

Ion Python Compressed Air Ioniser Installation, Operation and Maintenance



Made in the
United States of America



Figure 1. Desco [19588](#) Ion Python Compressed Air Ioniser

Description

The Desco Ion Python Compressed Air Ioniser is a ready-to-use unit designed for use in applications and areas where static can create manufacturing or handling problems. These 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. These units are designed for use in applications and areas where electrostatic attraction contamination create manufacturing or handling problems (Ref: IEC TR 61340-5-2, paragraph 5.3.3.4.6.12 Point of Use Ionisation). The Ion Python meets or exceeds the recommended technical requirements of IEC 61340-5-1 tested in accordance with IEC 61340-4-7.

Ionisers are useful in preventing electrostatic charge generation, electrostatic discharge, electrostatic attraction, as well as preventing equipment latch-up and safety related shock. Paragraph 5.3.4.2 Insulators in IEC 61340-5-1: "If the measured electrostatic field or surface potential exceeds the stated limits, ionization or other charge mitigating techniques shall be used."

Ionisation is used to neutralise charges on process necessary insulators and isolated semiconductors. 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. Ionisation is not effective on items that have large capacitance, like people and carts; however, ionisers should be considered as a method for charge neutralisation in cases where grounding cannot be achieved.

Air ionisation 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 an electrostatic charge is present on objects in the work environment, it will be neutralised by attracting opposite polarity charges from the ionised air. Note that ionisation 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).

The Ion Python is NIST calibrated. It comes equipped with universal IEC cord connectors.

NOTE: These units are not recommended for continuous use.

The Ion Python and its accessories are available in the following item numbers:

Item	Description
19588	Ion Python Compressed Air Ioniser
92115	Flexible Arm Attachment
92118	Replacement Hand Gun Attachment
92119	Air Filters, 2-Pack
200220	Power Cord, Europe
200225	Power Cord, UK

Packaging

- 1 Ion Python Controller
- 1 Hand Gun Attachment
- 1 Certificate of Calibration

Installation

Air Requirements

Always supply the Ion Python 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. Contact customer service at +44 (0) 1462 672005). 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 Neutralising Ion Python 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.

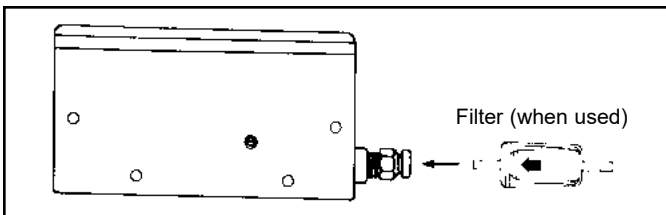


Figure 2. Connecting the optional [92119](#) air filter

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.

Mounting the Controller

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.

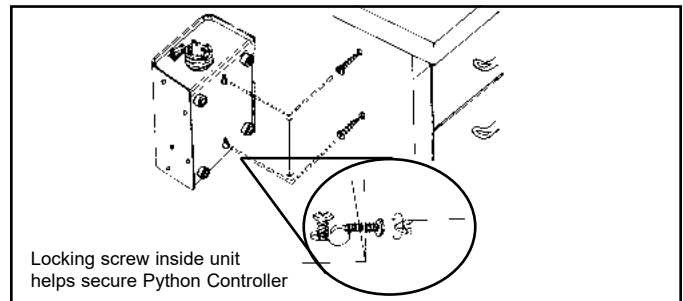


Figure 3. Mounting the controller to a workbench

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.

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 2 or 3 feet (61 cm or 91 cm) of the item being neutralised; hold the nozzle closer when required.

NOTE: These units are not recommended for continuous use.

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 ionisation 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 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.

Desco 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 programme you will ensure the proper performance of the unit.

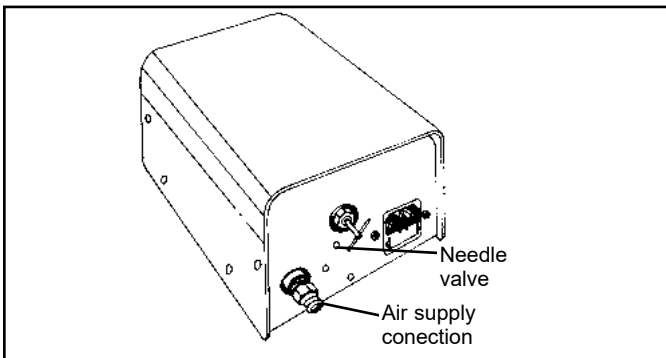


Figure 4. Airflow adjustment valve

Theory of Operation

The Ion Python and Neutralising Hand Gun employs high voltage AC to create a balanced ion field. AC systems utilise 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 are 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. Desco Europe ionisers meet the IEC 61340-5-1 minimum recommended technical requirement range of less than ± 35 volts voltage offset tested in accordance with IEC 61340-4-7. Air Nozzle ionisers provide ± 20 volt balance.

Maintenance

The frequency of monitoring ionisers 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.

EIA-625 recommends checking ionisers every 6 months, but this may not be suitable for many programs particularly since an out-of-balance may exist for months before it is checked again. IEC TR 61340-5-2 paragraph 5.3.3.4.6.16.1 General considerations for maintenance and cleaning, paragraph 5.3.3.4.6.16.1.1 Introductory remarks states: "All ionization devices will require periodic maintenance for proper operation. Maintenance intervals for ionizers vary widely depending on the type of ionization equipment and use environment. Critical clean room use will generally require more frequent attention. It is important to set up a routine schedule for ionizer service. Routine service is typically required to meet quality compliance verification requirements."

Under normal conditions, the ioniser will attract dirt and dust (especially on the emitter electrodes). To maintain optimum performance, cleaning must be performed on a regular basis. The electrodes should be cleaned at least every six months. However, more frequent cleaning may be required if used in environments with more contaminants.

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.

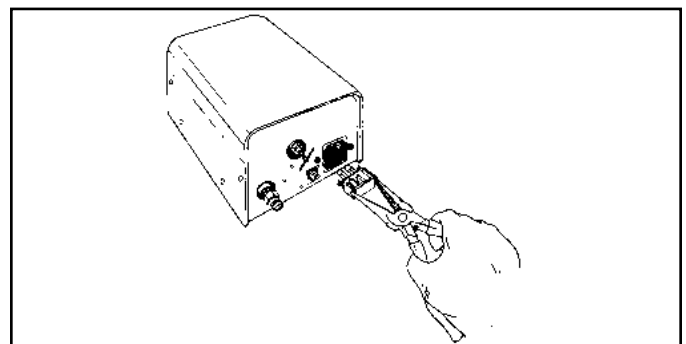


Figure 5. Replacing the fuse

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

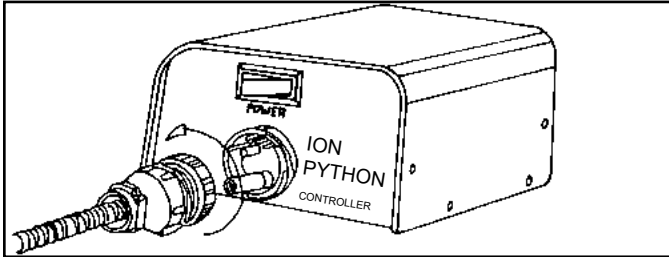


Figure 6. Replacing the hand gun attachment

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. Compress outer sleeving away from the filter 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 should replace the filter by unsnapping connectors. Depress air line connectors allowing removal of filter. The filter replacement is sold as Desco Europe item [92119](#). Be sure to observe the flow direction on filter when installing a replacement.

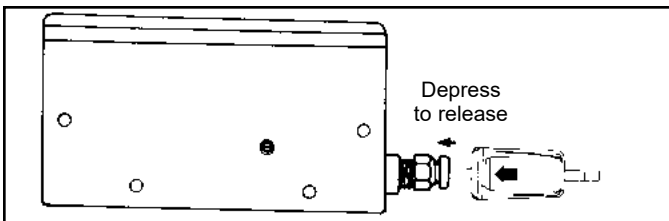


Figure 7. Replacing the air filter

Neutralisation Efficiency (Decay Time)

The comparative neutralisation efficiency of ionisers is determined by a standard test published by IEC 61340-4-7. 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" (15 cm) from the charged plate and utilising an air pressure of 30 psi.

Decay Rate per IEC 61340-4-7

Test Pressure	Decay Rate
30 psi	2 seconds

Charge Decay Time Constants

1. Decay times are from $\pm 1,000$ volts to ± 100 volts.
2. The air nozzle's air stream is perpendicular to the charged plate.

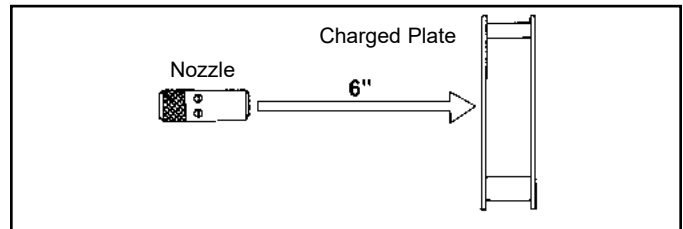


Figure 8. IEC 61340-4-7 decay time test setup

Calibration

Test using a version of IEC 61340-4-7. Observe and record offset voltage (float voltage) in voltage, measure of discharge time for +1000 volts to +100 volts and -1000 volts to -100 volts in seconds.

Equipment and tools used

- Charged Plate Monitor (CPM)
- Medium sizes insulative flat head screw driver

Set-up

1. Refer to IEC 61340-4-7. Test should be performed on static dissipative worksurface. Testing technician and worksurface needs to be properly grounded.
2. Refer to figure 8 - Test location for compressed gas - Guns or nozzles on page 13. CPM needs to be 6" from the center of the CPM plate to worksurface. Tip of air nozzle needs to be at 6" (15 cm) away from surface of CPM plate.

Testing

Lab environment should be at 75 °F at ± 5 °F (23.9 °C at ± 5 °C), relative humidity at 45 % at ± 5 % RH. Observe offset voltage for no less than 10 seconds before recording.

	Specification	Recorded value
Balance	25 V	
Discharge time (+1,000 V to +100 V)	≤ 2 s	
Discharge time (-1,000 V to -100 V)	≤ 2 s	

Adjustment

Adjustments to the offset voltage could be made by using an insulative flat head screw. Balancing pot is located on the side of controller, where the white plastic cap is covering it.

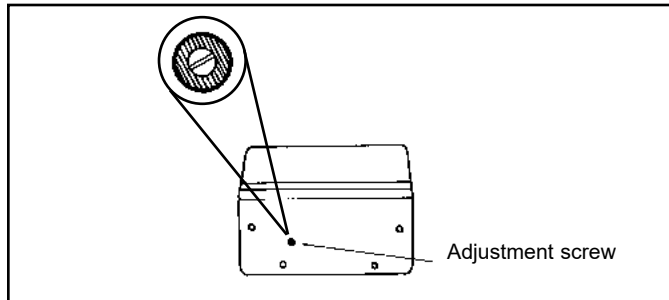


Figure 9. Balance adjustment trimpot

Specifications

Input voltage and frequency	220 VAC, 50/60 Hz
Neutralisation (discharge) time at 6" (15 cm), 30 psi	< 2 seconds
Balance at 15 cm, 30 psi	± 25 V
Power consumption	2.5 W (standby) 25 W (in-use)
Amperage	< 50 mA (standby) < 400 mA (in-use)
Fuse	1 A, 5 x 20 mm, fast-acting (2 each)
Ion emission	AC
Emitter point	Stainless steel
Ozone	< 0.005 ppm
Air hose	ABS plastic, 2 m length
Gas input	30 to 100 psi, Clean Dry Air (CDA)
Gas connection	1/4" O.D. tubing with 1/8" NPT with adjustable needle valve
Gas consumption	3.5 CFM @ 30 psi
Mounting	Metal mounting plate attaches to back of console
Enclosure	Powder coated steel and stainless steel
Dimensions (console)	5.1" x 6.4" x 7.1" (130 mm x 163 mm x 180 mm)
Weight (console)	11 lbs (5.0 kg)
Certifications	Intertek, CE
Country of origin	United States of America

Limited Warranty, Warranty Exclusions, Limit of Liability and RMA Request Instructions

See the Desco Europe Warranty -

DescoEurope.com/Limited-Warranty.aspx