Neutralising Ion Python and Hand Gun Operation and Maintenance
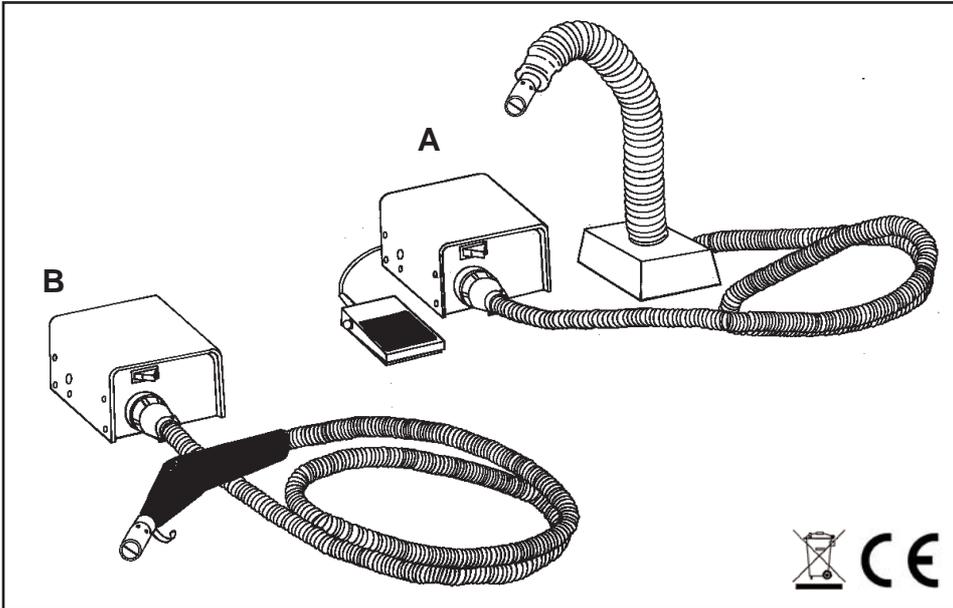
Made in America

Figure 1. Vermason Ion Python Air Nozzles
A. Ion Python (Controller and Foot Switch) B. Hand Gun (Controller with Hose)

Description

The Vermason Item No. 200004 Ion Python Air Nozzle and Item No. 200045 Neutralising Hand Gun quickly and effectively neutralise bulk static charges and aid in controlling contamination by dislodging dust and debris attracted by static electricity. Attached to compressed air, the airflow may be easily adjusted from a gentle stream to a powerful blast. These units are designed for use in applications and areas where ElectroStatic Attraction contamination create manufacturing or handling problems (Ref: ESD Handbook TR 20.20 paragraph 5.3.6.5.2.4 Point of Use Ionization). The units meet or exceed the recommended technical requirements of ANSI/ESD S20.20 tested in accordance with ANSI/ESD S3.1.

The Ion Python Air Nozzle is designed for point-of-use fixed mounting applications, while the Ion Python Hand Gun is a more portable unit. The air hose of both units is designed to be easily disconnected or replaced by the user. Replacement nozzle/air hose assemblies for the Ion Python Air Nozzle are sold separately as Vermaon Item #200050. Replacement nozzle/air hose assemblies for the Ion Python Hand Gun are sold separately as Vermason Item #200065.

"Ionisers should be considered as a method for charge neutralization in cases where grounding cannot be achieved." "Air ionization can neutralise the static charge on insulated and isolated objects by producing separate charges in the molecules of the gases of the surrounding air. When a static charge is present on objects in the work environment, it will be neutralised 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." (EN 61340-5-2 paragraph 5.2.9)

"As with all ionisers, periodic mainten-ance will be needed to provide optimum performance." "The following list contains important points for the selection process:- charge neutralization; - discharge time; - ion balance; - product sensitivity; - solution to static problem; - environmental considerations, - airflow; - physical dimensions." (EN 61340-5-2 paragraph 5.2.9.2)

Both the Ion Python and Neutralising Hand Gun are NIST calibrated. They come equipped with universal IEC cord connectors.

NOTE: These units are not recommended for continuous use.

IONISER SELECTION

ANSI/ESD S20.20 paragraph 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 ioniser life cycle costs should be considered including: equipment cost; installation cost; and operation and maintenance cost.

Air Requirements

Always supply the Ion Python and Hand Gun with filtered, dry noncombustible gases, such as compressed shop air or nitrogen. (If nitrogen is used, the tip will need to be replaced and the unit recalibrated. This **MUST** be done by the factory.) If the air is not dry, damage to the equipment may result and the warranty will be voided. Dirty air can introduce moisture and oil, contaminating the units' emitter assembly along with the materials to be cleaned or neutralised. Filters must therefore be used at all times upstream of the air nozzle. A water trap-type pre-filter should be used in conjunction with an oil coalescing-type filter. Also drain all moisture traps regularly to prevent moisture in the line. Several drainings per day may be necessary, especially in areas of high humidity.

The Ion Python and Hand Gun may be operated over a range of 30 PSI to 100 PSI. The specific pressure needed will depend upon the application. Pressures exceeding 100 PSI are not recommended since these higher pressures are detrimental to effective ion production. An air pressure setting of 60 PSI is recommended. Use the needle valve located on the back of the controller to properly adjust the air flow.

Air Supply Connection

Turn off air at regulator (or compressor). Insert the brass male connector (1/4" tubing to 1/8" pipe thread) into an available port on the regulator. If all ports are being used, a "T" or "+" may be added to create more ports. Connect the 1/4" tubing to the male connector on the needle valve on back side of the unit, following the instructions given below.

To connect tubing or filter to quick connect fitting:

Cut end of plastic tubing square and clean. Push against the collar with thumbnail. While holding collar in, push tubing into the fitting until it bottoms out completely.

To release tubing or filter from quick connect fitting:

Push against the collar with thumbnail. While holding collar in, push tubing inward slightly, then pull tubing out.
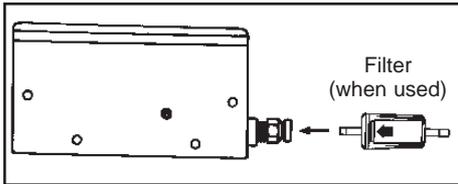
IMPORTANT NOTE: User should exercise caution when using any compressed air device.

Figure 2. Connecting the filter (Ion Python only)

Electrical Requirements

The Ion Python and Neutralising Hand Gun must be connected to a properly grounded receptacle for the units to operate properly. It is recommended that the AC outlet be checked for proper wiring and grounding.

Do not under any circumstances remove the ground pin from the plug of these units.

NOTE: Grounding of these units is necessary not only to ensure that they operate properly, but to eliminate the possibility of an electrical shock.

Operation

Turn on unit with switch on the front panel. The green light indicates that the air nozzle is ready for use. Point nozzle at object to be cleaned or neutralised.

When using the Ion Python, actuate foot pedal switch to initiate the flow of air and neutralising ions. Best results are normally obtained when holding the nozzle within .15cm to 45cm of the item being neutralised.

For the Neutralising Hand Gun, push button on the nozzle body to initiate the flow of air and neutralising ions. Best results are normally obtained when holding the nozzle within 61cm or 91cm of the item being neutralised; hold the nozzle closer when required.

NOTE: Unit is not designed for continuous duty.

A needle valve is located on the back of the unit for fine adjustments to the air flow, or for shutting off the air to the nozzle. Airflow on the unit can be adjusted from a gentle blow to a strong blast, allowing for use in most applications. Do not obstruct the air jet with fingers or other objects. Do not force any object into the air jet hole; this action can easily damage the emitter pin and prevent the controller from producing the ionization necessary for neutralising static charges.
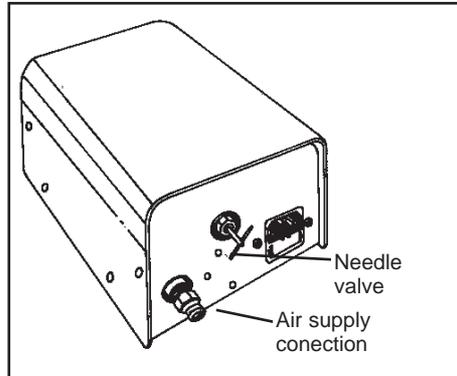

Figure 3. Airflow adjustment valve.

The ion balance is affected by many factors, such as distance, air flow, humidity, and emitter contamination. Therefore, before using this device around components and assemblies which are highly sensitive to ESD, it is recommended that the user thoroughly evaluate the application prior to its use. Avoid sharply bending or crushing the black convoluted tubing under feet, rolling chairs or other furniture.

IMPORTANT NOTE: These air nozzles are not explosion proof. Do not use in environments where volatile materials are present.

Vermason solid-state electronic equipment is compact and rugged but should be treated as sensitive electronic equipment. With proper installation and a continued preventive maintenance program you will ensure the proper performance of the unit.

Theory of Operation

The Ion Python and Neutralising Hand gun employ high voltage AC to create a balanced ion field. AC systems utilize emitters that are switched rapidly between positive and negative high voltage, usually at the power line frequency (50/60 Hz). The emitter is located at the end of the nozzle. This emitter produces large amounts of positive and negative ions, which mix with the air supply and create a highly effective neutralising field. Any material within this field will be neutralised rapidly. The air nozzles also eliminate contamination by dislodging dust and debris which is attracted to a material's surface by static charges. Once static charges are neutralised, dust particles

and other forms of contamination are freed and carried away by the air stream. Vermason ionisers meet the ANSI/ESD S20.20 minimum recommended technical requirement range of less than ±50 volts voltage offset tested in accordance with ANSI ESD S3.1. Air Nozzle Ionisers typically can provide ±20 volt offset balance.

Maintenance

"Periodic verification of ionisers is performed to provide continuing indication of required ioniser performance. The more critical the ioniser application, the more important it is to verify that the ionisers are working correctly. Periodic verification testing is most often performed under actual use conditions. In general, all ionisers should be checked, rather than a random sample." ESD SP3.3 Periodic Verification of Air Ionisers, A2.1

"Periodic verification procedures should be a part of the initial acceptance process to provide baseline data for comparison with future measurements. A schedule should be established for periodic verification testing." ESD SP3.3 Periodic Verification of Air Ionisers, section 7

"Ionisers should be tested for discharge time and balance after they have been installed in the use location. The time intervals for subsequent measurements will depend on the users requirements." ESD Handbook TR 20.20 paragraph 5.3.6.6.5

These units need very little maintenance. In order to maintain the optimum performance of your unit, the following maintenance procedures must be performed on a regular basis.

Make sure that the air supply is clean and free of contamination and moisture. Drain compressor tank and filters periodically. The filters may require draining several times daily, depending on your compressed air system.

The fuse may be replaced by removing the power cord at the back of the unit and opening the fuse box at the IEC receptacle. The controller uses a 1 amp fast acting fuse. **For safety, do not use other ratings.**
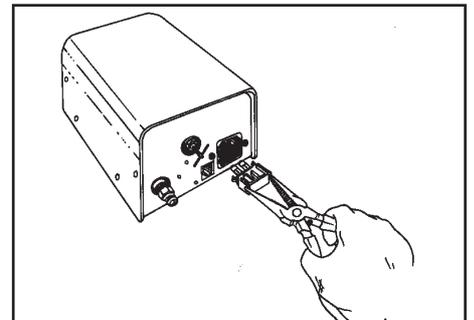

Figure 4. Replacing the fuse.

Do not attempt to perform any repairs or adjustments on your Vermason equipment except for those covered in the operation manual. Self-made repairs could create a hazard and will void the warranty.

Replacing the Air Nozzle Assembly

The air nozzle and hose assembly is designed to be removed or replaced by the user in the event of damage or wear. To replace the assembly, simply unscrew the collar at the base of the hose and gently disconnect the connector from the receptacle.
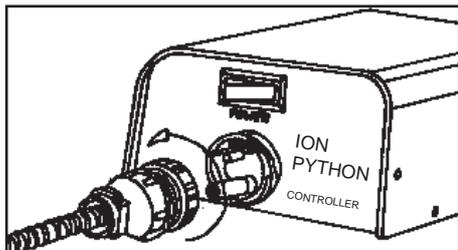

Figure 5. Replacing air nozzle assembly

To replace the nozzle assembly simply repeat the process in reverse.

NOTE: Make sure the fittings inside the connector are properly aligned with their receptacles before tightening the threaded collar.

Replacing the Air Filter of the Ion Python

Periodic replacement of the air filter is recommended for optimum performance of the ioniser. Examine the filter for any evidence of contamination. The filter will turn red if there is any oil contamination. If there has been moisture build-up, there will be a change in air volume or a brownish color to the filter. If either of these conditions exist, you should replace the filter by unsnapping connectors. Depress air line connectors allowing removal of filter. The filter replacement is sold as Vermason item #200070 (two filters to a package). Be sure to observe the flow direction on filter when installing a replacement.
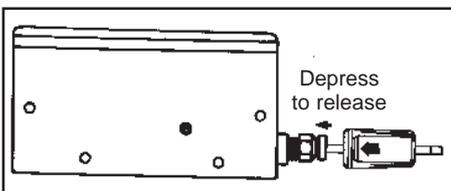

Figure 6. Air filter replacement.

Installation of the Controller and Ion Python Attachment

The mounting slots on the bottom of the controller allow for easy mounting of the base. Install screws either on a wall or bench. Using the mounting slots, place controller on the screws for secure mounting of the unit. Mounting the controller underneath a bench or on a wall saves valuable bench space. After mounting the unit, a locking screw is provided on the back of the unit to prevent accidental removal.
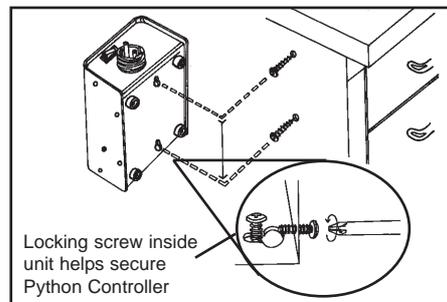

Locking screw inside unit helps secure Python Controller

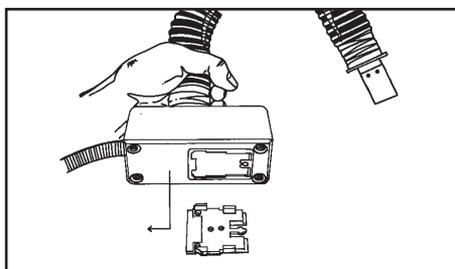*Figure 7. Installing controller to bench.*

Figure 8. Installation of Ion Python to bench.

Once you have installed the base of the controller, you can now install the Ion Python Attachment to the bench. A bracket is included with the unit to facilitate easy mounting. Install bracket to the bench. Position the base of the Ion Python over the bracket and slide it on. Position the Ion Python so that the ion flow is focused on the equipment or area to be ionised.

Neutralization Efficiency (Discharge Time)

The comparative neutralization efficiency of ionisers is determined by a standard test published by the ESD Association Standard 3.1. The decay rates measured using this standard are shown in the chart below. This performance was measured with the air nozzle at a distance of 6" from the charged plate and utilizing an air pressure of 30 PSIG.

Rate per ANSI/ESD S3.1

Test Pressure	Rate
30 PSI	< 5 seconds

Charge Time Constants

Notes: 1) Times are from 1,000 volts to 100 volts and -1,000 to -100 volts.

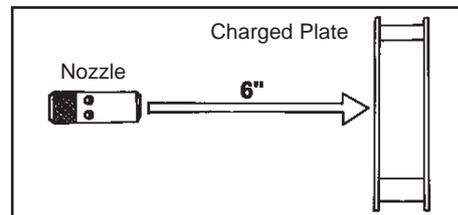2) The air nozzle's air stream is perpendicular to the charged plate.

Figure 10. EOS/ESD S-3.1 decay time test set up.

Testing and Calibration

Ionisers are tested and calibrated using a charged plate analyzer or an Ionization Test Kit (see Vermason Item #222670). A detailed test procedure is outlined in ESD Association's Standard ESD S3.1 and ESD SP3.3 which can be obtained directly from the ESD Association, 7902 Turin Road, Suite 4, Rome, NY 13440-2069, (315) 339-6937.

Adjustment

Offset voltage balance adjustment can be done by using the side adjustment potentiometer found on the side of the unit. Point ion stream to nomal use setting and adjust ionization output for best and most efficient balance. Servicing should be performed only at the factory, or by a technician trained in high voltage circuits. See warranty section for repair information.
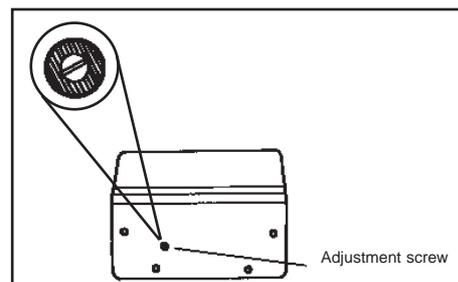

Adjustment screw

Figure 11. Balance Adjustment.

Specifications

Input Voltage:	220 VAC, 50/60 Hz
Amperage standby:	<50 milliamps
Amperage in use:	<400 milliamps
Fuse:	2ea 1 amp, 5 x 20mm, fast acting
Power Usage:	2.5 watts on, 25 watts in use
Power Cord:	Not included
Python:	One-piece Delrin
Air Gun:	Two-piece molded ABS
Hose Length:	
200004	1.5 metres
200045	2.1 metres
Control Box:	13cm H x 16cm W x 18cm L
Weight:	5 kilograms
Air Usage:	3.5 CFM @ 30 PSI
Recommended PSI:	30 PSI to 100 PSI
Air fittings:	6.35mm OD tubing with 3.2mm NPT with adjustable needle valve.

Health

There are no known health risks associated with our devices. The emitters work at about 4-6 kV and can create ozone, but there have been no significant measurement of ozone from our emitter sets, as all our existing units test well below the OSHA limit of 0.05 ppm ozone. For additional safety information, see "Dispelling an Old Myth" written by William Metz of Hewlett-Packard published in Evaluation Engineering magazine, September 2001.

- Indoor use
- Altitude up to 2000m
- Temperature 5°C to 40°C
- Maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C
- Mains supply voltage fluctuations up to ±10% of the nominal voltage
- Transient overvoltages typically present on the mains supply
- Applicable rated pollution degree is 2
- Degree of ingress protection is IP10

UNIT C, 4TH DIMENSION, FOURTH AVENUE, LETCHWORTH, HERTS, SG6 2TD UK
Phone: 0044 (0) 1462 672005, Fax: 0044 (0) 1462 670440 • e-mail: Service@Vermason.co.uk, Internet: Vermason.co.uk

TB-7530 Page 4 of 4   © 2008 Vermason