrical point.

## Installation

Place the unit at a desired location where the airflow will not be restricted. Use the tilt lock knobs to aim the ionizer at the area to be neutralized. Ensure that the power switch is set to OFF. Connect the ionizer's power cord into an appropriate AC power source.

## Operation

1. Position the ionizer so that maximum airflow is directed towards the items or area to be neutralized.
2. Turn the unit ON. The power LED will illuminate and remain solid.
3. Set the fan speed switch to the desired setting. Higher airflow will result in faster discharge times.
4. Use the heater switch as desired to enable the heater for operator comfort.



Figure 3. Using the Trustat® Benchtop Ionizer at a workstation

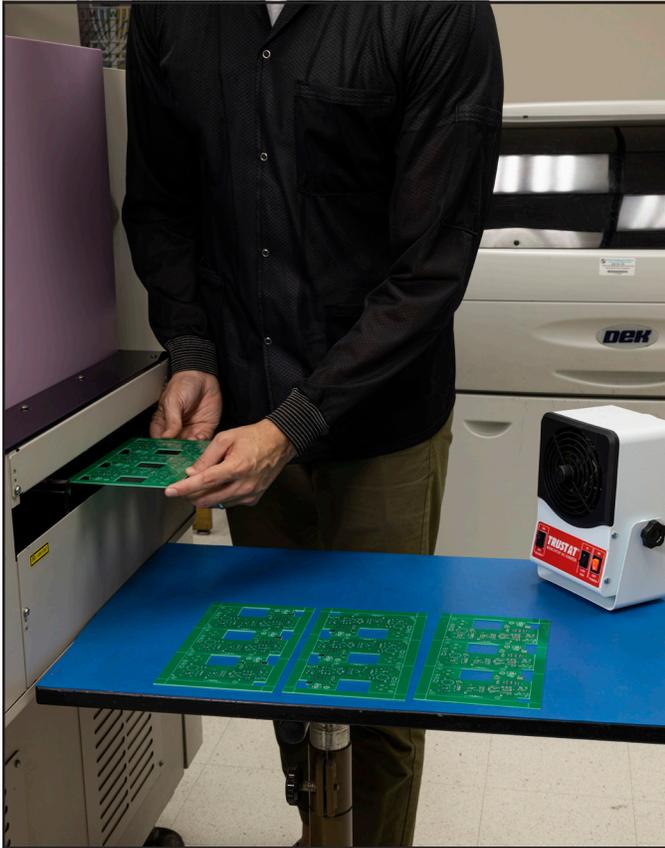


Figure 4. Using the Trustat® Benchtop Ionizer at a machine station

## Maintenance

Under normal conditions the ionizer will attract dirt and dust, especially on the ionizing electrodes. To maintain optimum neutralization efficiency and operation, cleaning should be performed on a regular basis. Maintenance at least once a month is recommended to preserve optimum neutralizing performance. The ionizing electrodes can be quickly and regularly cleaned by fully rotating and releasing the Emitter Point Cleaner Knob located over the center of the grill on the front panel of the blower.

An air-intake filter and retainer have been provided for some applications and/or environments outside of the Cleanroom and Medical Industries. Users in more dirty manufacturing environments should install the filter onto the air-intake grill (on rear panel of unit) using the snap-on retainer to keep the inside of the blower clean. This filter should be changed every 2 to 4 weeks or as needed per a visual inspection.

The balance of the unit is intrinsic due to its floating ionization circuit. Hence, balance and long-term drift are nominally zero for a normally functioning unit. Periodic cleaning is beneficial for maintaining minimum discharge times. Both the discharge time and balance may be tested using a charged plate analyzer.

If necessary, the unit may be disassembled for more extensive maintenance and cleaning beyond that described above.

**NOTE: The AC power cord MUST be disconnected before the unit can be disassembled for maintenance.**

First, turn the unit OFF and unplug the power cord. Unthread and remove 3 Phillips head screws on each side and 2 in rear (8 total). The bottom/base chassis plate and ionization-circuit subassembly can next be separated from the top/cover chassis plate and fan.

If necessary, the heater-element subassembly and the ionizer subassembly may be separated from the air-exit grill subassembly after first unthreading 4 Phillips-head screws, and then removing the 4 black ionizer retaining clips freed by the screw removal.

Similarly, the fan may be separated from the chassis top by unthreading the 4 corner retaining nuts inside the chassis. Wires may be disconnected at fast-on terminals (i.e. fan, ionizer subassembly) for further disengagement if necessary. Take careful note of all wire and terminal positions before disconnection to correctly reassemble the unit after cleaning.

The emitter pin electrodes may be cleaned using a Q-Tip type cotton swab or a soft nylon toothbrush dampened with IPA (Isopropyl alcohol). Clean the blades of the fan and other accessible internal surfaces using a soft-bristle brush or cloth agitator and/or compressed air.

**Use caution when cleaning inside the blower. The ionizing electrodes are sharp.**

After cleaning, reassemble all internal components and subassemblies and reconnect all wiring as required. Reengage the bottom and top blower sections and fasten by fully threading the 8 external chassis screws. Plug in the power cord and turn the unit back ON.

## Neutralization (Discharge) Times

All data was taken without an air filter installed and the fan speed set to high. All 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.

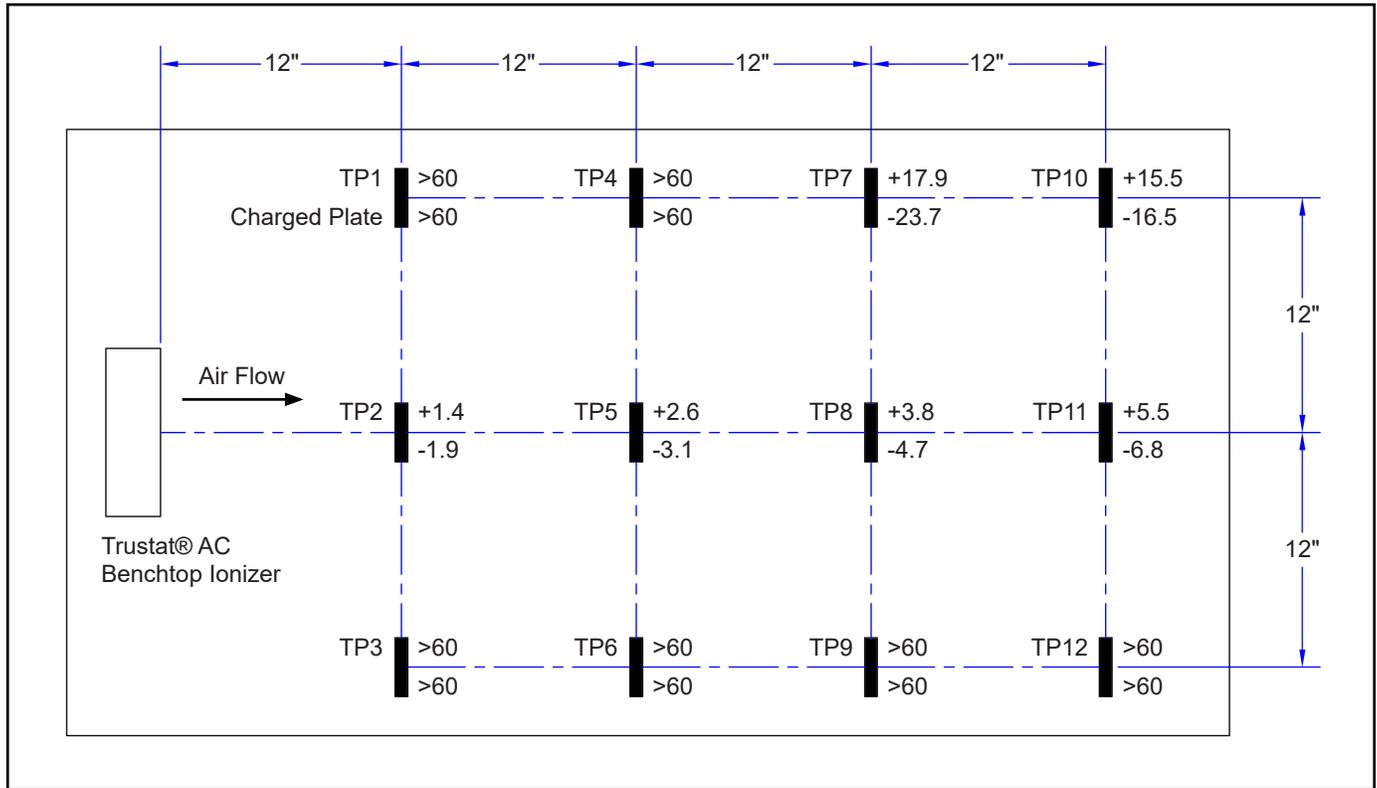


Figure 5. Neutralization (discharge) times at 120 VAC, 60 Hz input

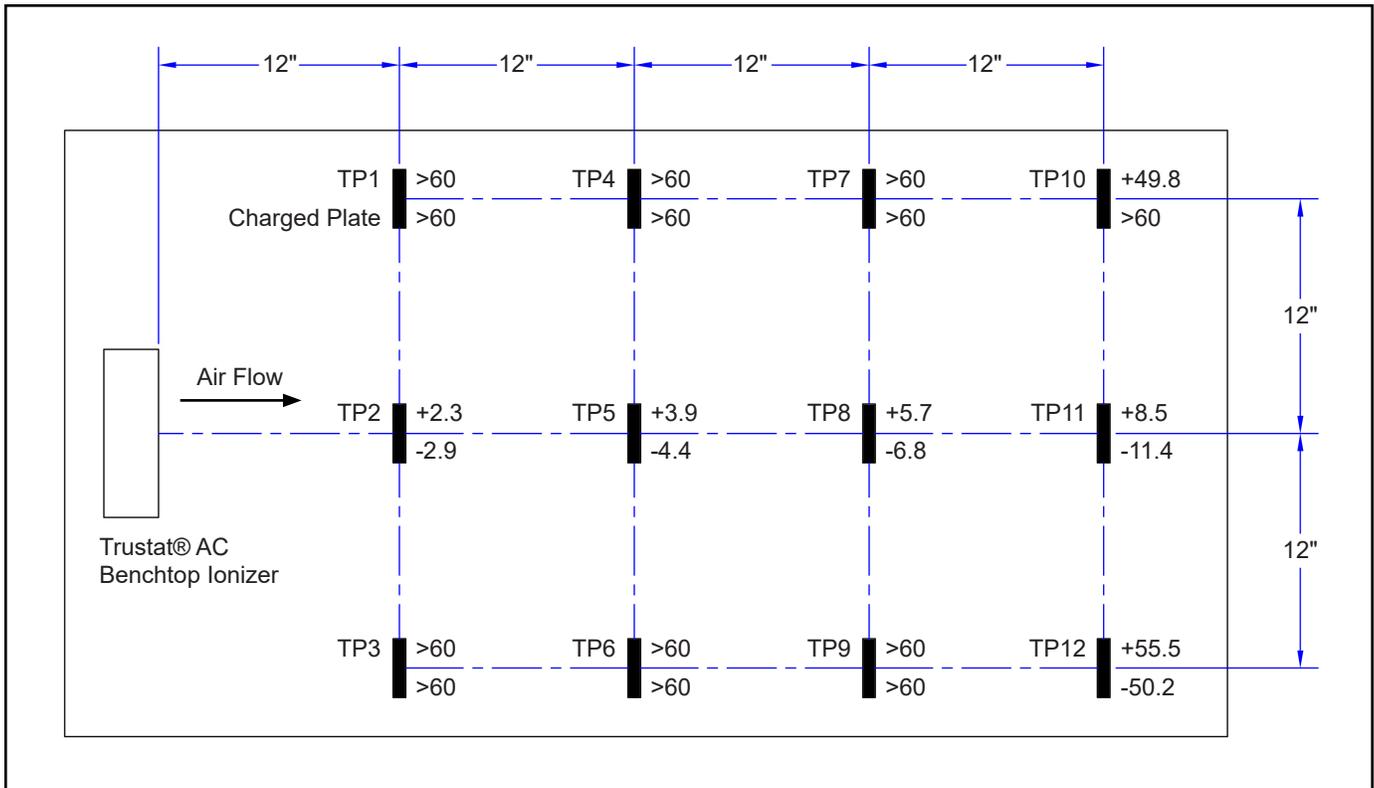


Figure 6. Neutralization (discharge) times at 100 VAC, 50 Hz input

## Specifications

Input Voltage	100-120 VAC, 50/60 Hz	Input Fuse	5A slow-blow
Input Current	1.9 A (heater ON, fan HIGH) 1.8 A (heater ON, fan LOW) 0.3 A (heater OFF, fan HIGH) 0.2 A (heater OFF, fan LOW)	Chassis	Steel enclosure, powder-coated epoxy/polyester paint finish
Air Velocity (on fan center axis)	600 FPM (fan HIGH @ 1 ft.) 420 FPM (fan LOW @ 1 ft.)	Air Filter (Optional)	Open cell polyurethan foam (30 pores per in.)
Air Delivery Rate	76 CFM (fan HIGH) 52 CFM (fan LOW)	Ozone	0.01 ppm (fan LOW, 6 in.)
Ionization Balance	±10 V typical (65° to 80° F, 15% to 65% RH)	Audible Noise	54 dBA SPL (fan LOW, 1 ft.) 61 dBA SPL (fan HIGH, 1 ft.)
Ionization Voltage	60 Hz AC, AC coupled	Weight	7.1 lbs. (3.2 kg)
Ionization Emitter	Radial configuration, 10 stainless steel electrodes with fine ground terminal radius	Dimensions (with stand & knobs)	9" x 7.5" x 5.25" (229 mm x 191 mm x 133 mm)
Heated Air	15° F rise above ambient (fan LOW, 6 in.) 8° F rise above ambient (fan HIGH, 12 in.)	Mounting	Benchtop tilt-adjusted stand with locking knobs, black polymer feet; can also be wall mounted or shelf mounted using slots in stand and 2 screw (1/4" thread)
HV Generator	Isolation transformer	Country of Origin	China
Input Wiring	IEC-320 C14 AC inlet with fuseholder	<b>Limited Warranty, Warranty Exclusions, Limit of Liability and RMA Request Instructions</b> See the Desco Warranty - <a href="https://www.desco.com/Limited-Warranty.aspx">Desco.com/Limited-Warranty.aspx</a>	
Input Cord	NEMA 5-15P to IEC-320 C13, 6 ft.		