

# Static Control

## Tempest BTI

### Benchtop Ionizing Blower

#### Overview

The Tempest BTI Benchtop Ionizer generates AC high voltage, producing balanced ionized airflow to eliminate static charges on target work surfaces. The unit can be placed at one end of the workbench, or mounted on the wall or shelf, and directed at the target or area to be neutralized. The ionizer is designed to neutralize charge on a target located one to four feet in front of the unit. Discharge time increases with distance from the unit.

#### General Guidelines

- Keep water, oil, contamination and any fluids away from the blower at all times
- Keep the unit clean internally and externally for optimal performance

**Caution! Disconnect the unit from power before performing any maintenance, inspection or cleaning to avoid an electrical shock hazard and to prevent damage to the unit!**

#### Contents

Remove the ionizer from the carton and inspect for damage. Included with the unit should be:

- (1) Tempest BTI Benchtop Ionizer with stand and adjustment knobs installed
- (1) Detachable NEMA/IEC power cord (120V)
- (1) Round foam air filter with (1) snap-on retainer
- This IOM (installation, operation, maintenance) instructions manual

#### Installation

Locate the ionizer 1 to 4 feet from the area or target to be neutralized, making sure that the airflow will not be restricted. The unit comes with a stand so that it can be positioned on the work surface, aimed at the target and adjusted for inclination using the Tilt Lock Knobs. It can also be wall-mounted or shelf-mounted to keep valuable bench space free for other purposes and equipment. A working electrical outlet within reach of the 6' -long detachable cord that is supplied with the blower will be required. The outlet must be a properly installed and grounded 3-prong outlet with supplied voltage to match the



blower being installed. If one is not present, consider relocating the blower to be within reach of an outlet, or having an electrical outlet installed near the blower. Be sure the ON/OFF Power Switch, located rightmost on the lower front panel of the unit, is in the OFF position. Plug the power cord into the blower AC-inlet jack (on rear panel of unit) and then into the appropriate AC power-source outlet.

**Important Note:** Before powering up the unit, verify that the AC outlet is properly grounded and that the supplied line voltage matches the electrical specification on the rear panel of the Tempest BTI blower. Plugging the blower into an outlet with the incorrect voltage may damage the unit and will void any warranty coverage.

#### Operation

Set the Fan Speed Switch (just to left of Power Switch) to the LOW or HIGH position as preferred for operator comfort and target discharge time. Higher airflow will result in faster discharge. Position the unit so that the maximum airflow is directed at the items or area to be neutralized.

If heating is desired for operator comfort also set the Warm Air Switch, located leftmost on the lower front panel of the unit, to the ON position. Otherwise set to the OFF position.



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## Tempest Benchtop Ionizer

The unit can next be operated by setting the Power Switch ON.

There are no user serviceable parts in this unit. Routine cleaning is the only maintenance that the user must perform.

### 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 Point Cleaner Knob, located over the center of the air-exit 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 - 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 maintainiinnng minimum discharge times. Both the discharge time and balance may be tested using a charge 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/slotted-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 (e.g. fan, ionizer subassembly) for further disengagement if necessary. Take careful note of all wire and terminal positions before disconnection in order to correctly reassemble the unit after cleaning.

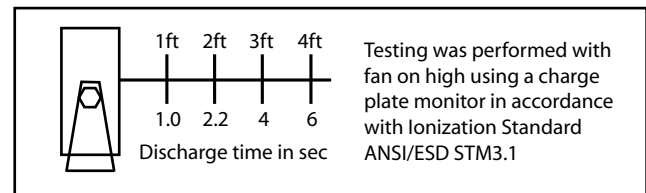
The emitter pin electrodes may be cleaned using a Q-Tip type cotton swab or a soft nylon toothbrush dampened with IPA (Isopropyl alcohol). Clean the blades of the fan and other accessible internal surfaces using a soft-bristle brush or cloth agitator and/or compressed air.

**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

The comparative efficiency of benchtop ionizers is determined by a standard test published by the ESD Association: Standard S3.1. Positive and negative discharge times (from 1000 Volts to 100 Volts on charge plate) are measured in tenths of a second using this standard. This test was performed with the unit positioned as shown, with the fan speed on high, and without a filter. Discharge times are as shown below.



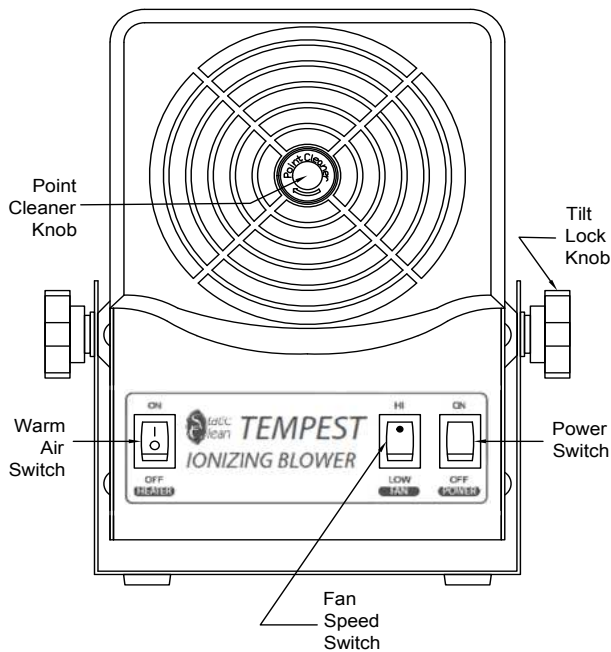
For best performance the blower chassis-ground stud (located on rear panel of unit) and all work surfaces in proximity to the target (e.g. workbench, ESD mat) should be always wired to a reliably-earthed common electrical terminus.

**NOTE:** Unauthorized servicing or modifications to your ionizer will void the product warranty and may create dangerous conditions. Servicing should be performed only at the factory, or by a factory approved technician.

### Troubleshooting and Service

Contact Static Clean for assistance with troubleshooting, service, replacement filters, parts information and pricing.

# g Blower



- Input Wiring IEC-320 C14 AC inlet with fuseholder
- Input Cord NEMA 5-15P to IEC-320 C13, 6 ft
- Input Fuse 5A slow-blow (fuseholder in AC inlet)
- Chassis Steel enclosure, powder-coated epoxy/polyester paint finish
- Air Filter (optional) Open-cell polyurethane foam (30 pores per in)
- Ozone 0.01ppm (fan LOW, 6 in)
- Audible Noise 54 dBA SPL (fan LOW, 1 ft)  
61 dBA SPL (fan HIGH, 1 ft)
- Weight 7.1 pounds (without power cord)
- Dimensions 9 in (height)  
(with stand, 7 ½ in (width)  
tilt-lock knobs ) 5 ¼ in (depth)

## Specifications

- Input Voltage 120 V<sub>AC</sub>, 60 Hz
- Input Current 1.9 A<sub>AC</sub> (heater ON, fan HIGH)  
1.8 A<sub>AC</sub> (heater ON, fan LOW)  
0.3 A<sub>AC</sub> (heater OFF, fan HIGH)  
0.2 A<sub>AC</sub> (heater OFF, fan LOW)
- Air Velocity (on fan-center axis) 600 FPM (fan HIGH, 1 ft)  
420 FPM (fan LOW, 1 ft)
- Air Delivery Rate 76 CFM (fan HIGH)  
52 CFM (fan LOW)
- Ionization Balance 0 ± 10 V typical (temperature range:  
65 °F to 80 °F, RH: 15% to 65%)
- Ionization Voltage 60 Hz AC, AC-coupled
- Ionization Emitter Radial configuration, 10 stainless-  
-steel electrodes with fine-ground  
terminal radius
- Heated Air 15 °F rise above ambient  
(fan LOW, 6 in)  
8 °F rise above ambient  
(fan HIGH, 12 in)
- HV Generator Isolation transformer

- Mounting Benchtop tilt-adjust stand with locking  
knobs, black polymer feet; can also be  
wall-mounted or shelf-mounted using slots  
in stand and 2 screws (¼-in thread  
diameter)

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#### Limited Warranty

Static Clean expressly warrants that for a period of one (1) year from the date of purchase, the ionizer will be free of defects in material (parts) and workmanship (labor). Within the warranty period, a unit will be tested, repaired, or replaced at discretion of Static Clean, free of charge. Any unit under warranty should be shipped prepaid to the Static Clean factory. Call Customer Service at (781) 229-7799 for a Return Material Authorization (RMA) number and shipping instructions. Include a copy of your original packing slip, invoice, or other proof of purchase date.

If the unit is out of warranty, Static Clean International, Inc. will quote repair charges necessary to bring your unit up to factory standards.

#### 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 that is 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

The user shall determine the suitability of the product for the intended use, and the user assumes all risk and liability whatsoever in connection therewith.

#### About Static Clean

At Static Clean International, we've been providing Static and Contamination Control Solutions to clients nationwide since 1973. We capitalize upon this wealth of experience to service our customers in a variety of ways. Whatever their needs, our comprehensive approach to controlling static / contamination translates into a much lower total cost of ownership solution for them.

#### Industrial/Medical/Electronics Applications

For our customers, we provide a line of Static and Contamination Control industrial products including static bars, power supplies, air guns, airknives, benchtop and overhead ionizers and WebVacs that we manufacture ourselves. These exceptional products address a host of common process problems including mis-feeds, poor lamination, jogging and stacking problems, shock to operators, jammed injection molds, particle contamination, fires and explosions.



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