Description
This ionizing unit is a self-balancing bench top ionizer. The ionizer’s Faraday Balance System assures low offset voltage or balance automatically. It offers greater efficiency and easier cleaning than conventional ionizers. The Bench Top Ionizer is designed to neutralize static electricity from insulators and isolated conductors in localized work areas in assembly rooms, wave solder lines, laboratories, QC, test stations, packing and shipping areas and clean rooms.

Ionizers are useful in limiting electrostatic charge generation, ElectroStatic Discharge, and ElectroStatic Attraction, as well as preventing equipment latch-up. ANSI/ESD S20.20 Paragraph 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.” Some examples of process necessary insulators are: the PC board itself, plastic test stands, plastic housing where a PCB may be mounted, as well as computer monitor screens and regular cleaning wipes. Examples of floating or isolated conductors are: loaded PCB mounted in a stand where the pins are not contacting the dissipative workstation. Ionization is not effective on items that have large capacitance, like people and carts; however, ionizers should be considered as a method for charge neutralization in cases where grounding cannot be achieved.

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: IEC 61340-5-2:1 paragraph 5.2.9).

Ionizer Selection
ANSI/ESD S20.20 section 6.1.1.2. ESD Control Program Plan Guidance states: “The Plan should include a listing of the specific type of ESD protective materials and equipment used in the Program.” When selecting an ionizer, life cycle costs should be considered, including:
- equipment cost
- installation cost
- operation and maintenance cost

The Desco Bench Top Blower Ionizer is available in the following models:

<table>
<thead>
<tr>
<th>Item</th>
<th>Input Voltage</th>
<th>Power Cord</th>
</tr>
</thead>
<tbody>
<tr>
<td>19500</td>
<td>120VAC</td>
<td>North America</td>
</tr>
<tr>
<td>19520</td>
<td>220VAC</td>
<td>Not Included</td>
</tr>
</tbody>
</table>

Packaging
1 Bench Top Blower Ionizer
1 Power Cord, 6’ (19500 only)
1 Filter and Guard Assembly
1 Certificate of Calibration

Installation
The unit is normally mounted at one end of a workbench or area to be neutralized. It may also be mounted to a wall or shelf. The ionizer's neutralization (discharge) times will be best from approximately 6" to 42" in front of the unit and will drop off as the distance from the unit increases.

Figure 1. Desco Bench Top Blower Ionizer

Figure 2. Area of optimum charge neutralization
Mount the unit in the desired position. You can bolt the stand to a wall or under a shelf as desired. For best results, the unit should be mounted so that no obstructions exist between the output area and the area to be neutralized.

**Figure 3. Wall or shelf mounting of the ionizer**

Set both front panel rocker switches in the “off” position. Connect the IEC plug into the connector on the back panel of the ionizer, press firmly to ensure that the cord is properly attached. Install the power cord into a properly grounded outlet. The ionizer must be grounded for proper operation. Desco recommends the 19219 Ground Hub Continuous Monitor or 98132 AC Outlet Analyzer to check the ground.

**Operation**

Turn on the power switch and adjust fan speed for the desired air flow. Higher air flow will result in a faster neutralization rate.

Aim the unit so that the maximum airflow is directed at the items or area to be neutralized.

The left rocker switch turns on a heater which will raise the temperature of the output air to about 10°F above ambient. The heater is only to offset the chill factor of the moving air. It is not intended to warm the workstation.

If the ionizer is used in a manner not specified by the manufacturer, the protection provided by the ionizer may be impaired.

**Maintenance**

“As with all ionizers, periodic maintenance will be needed to provide optimum performance.” (Reference: IEC 61340-5-2:1 paragraph 5.2.9).

The frequency of monitoring ionizers really depends on how and where they are used. Since the majority of them use a fan to transport the ions to the working area, the cleanliness of the air directly affects their performance over time and how often the emitters should be cleaned.
METHOD 2 (As needed in harsh environments)
This cleaning method will remove all contaminants. Since this method requires direct contact with emitter electrodes, it is critical that the ionizer be unplugged before beginning this cleaning process. **Disconnect power to the ionizer.** Dampen the end of a non-linting cotton swab with isopropyl alcohol. **Alcohol is flammable. Extreme caution should be used when handling any flammable solvent.** Reaching carefully through the grill bars, gently wipe each electrode until clean. Avoid bending any electrodes. If any electrodes become dislodged, nudge them with the tail end of the cleaning brush until they remain no less than 1/4” from any object. **Wait 15 minutes for alcohol to evaporate before plugging in the ionizer.**

**Figure 5. Cleaning the electrodes using a cotton swab dampened with isopropyl alcohol**

ADJUSTMENT
There are no user adjustable or serviceable parts inside the ionizer. Adjusting or dismantling your ionizer may create dangerous conditions and unauthorized modifications will void the product warranty. Servicing should be performed only at the factory, or by a technician trained in high voltage circuits. See warranty section for repair information.

THEORY OF OPERATION
The Bench Top Blower Ionizer employs a safe non-nuclear AC ionization source. AC systems utilize emitter electrodes that are switched rapidly between positive and negative high voltage, usually at the power line frequency (50/60 Hz). The ionizer’s unique Faraday Balance System monitors ion output and automatically adjusts the unit to reach an equilibrium at low offset voltage or balanced ion flow. The ionizer is designed to achieve balance under extreme conditions and is uniquely able to maintain balance in most any environment.

Ions are emitted in an efficient laminar flow. This reduces air turbulence and ion recombination, prolongs cleanliness and increases efficiency. The ionizer’s unique tri-metallic ion emitter electrodes produce a high ion output for rapid charge dissipation.

The Bench Top Blower Ionizer is engineered for efficiency and durability, making this bench top ionizer highly dependable and cost effective.

**Figure 6. Components of the Faraday Balance System**
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.

The comparative efficiency of bench top ionizers 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 the figures below. The performance of the ionizer was measured with the unit positioned as shown, with the fan speed on high and without a filter.

![Diagram of Neutralization (Discharge) Times](image)

**Figure 7. Neutralization (Discharge) Times of item 19500 at 120VAC, 60Hz input**
Figure 8. Neutralization (Discharge) Times of item **19500** at 100VAC, 50Hz input

Figure 9. Neutralization (Discharge) Times of item **19520** at 230VAC, 50Hz input
**Specifications**

**Input:**
- **19500** 120 VAC - 50/60 Hz - 3.0 Amps
- **19520** 220 VAC - 50/60 Hz - 1.5 Amps

**Fuse Type:**
- **19500** Slow blow 5 amp
- **19520** Slow blow 3 amp

**Output:** 4.5kV at 50 - 60 nano amps

**Air Flow:** Adjustable 117 CFM maximum

**Balance Voltage**: ±5V

**Dimensions:** 11" x 9" x 7"

**Weight:**
- **19500** 13 Pounds
- **19520** 16 Pounds

**Cord:**
- **19500** Cord with three wire IEC plug (ground required)
- **19520** Not included

*Desco ionizers meet the ANSI/ESD S20.20 minimum recommended technical requirement range of less than ±50 Volts voltage offset tested in accordance with ANSI/ESD STM3.1. Desco models **19500** and **19520** outperform the requirement providing ±5 Volt auto-balancing.