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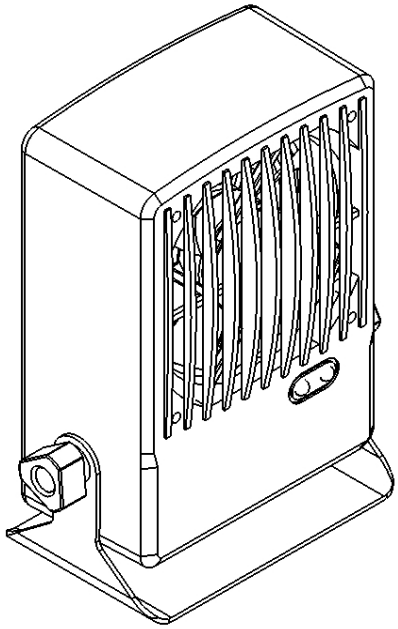
(Rev A, February 2007)

INSTRUCTIONS
Operation/Maintenance

ElimStat Micro
Ionizing Air Blower



Bennett & Bennett's ElimStat Micro Ionizing air blower is designed to control electrostatic charges in semiconductor and electronics manufacturing equipment and for benchtop applications requiring high performance in a small package. Using steady-state DC corona ion technology, the ElimStat Micro Ionizer features self-monitoring to ensure controlled, consistent ion output.

SECTION 1 Description

Bennett & Bennett's ElimStat Micro ionizing air blower is designed to control electrostatic charges in semiconductor and electronics manufacturing equipment and for benchtop applications requiring high performance in a compact package. The ElimStat Micro's small size also makes it easily portable for field service applications where static control is necessary.

Using steady state DC corona ion technology, the ElimStat Micro features self-monitoring to ensure controlled, consistent ion output. Structured airflow from the patented air outlet ensures maximum delivery of ionized air to the target. These features in the design of the Micro enable it to meet the demands of critical semiconductor equipment manufacturers with corona ionization.

The ElimStat Micro uses modular wiring to enable "daisy chaining" of units, up to three units may be daisy chained on a standard power supply. A plug-type terminal block is included for easy wiring if the user desires to hard-wire the unit in place. There is the option of supplying power to the unit through the terminal block where the user wishes to supply power from a 24 VDC machine bus. The terminal block also features relay contact output of the unit's fault alarm for remote fault sensing.

An optional clamp-on spring arm stand is available for benchtop applications requiring elevated positioning, or for locations with a restricted mounting surface area.

SECTION 2 Safety

CAUTION! 

1. Read the complete Operation Manual before operating. Failure to follow instructions may result in damage to the ionizer and/or personal injury.
2. The AC adapter is supplied with a 2- or 3-prong inlet plug, which must be inserted into an appropriate, properly wired wall outlet.
3. A factory-qualified service technician must perform component service and repairs. Please contact Bennett & Bennett's Customer Service for information.

   WARNING! 

4. Keep the unit dry. Do not operate the unit in flammable or explosive atmospheres.
5. Do not insert objects through the unit's intake or outlet grilles while in operation. Damage to the ionizer and/or personal injury may result.

SECTION 3 Features

- Small and compact
- Simple to install and operate
- Quickly controls static
- Variable speed fan
- Inherently balanced ion output

SECTION 4 Specifications

OPERATING SPECIFICATIONS

Ion Balance (offset voltage): 0+/-10 V

Ion Output (discharge time):

Distance	12 in. (305 mm)	18 in. (460 mm)	24 in. (610 mm)	30 in. (760 mm)	36 in. (915 mm)
Fan - High	2	3	5	7	9
Fan - Low	3	4	7	9	12

Offset voltage and discharge time determined as per ANSI/ESD STM3.1 using 6" x 6", 20 pF plate (charged plate monitor). Discharge times are in seconds from 1000 volts to 100 volts.

Input Power: 24 VDC, 250 mA, 6W

Power Supply: Universal 100-240 Vac input (IEC320) / 24 Vdc, 750 mA output, suitable to power up to 3 units.

Operating Temperature: 32°F (0°C) - 122°F (50°C)

Airflow Volume: Fan - High: 42 CFM (1.2 m^3/min)
Fan – Low: 21 CFM (0.6 m^3/min)

Audible Noise: 52 dB(A) at 24 in. (610mm)
48 dB(A) at 39 in. (1m)
High fan speed, measured perpendicular to air outlet.

ON/OFF: Switch on rear panel.
Fan Speed: Variable, recessed adjustment on rear panel.
Indicators: Power: green LED, Fault: red LED, both front panel.
Connectors: Two 4-position, 4-contact (4P4C) modular "handset" connectors for power, may also be used for daisy chaining units.
Modular cable is included with unit.
Modular connector part numbers:
(Amp 5-641334-3, Hirose TM3P-44P, Kobiconn, 154-UL6164)

Connectors:	Plug type terminal block may be used for power and/or fault output connection.. Terminal block is included with unit. Terminal block part numbers: (Weidmuller 1792890000, Phoenix 1803604, Altech 36.305)

MECHANICAL SPECIFICATIONS

Emitter Material:	Polished stainless steel
Enclosure Material:	Reinforced polycarbonate, color: white
Enclosure Dimensions:	3 7/8" W x 5 3/8" H x 2 3/8" D (98mm W x 136mm H x 60mm D)
Unit Weight:	1.1 lb (0.5 kg)
Stand Material:	Nickel plated stainless steel

SECTION 5 Installation

5.1 Unpacking

Carefully remove the equipment from the carton and inspect the contents.

NOTE: If any damage has occurred during shipment, notify the local carrier at once. A report should also be forwarded to Bennett & Bennett, Inc. 1318 Kenton Street, Springfield, OH 45505. See Section 9 (Warranty) for Return Shipment information.

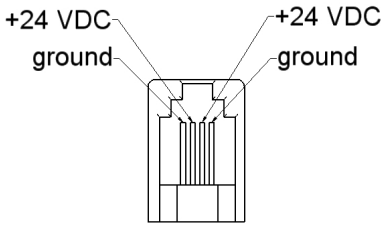
5.2 Installing

The ElimStat Micro Ionizer is designed for portable or permanent operation. Typically, the unit should be positioned such that there is good airflow provided to the critical area. Generally this requires that the unit be within 36" inches of the intended target. The stand provided can be used in a permanent operation by bolting it to a sturdy flat surface such as a wall or shelf. The unit can be mounted horizontally if required.

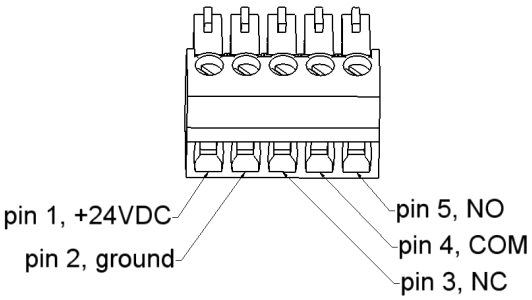
CAUTION! 

5.3 Electrical Connections

The standard AC adapter provided with the ElimStat Micro Ionizer is a universal input AC type adapter with a line cord suitable for the region of operation. This AC adapter may be used to power up to three ElimStat Micro Ionized air blowers by wiring them in series (daisy chain fashion) with the modular cords included. The connectors used on the ElimStat Micro are 4P4C modular "handset" style connectors. For reference, the modular cable carries +24 VDC on the inner two conductors and ground/return is on the outer two conductors., modular connector part numbers are:
Amp 5-641334-3, Hirose TM3P-44P, Kobiconn, 154-UL6164



The ElimStat Micro may also be powered through the plug type terminal block located on the rear panel; +24 VDC goes to pin 1 and the ground/return goes to pin 2. This allows powering of ElimStat Micro ionized air blowers from a 24 volt machine bus. Each Micro draws 250 milliamps so adequate current must be provided. A unit powered through the plug type terminal block may power other ElimStat Micro units wired in series (daisy chain fashion) with the 4P4C modular cords included. Power distributed through the modular cable must be limited to a maximum of 2 amps for safety purposes. Wired in this fashion, the recommended maximum number of units wired in series is 5.

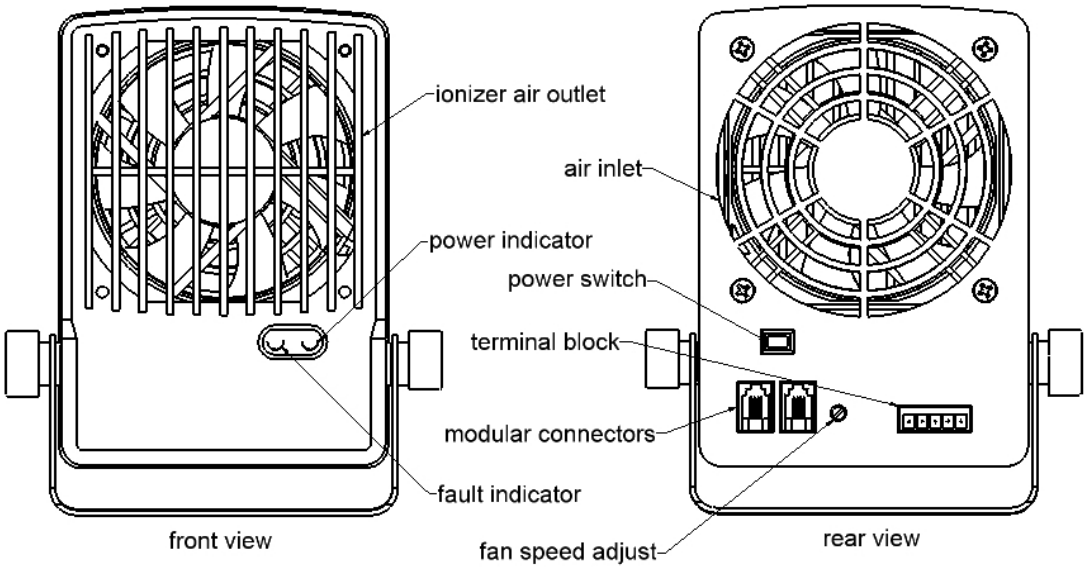


The plug type terminal block also provides relay contact output for the fault alarm. Pin 4 is Common. Pin 5 is Normally Open. Pin 3 is Normally Closed. The relay contacts are rated for a maximum of 1 A at 30 Vdc resistive with a maximum switching voltage of 220 VDC.

A terminal block plug is supplied with the ElimStat Micro.
The terminal block plug type is: Weidmuller 1792890000, Phoenix 1803604, or Altech 36.305.

SECTION 6 Operation

The ElimStat Micro power switch is located on the rear panel of the unit, above the modular cable jacks. The rear panel also has a small hole next to the modular cable jacks that provides access to the recessed fan speed control adjustment. The fan speed may be adjusted with a small screwdriver or trim pot tool. Clockwise rotation provides maximum fan speed, counterclockwise provides minimum fan speed.



The front panel of the ElimStat Micro has two LED indicator lights. The green LED indicates the unit is powered. The red LED is a fault indicator for the high voltage power supply monitoring circuit. The high voltage power supply monitoring circuit also drives the fault alarm relay.

The ElimStat Micro Ionizer produces an ionized air stream that covers a targeted area. The time required to neutralize a static charge on an item in the target area depends on several factors. Two important factors are; distance to ionizer and air velocity. Air ions constantly “neutralize” each other. Positive and negative ions are electrostatically attracted to each other. When they contact, the charge transfers and the ions “recombine”. With high air velocity, the air ions travel further before they “recombine”. Set the fan speed as high as acceptable to provide more rapid static neutralization. For fast neutralizing, the ElimStat Micro should be as close to the target area as practical.

SECTION 7 Maintenance

7.1 Emitter Cleaning

To clean emitters, turn off the ElimStat Micro and unplug it from the power supply. Visually inspect the emitter array for particle or dust accumulation. Moisten a lint free swab with isopropyl alcohol and insert it through the inlet grille. Wipe each emitter clean and clean the emitter hub as necessary to remove accumulation. Allow the alcohol to evaporate completely before returning the ElimStat Micro to service.

7.2 Air Inlet and Outlet Cleaning

The air inlet grille on the rear of the unit and the ionized air outlet should remain clean to prevent restriction of air flow. They can be cleaned with a soft brush or vacuum.

7.3 Ion Output and Balance Check

To test the unit for ion output, the use of a charged plate monitor is recommended. Prior to performing these checks, clean the emitters as described above and allow the unit to run for 10 minutes to allow the ion balance to stabilize. Offset voltage and discharge times can be measured and checked against the Ion Balance and Ion Output tables in Section 4, Specifications. If a charged plate monitor is not available, periodic verification instrumentation may be used but if periodic verification instruments are used it will be necessary to get “baseline” data using the chosen periodic verification instrument.

7.4 Emitter Replacement

To replace emitters, turn off the ElimStat Micro and unplug it from the power supply at the rear panel connector. Lay unit face down on a soft surface. Remove the four Philips head screws at the air inlet on the rear panel. Lift the rear panel out of the enclosure and set to one side (Note how the black plastic divider fits between the ionizer and circuit boards during disassembly). The ionizing hub contains sockets for the ion emitting pins. Carefully remove the ion emitters by pulling them straight out from the ionizer hub. Push new ion emitters into the sockets, make sure all sockets have emitters and all emitters are fully inserted into their sockets. Replace the rear panel on the enclosure while guiding the black plastic divider back into place. Ensure that the power switch and power jacks are properly fitted through the openings on the rear panel. Secure the rear panel with the four Philips head screws, do not over tighten the screws. Test unit and return to service.

7.5 Troubleshooting / Diagnostics

This information provides a quick troubleshooting reference for the ElimStat Micro ionizing air blower. Should any of these possible solutions not solve the problem, contact Bennett & Bennett.

PROBLEM	***CAUSE***	***SOLUTION***
UNIT FAILS TO OPERATE (NO GREEN INDICATOR LIGHT)	AC ADAPTER NOT CONNECTED	CHECK ALL ELECTRICAL CONNECTIONS
	FAULTY AC ADAPTER	REPLACE AC ADAPTER
UNIT FAILS TO OPERATE (GREEN INDICATOR LIGHT ON)	INTERNAL FAULT	RETURN UNIT FOR REPAIR
RED FAULT INDICATOR ILLUMINATES	DIRTY EMITTER HUB	CLEAN EMITTER HUB AS DESCRIBED ABOVE
	INTERNAL HV FAULT	RETURN UNIT FOR REPAIR
EXCESSIVELY LONG STATIC DISCHARGE TIMES	DIRTY EMITTERS	CLEAN EMITTERS AS DESCRIBED ABOVE
	WORN EMITTERS	REPLACE ION EMITTERS
ION BALANCE OUT OF SPECIFICATION	DIRTY EMITTERS	CLEAN EMITTERS AS DESCRIBED ABOVE
	WORN EMITTERS	REPLACE ION EMITTERS
	GROUNDED METAL NEAR IONIZED AIR OUTLET	MOVE METAL AWAY FROM OUTLET OR MOVE OUTLET AWAY FROM METAL

SECTION 8 Replacement Parts / Part Numbers

Part Number	Description
4012398	ElimStat Micro (with 100/120VAC Japan / North America power supply)
4012397	ElimStat Micro (no power supply)
5051406	ElimStat Micro power supply only (100/120VAC Japan / North America)
4371099	Emitter, standard stainless steel (6 required)
4370760	Emitter, long life tungsten (6 required)
4520764	Modular cable, 4P4C, 3’ long
4520767	Modular cable, 4P4C 6’ long
5051141	Articulated arm kit

SECTION 9 Warranty

Bennett & Bennett warrants its products to be free of defects in components, workmanship, or materials for a period of one year from date of purchase. This warranty does not apply to any physical or electrical damage caused by misuse, abuse or negligence (such as any modifications made to the unit or service work done by any other than Bennett & Bennett authorized technicians). Any unit with altered or removed serial number is ineligible for warranty.

Bennett & Bennett will not be liable for loss or damage due directly or indirectly to an occurrence or use for which the product is not designed or intended. In no event shall Bennett & Bennett be liable for incidental or consequential damages except where state or regional laws override.

This warranty extends to the original purchaser and is not transferable. No person, agent, distributor, dealer or company is authorized to change, modify, or amend the terms of this warranty in any manner whatsoever.

All products returned must have an "RA" (Return Authorization) number regardless of warranty status. Call Bennett & Bennett for an assigned RA number.

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