

# Static Eliminator

# ION 160

Benchtop Ionizer for ESD and  
Light-Duty Industrial Applications

## Instruction Manual

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## **INTRODUCTION**

You now own the most advanced and effective bench top ionizer on the market... The ION 160.

This electrically powered ionizer incorporates new engineering and design features which enables it to neutralize static charges more effectively than ever. Thanks to the patented self-balancing circuit, the ION 160 combines the balance of a nuclear ionizer with the fast decay rate available only with an electrical ionizer.

Best of all, the ION 160 is electrically operated, so there are none of the objections associated with nuclear static eliminators: no special licensing, time consuming record keeping, expensive rental fees, or diminishing performance due to radioactive half-life. With the ION 160 you get years of trouble-free static protection, period.

Operator comfort is designed into the ION 160. The air flow is adjustable from 38 to 76 liters/sec (80 to 100 cfm) to obtain the best air flow for the conditions. At the operator's option, the heater can be switched on to warm the ionized air for operator comfort.

Because the ION 160 is state-of-the-art, it is extremely simple to install, operate and maintain. It will only take a few moments to familiarize yourself with this manual. Then, you'll be ready to use the ION 160 to eliminate static in your workplace.

## **INSTALLATION & OPERATION**

The ION 160 is designed to be used on a tabletop (with or without the tilt stand), permanently fastened to a vertical wall, or used with the optional telescoping stand. The ION 160 operates on 115 VAC or 230 VAC at 50/60 Hz. It must be grounded in an appropriate 3 terminal receptacle for proper operation.

The ION 160 ionizer includes a patented circuit to produce a balanced mixture ( $0 \pm 5$  volts) of positive and negative ions. Balanced means that any object that is isolated from ground and in the air stream will not accumulate any net potential or charge greater than  $0 \pm 5$  volts.

The ION 160 is a self-balancing ionizer. All you have to do is turn the power switch on and the patented balance circuit will maintain the ion balance of positive and negative ions automatically. Air ionization neutralizes static charges on surfaces by increasing the electrical conductance of the air to ground. The effectiveness of an ionizer decreases as the distance from the ionizer increases. The ionizer should be placed approximately 1/3 meter (1 ft.) from the boundary of the area to be protected. See page 3 for performance information.

The air velocity of the ION 160 is controlled by the fan speed knob on the back panel of the ionizer. Low fan speed should be adequate for most situations. High fan speeds may be used to protect larger work surfaces. The built-in heater can be switched on or off at the operator's discretion. The heater switch is located next to the power switch on the back panel. The heater is not powered when the power switch is in the off position.

## **PERFORMANCE DATA**

- A.** Decay Rate: The decay rate of an ionizer is a measure of how effectively static is eliminated. The EOS/ESD Association, an independent industry organization, has standardized a measurement method for evaluating ionizers, EOS/ESD Standard 3.1. The standard measures the time required for an ionizer to reduce the charge on a 20 pico-Farad plate from 1000 volts to 100 volts, measured in seconds. Lower decay rates indicate where static neutralization is most efficient.

The ION 160's decay rate at the 12 points measured by EOS/ESD S 3.1 are shown in the table below. The ION 160 provides the fastest overall decay rate of any ESD ionizer when evaluated to the standard. The ION 160 will effectively neutralize static charges over a larger area than that shown in the table, with the most effective neutralization occurring at points closest to the center line of the unit.

- B.** Ion Balance: Static results from an imbalance of ions, either positive or negative, and is measured in volts. Charges in unprotected areas can range into the thousands of volts. Ordinary ionizers often produce more ions of one charge than the other, resulting in ion imbalance, i.e., incomplete static elimination. Your ION 160 includes a patented self-balancing circuit which automatically maintains the residual voltage within  $0 \pm 5$  volts in the protected area.

<b>ION 160 DECAY TIMES (seconds) PER EOS/ESD - S3.1</b>			
DISTANCE FROM THE IONIZER OUTLET	12 INCHES LEFT OF THE CENTERLINE	ON CENTERLINE	12 INCHES RIGHT OF THE CENTERLINE
12 INCHES	23.5 SEC	0.8 SEC	24.5 SEC
24 INCHES	5.5 SEC	1.6 SEC	5.8 SEC
36 INCHES	5.5 SEC	2.8 SEC	5.3 SEC
48 INCHES	7.3 SEC	3.8 SEC	6.0 SEC
(Time required to decay a 20pf plate from 1000V to 100V)			

## **MAINTENANCE**

- A.** General Cleaning: Cleaning of the case for aesthetic reasons is best done with a clean lint-free cloth or wiping pad dampened with isopropyl alcohol or distilled water. Ordinary household or glass cleaners can leave a conductive residue and should not be used. Remove dust from the air inlet and outlet with a brush or vacuum.
- B.** Emitter point cleaning: Ground Zero recommends routine cleaning by brushing the ionizing points monthly to maintain peak performance. The points and air channel should be cleaned thoroughly once a year (more often in a dirty environment).

**Caution: Unplug the unit or turn power off before cleaning.**

Routine cleaning: To clean the ionizing points, insert the cleaning brush included with the unit through the openings in the front bezel. Brush off each point.

Thorough cleaning (at least once per year): Loosen the four cap head screws holding the bezel to the front of the unit using the 3mm hex wrench included with the unit. Remove the bezel assembly from the ionizer. Blow the entire bezel assembly with clean, dry air to remove dust and dirt. Use the brush to remove particles from the ionizing points.

If the emitter assembly is extremely dirty, clean the entire bezel assembly with a mixture of clean isopropyl alcohol and distilled water using a fine bristle brush (soft toothbrush). Allow the assembly to air dry.

Blow the air channel and fan blades with clean, dry air before replacing the bezel assembly. If desired or necessary, wipe the air channel with a soft cloth dampened with the mixture of isopropyl alcohol and distilled water. **Caution: Ordinary glass and household cleaners leave a conductive residue and should never be allowed to contact the bezel or interior of the unit.**

Install the bezel assembly into the front of the ionizer. Tighten the four cap head screws until the bezel is snug against the case. The word "power" should be on the right-hand side as you face the bezel.

- C.** Emitter assembly replacement: After years of service or in the event of damage, the emitter assembly (bezel) can be replaced easily. Order Ground Zero part number ION-160-001. Use the removal and re-installation instructions for electrode cleaning described above.
- D.** Ion Balance (Residual Voltage) Adjustment: The ION 160 is a self-balancing ionizer and no adjustment is required. When the unit is turned on, a patented circuit will automatically balance the residual voltage at  $0 \pm 5$  volts.

## **TROUBLESHOOTING**

- A.** Should your unit fail to operate, check to see if the line power cord is secure. If your ION 160 still doesn't operate, check the condition of the fuse located in the power inlet on the back panel. Slide out the fuse drawer and remove the fuse. If blown, replace with a fuse as specified on page 5.
- B.** If the ION 160 is not ionizing, check the following:
  - 1. Make sure that the four screws holding the bezel in place are tightened snugly (do not over tighten).  
NOTE: To check for ionization, turn the fan speed to low and listen for a hissing sound (corona discharge) at the outlet of the unit. Another way to verify ionization is to look for a blue discharge (corona) at the tip of the points (in a darkened room).
- C.** If the ionization is low, check the following:
  - 1. Clean the unit. This will bring the ionization back to normal if the ionization points are dirty.
  - 2. Increase the fan speed to increase the area of coverage.
  - 3. Verify that the work surface is grounded.
  - 4. Verify that the bezel is oriented such that the word "power" is on the right.
- D.** If the ion balance is greater than  $0 \pm 5$  volts, check the following:
  - 1. Make sure that the line power cord is plugged into a three-terminal receptacle. Verify that the ground terminal of the three-terminal receptacle is grounded. The balancing circuit uses the ground connection (third prong of the receptacle) to control residual voltage. Defeating the ground with an improperly installed adapter or extension cord may cause the unit to run in an out-of-balance condition.
  - 2. Do not ground the bezel screen or attach a ground lead from a balance meter to the bezel screen. Use the workstation ground (or the fan guard on the back panel of the ION 160) as a ground point for instrumentation.
  - 3. Verify that the work surface is grounded.

## WARRANTY

STATICO products are guaranteed to be free from defects in material and labor for a period of two years from date of shipment. Components found to be faulty due to material or workmanship after examination in our plant will be repaired or, at our option, replaced without charge for labor or material.

A return authorization number must be obtained from Ground Zero before returning any product for assessment.

## FCC INFORMATION

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

## SPECIFICATIONS

Line Voltage:	115 VAC or 230 VAC, 50/60 Hz
Power:	35 Watts (heater off) 435 Watts (heater on)
Fuse:	5 x 20 mm, time-lag, 250 Volt 115 VAC unit supplied with 5.0 amp fuse 230 VAC unit supplied with 2.5 amp fuse
Ion Balance:	Self-balancing unit will maintain 0±5 volt balance at all normal operating conditions.
Air Volume:	Variable 38 to 76 liters/sec (80 to 160 dm)
Air Velocity:	2.8 m/sec at 0.6 meters (550 ft/min at 2 ft) at maximum fan speed
Angle of Coverage:	60 degrees
Heater Air:	At maximum air flow: 4.4°C (8°F) rise above ambient At minimum air flow: 8.8°C (16°F) rise above ambient
Sound	
Pressure Level:	63 dbA max at 0.6 meters (2 ft) at maximum fan speed
Maximum Ozone	
Production:	Per UL 867 requirements
EMI/RFI:	Complies with FCC Part 15 requirements for Class equipment
Dimensions:	305 mm wide x 159 mm high x 254 mm deep (12 x 6.25 x 10 inches)
Weight:	3.6kg (81bs)



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