Neutralising Ion Vector and Hand Gun Operation and Maintenance

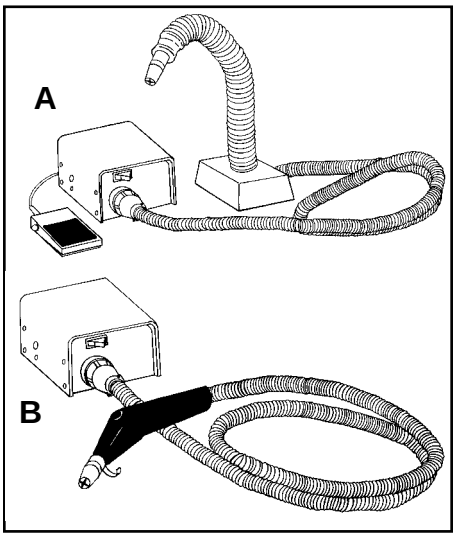

Figure 1. Charleswater Europe 92100 Ion Vector Air Nozzles
A. Ion Vector (Controller and Foot Switch)
B. Hand Gun (Controller with Hose)

Description

The Charleswater Europe 92100 Ion Vector and 92105 Neutralising Hand Gun are ready-to-use units designed for use in applications and areas where static can create manufacturing or handling problems. The units quickly and effectively neutralise bulk static charges and aid in controlling contamination by dislodging dust and debris attracted by static electricity. Airflow may be easily adjusted from a gentle stream to a powerful blast.

The 92100 Ion Vector Air Nozzle is designed for point-of-use fixed mounting applications, while the 92105 Ion Vector 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 Vector are sold separately as Charleswater Europe Item #92115. Replacement nozzle/air hose assemblies for the Hand Gun are sold separately as Charleswater Item #92118 or 92120.

Both the Ion Vector and Neutralising Hand Gun have an IEC receptacle socket. They operate on 220 VAC 50 Hz.

NOTE: These units are not recommended for continuous use.

Air Requirements

Always supply the Ion Vector 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 unit's 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 Neutralising Ion Vector and Hand Gun may be operated over a range of 5 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 (6.35mm tubing to 3.2mm 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 6.35mm tubing to the male connector on the needle valve on back side of the unit, following the instructions given below.

To connect tubing 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 from quick connect fitting:

Push against the collar with thumbnail. While holding collar in, push tubing inward slightly, then pull tubing out.

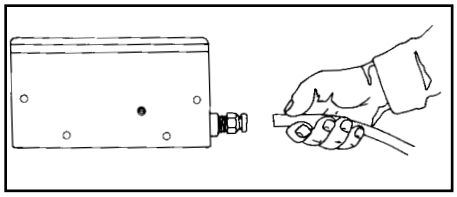

Figure 2. Connecting & disconnecting tubing.

IMPORTANT NOTE: User should exercise caution when using any compressed air device.

Electrical Requirements

The Ion Vector 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 the 92100 or 92105.

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 Vector, actuate foot pedal switch to initiate the flow of air and neutralising ions. Best results are normally obtained when holding the nozzle within 30 or 60 centimeters 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 60 or 90 centimetres of the item being neutralised; hold the nozzle closer when required.

NOTE: Unit is not designed for continuous duty.

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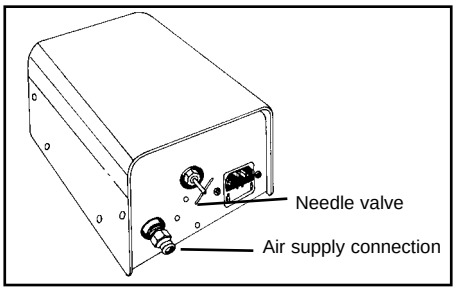

Figure 3. Airflow adjustment valve.

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.

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 evaluates the application prior to its use. Avoid sharply bending or crushing the black flexible 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.

Charleswater Europe 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 Vector and Neutralising Hand gun employ high voltage AC to create a balanced ion field. 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.

Maintenance

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.**

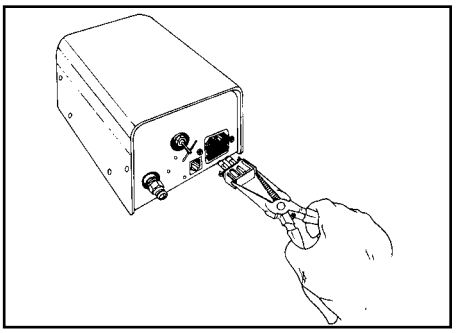

Figure 4. Replacing the fuse.

Do not attempt to perform any repairs or adjustments on your Charleswater Europe 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.

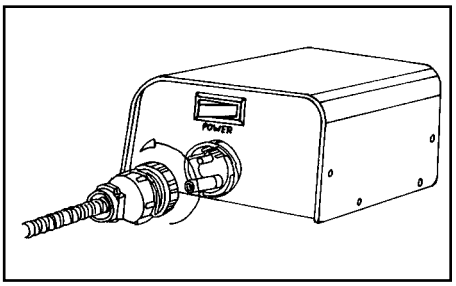

Figure 5. Replacing air nozzle assembly

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 Vector

Periodic replacement of the air filter is recommended for optimum performance of the ioniser. Compress outer sleeving away from the nozzle housing. 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 colour to the filter. If either of these conditions exist, you must replace the filter by unsnapping connectors as shown in the diagram. Use needle nose pliers as shown to depress air line connectors allowing removal of filter. The filter replacement is sold as item #92119 (two filters to a package). Be sure to observe the flow direction on filter when installing a replacement.

Filter efficiency: 90% - 99.99% at 0.1 micron, 125PSIG pressure rating up to 14.6 SCFM flow rate.

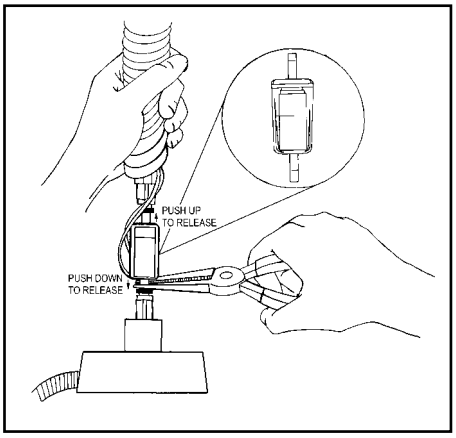

Figure 6. Air filter replacement.

Installation of the Controller and Ion Vector 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.

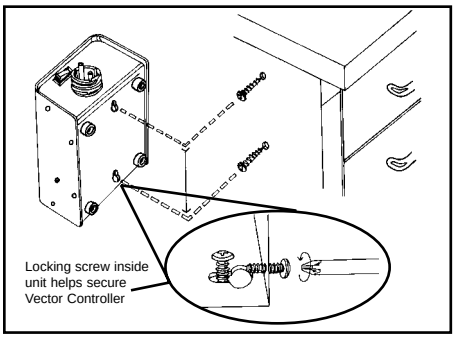

Figure 7. Installing controller to bench.

Once you have installed the base of the controller, you can now install the Ion Vector 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 Vector over the bracket and slide it on. Position the Ion Vector so that the ion flow is focused on the equipment or area to be ionised.

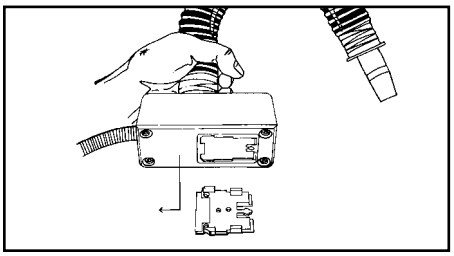

Figure 8. Installation of Ion Vector to bench.

The 92100 can also be used in areas where a conveyor is used to transport equipment. By adding an 92117 photoelectric sensor you can protect and neutralize moving objects without the use of an operator. The photoelectric sensor will automatically detect any moving objects that pass between the sensor and the reflector.

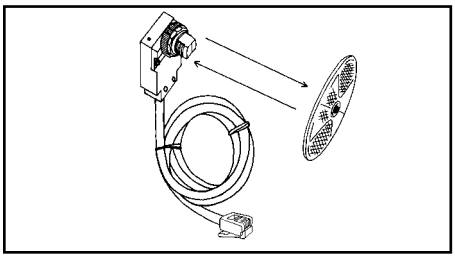

Figure 9. Photoelectric sensor and reflector.

Neutralisation Efficiency (Decay Time)

The comparative neutralisation 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 15cm from the charged plate and utilizing an air pressure of 30 PSIG.

Decay Rate per EOS/ESD S-3.1

Test Pressure	**Decay Rate**
30 PSIG	<1 seconds

Charge Decay Time Constants

Notes: 1) Decay times are from 5000 volts to < 500 volts.
2) The air nozzle's air stream is perpendicular to the charged plate.

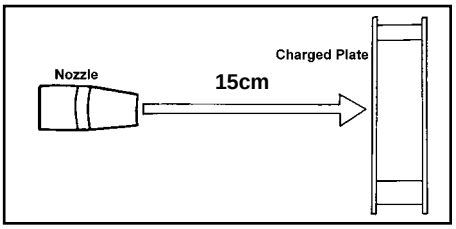

Figure 10. EOS/ESD S-3.1 decay time test set up.

Testing and Calibration

Ionisers are tested and calibrated using a charged plate analyser. For proper testing we recommend using our 99096 charged plate analyser and the procedure outlined in ESD Association's Standard 3.1. This standard can be obtained directly from the ESD Association, 7902 Turin Road, Suite 4, Rome, NY 13440-2069, (315) 339-6937.

Adjustment

Balance adjustment can be done by using the side adjustment potentiometer found on the side of the unit. Point ion stream to normal use position 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.

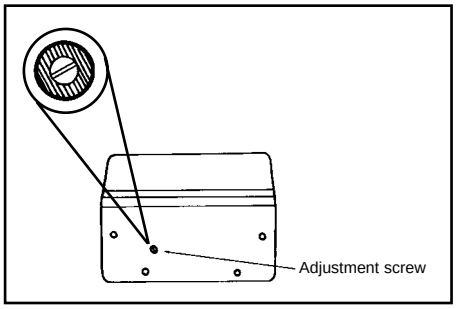

Figure 11. Balance Adjustment.

IMPORTANT: These units are designed to work with the live and neutral connections on the mains plug, being the correct polarity. On some European plug sockets the polarity can be either way round. Before plugging in your Ioniser, please check the polarity of your mains socket, and ensure that the live and neutral match the live and neutral pins on the mains socket.

We cannot accept liability for Ionisers where the unit has been plugged into the mains socket, with the polarity reversed.

Please note that these units do require a properly grounded wall socket to function correctly.

Specifications

Input Voltage:	220 VAC, 50 Hz
Amperage on:	20 milliamps
Amperage in use:	200 milliamps
Fuse:	2ea 1 amp, 5 x 20mm, fast acting
Power Usage:	2.5 watts on, 25 watts in use
Vector:	One-piece Delrin
Air Gun:	Two-piece molded polyurethane
Hose Length:	
92100	1.5 metres
92105	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:	0 to 100 PSI
Air fittings:	6.35mm OD tubing with 3.2mm NPT with adjustable needle valve.

Limited Warranty
Charleswater Europe expressly warrants that for a period of one (1) year from the date of purchase, Charleswater Europe Ionisers will be free of defects in material (parts) and workmanship (labor). Within the warranty period, a unit will be tested, repaired or replaced at Charleswater Europe's option, free of charge. Call Customer Service at 00 44 (0) 1892-665313 for a Return Material Authorisation (RMA) and proper shipping instructions and address. Include a copy of your original packing slip, invoice, or other proof of date of purchase. Any unit under warranty should be shipped prepaid to the Charleswater Europe factory. Warranty repairs will take approximately two weeks.

If your unit is out of warranty, Charleswater Europe will quote repair charges necessary to bring your unit up to factory standards. Call Customer Service at 00 44 (0) 1892-665313 for a Return Material Authorisation (RMA) and proper shipping instructions and address. Ship your unit prepaid to the Charleswater Europe factory.

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 WHICH ARE 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
Electronic ionisers use high voltage corona discharge and should not be used in or near flammableor explosive environments. In no event will Charleswater Europe or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.

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