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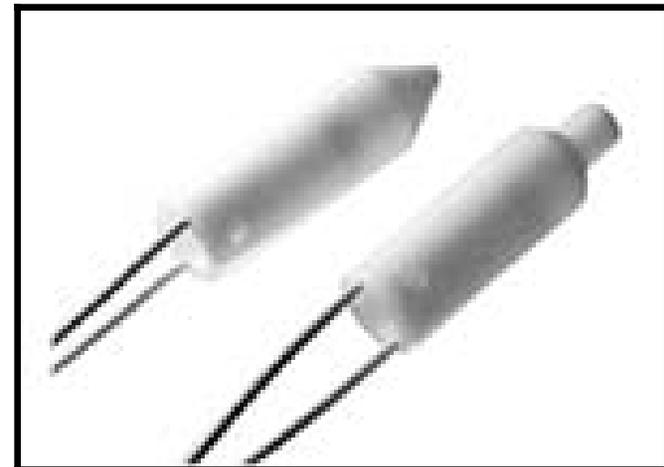


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## **INSTRUCTIONS** **Owner's Manual**

### **Ionizing Air Nozzles** **Models AN-2 and AN-6**



## Warranty

SIMCO warrants that its products have been manufactured in conformity with all applicable U.S. laws, and that during the warranty period, its products will be free from defects in workmanship and material. The warranty period is one year. Minor deviations from specifications or descriptions shown in SIMCO product literature or service manuals which do not affect the performance of the product are not considered to be defects in workmanship or materials, and are not covered by this warranty. Operation or maintenance of the product other than as specified in SIMCO's service manuals, and any unauthorized modifications (even if intended to correct a problem) void all warranties. SIMCO's sole duty hereunder is to repair, correct, or at SIMCO's option, replace defective products or parts during the contract warranty period.

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## Introduction

The AN-2 and AN-6 Ionizing Air Nozzles provide rapid neutralization of a static charge by mixing positive and negative charged ions with the flow of compressed air or nitrogen.

The AN-2 is a point-of-use ionizer designed to attach to the end of a compressed air or nitrogen line with the nozzle pointing at the place where static neutralization needs to occur. The AN-6 is an in-line ionizer designed to install near, but not at, the end of a compressed air line. This allows the ionized air to be directed into areas where space limitations do not allow the use of a conventional nozzle.

Both the AN-2 and the AN-6 have been designed for use with the SIMCO AirFlow Controller (AFC), and feature a removable nose-cone that protects two replaceable, tungsten electrodes and covers the optional PGF-8 filter accessory.

The PGF8, disposable 2.2 micron filter, has over 50 cm<sup>2</sup> of effective filtration area, which allows the AN-2 or the AN-6 to be used in class 100 or above clean room applications. Depending on the Air Nozzle's usage and the quality of air type, the filter generally lasts about three months.

SIMCO recommends testing all ionizing equipment every three months for ion balance with a Charge Plate Monitor (Richmond Model EA-3).

**CAUTION! DO NOT** use the AN-2 or AN-6 with any power supply other than an AFC-2 power supply. Damage to the air nozzle will result and all warranties will be voided.

## Specifications

Inlet Pressure:	10 to 100 PSI
Voltage:	4 KV to 10 KV
Standard Cable Length:	6'
Electrodes:	Tungsten
Filter:	.2 micron hollow fiber cellulose
Nozzle Material:	PVDF
Nozzle Size:	3.4" x 1.0" (86 x 25 mm)
Inlet:	W' NPT
Outlet:	AN-2: 5/32 diameter with relief holes to meet OSHA requirements AN-6: 1/4" NPT (male)

## Safety

The maximum current available at the electrodes is 10 microamps. This current level is many times below the industry accepted "safe" level of 10 milliamps. A person touching an electrode experiences a slight shock, but it is very small. CAUTION! The AFC must be properly grounded to ensure safe and reliable operation. Turn the AFC off before removing the nozzle nose cone to service emitters and/or filter.

## Customer Service

Should a SIMCO product require service or if you have any questions regarding its usage, contact our Customer Service Department between the hours of 8:00 a.m. and 6:00 p.m. Eastern Standard Time, Monday through Friday at (800) 538-0750.

Contact SIMCO Customer Service to receive a Return Authorization (RA) number before returning any SIMCO product for repair, credit, or exchange.

## Filter Installation (optional)

The PGF8, a .2 micron filter accessory, fastens directly to the AN-2 and AN-6 inside the removable nose-cone. If performing a pre-clean room treatment of the equipment and to ensure minimum air line contamination, SIMCO recommends the filter be installed inside the clean room prior to using the nozzle.

1. Turn the AFC off (if connected to nozzle).
2. Remove the nose cone from the Air Nozzle by holding the nozzle body and rotating the cone counterclockwise.
3. Remove the PGF8 from its sealed bag. Do not touch the epoxied end of the filter as contamination may occur.
4. Carefully insert the epoxied end of the filter into the nozzle body and turn slightly counterclockwise until the threads line up or click. This helps to avoid cross-threading the filter.
5. Hand-tighten the filter clockwise until firmly seated against the nozzle body. Be careful when tightening the filter as the electrodes are extremely sharp, and susceptible to damage.
6. Fasten the nose-cone onto the nozzle body and tighten securely by rotating the cone clockwise.

## Connecting the Air Nozzle

The AirFlow Controller (AFC-2) powers either the AN-2 or AN-6 Ionizing Air Nozzle. Figure 1 shows the electrical and mechanical connections.

1. Turn the power to the AFC off prior to any servicing or cleaning.
2. Inspect the electrodes for excessive wear or particle accumulation and that they are finely seated.
3. Clean the electrodes every three months using a soft, sort-hair brush and denatured alcohol.
4. Replace, the PGF8, .2 micron filter, about every three months, depending on the frequency of usage and the environment.
5. Replace the electrodes approximately once every two years, depending on the frequency of usage. Should any damage to the AN-2 or AN-6 occur, immediately discontinue use and return the defective unit to SIMCO for repair or replacement. Refer to the Customer Service section at the beginning of this manual.

## Electrode Replacement

1. Turn the power to the AFC off.
2. Remove the nose-cone from the Air Nozzle by holding the body with the nose-cone pointing toward you and rotating the cone counterclockwise.
3. Pull each electrode straight out from its base using a pair of small needle-nose pliers. Do not squeeze the electrode too hard with the pliers as splintering may occur.
4. Hold the new electrode at its base using a pair of small needle-nose pliers and carefully insert the blunt end into one of the spring socket bases.
5. Carefully hold the electrode at its milled area near the point and push the electrode down into the base until finely seated.
6. Repeat steps 4 and 5 for the other electrode.
7. If the spring socket bases are damaged or loose inside the Air Nozzle base, discontinue use and return the unit to SIMCO for repair or replacement. Refer to the Customer Service section at the beginning of this manual.

## Calibration

The ion balance and pulse rate settings on the AirFlow controller power supply are factory set before shipment and should be adequate for most applications. Before making any adjustments, make sure the electrodes of the AN-2 or AN-6 in use are clean and that the filter is new.

SIMCO recommend verifying calibration (ion balance) for all ionizers every three months. Check the ion balance with a Charge Plate Monitor (Richmond EA-3).

Using the EA-3 Charge Plate Monitor

1. Refer to the EA-3 Manual for test setup and additional instructions.
2. Turn the EA-3 power switch on and select the decay mode.
3. Select the 1KV range and the Peak Voltage mode.
4. Turn the AFC power switch on and adjust the positive and negative voltage controls fully clockwise for maximum output voltage.
5. Adjust the AFC pulse rate control for a very rapid pulse rate. The red and green LEDs appear to flicker rather than to flash. If the LEDs on the AirFlow Controller remain lit or off, the pulse rate control has been turned too far and must be adjusted back from either the extreme clockwise or counterclockwise setting.
6. Hold the end of the AN-2 or AN-6 six inches away from the Charge Plate and open the air supply actuator valve to blow ionized air across it.
7. Observe the Plate Voltage meter on the EA-3. The display shows the ion balance (or imbalance) in volts. The ideal ion balance is zero volts.
8. If the Plate Voltage meter reads more positive than negative, adjust the Positive voltage control on the AFC counterclockwise to decrease the positive voltage. Conversely, if the meter reads more negative than positive, adjust the Negative Voltage control to decrease the negative voltage. Do not adjust either voltage control too low as this affects the decay rate or neutralization times.

## Cleaning and Maintenance

The electrodes are made of pure tungsten. The life of the electrodes varies depending on the applied voltage, humidity and polarity.

The positive electrodes wear faster than the negative due to the inward current flow. The shape of the electrode allows it to wear evenly without diminishing the ion generation. Replace the electrode once the point reaches a length of 1/16" (16 mm) from the spring socket base and always replace both electrodes at the same time.

## CAUTION:

*Turn the power to the power supply off before connecting or disconnecting an air nozzle or replacing its filter.*

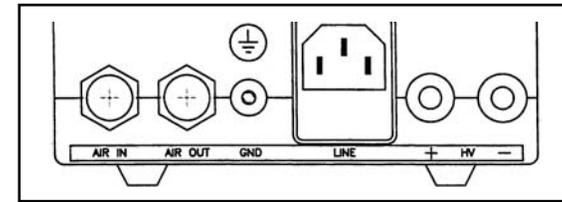


Figure 1

## AN-2

The AN-2 Air Nozzle connects directly to the end of an air line. The threads are W' female NPT, however a 1/8" female NPT is available by special request. The air line can be bent to direct the ionized air to the area where it is needed. The AN-2 Air Nozzle operates in many different applications and collects to any air or nitrogen source to provide an ionized air stream. When very clean air is required, use the AN-2 with a PGF8 disposable .2 micron filter.

## AN-6

The AN-6 in-line ionizing cartridge attaches at the end or in the middle of an air line. The threads are 1/4" female NPT, however, a 1/8" female NPT x 1/8" male NPT is available from SIMCO. If installing the AN-6 in the middle of an air line, do not use metal tubing downstream of the AN-6 as this eliminates the static neutralizing ions.

A maximum of four feet of tube either teflon or PVC, should be used downstream of the AN -6. If rubber tubing is required downstream, the AN-6 must be used with an air-switch activated power supply such as an AirFlow Controller. This allows ionization to occur only when air or nitrogen is flowing through the AN-6.

## Electrical Connections for an AN-2 or AN-6

1. Insert one of the HV plugs from an AN-2 or AN-6 into the lower output connector located on the rear panel of the power supply.
2. Insert the other HV plug into the upper output connector.
3. Refer to the Power Supply Grounding Instructions.

## Power Supply Grounding

When using the AN-2 or AN-6 with a metal, hand-held device such as an air gun, fasten an electrical grounding wire from the device to the chassis of the power supply to prevent possible electric shock.

1. Turn the power to the power supply off, or unplug the unit.
2. Remove the knurled thumb-nut from the ground post located on the rear panel of the power supply chassis. Do not remove the starlock washer.
3. If using insulated wire, strip and remove at least .5" (13mm) of insulation or strip .125" (3.1mm) and terminate with a ring-lug. Repeat when grounding a second device.
4. Place the ring-lug or wrap the ground wire from the device(s) onto the ground post and thread the knurled thumb-nut securely.
5. Hand-tighten the knurled thumb-nut securely.

## Tubing & Fittings

The AN-2 and AN-6 attach to a number of air lines that have a 1/4" NPT fitting. If using SIMCO air tubing, the following instructions describe how to shorten the tubing, attach the push-in fitting and how to remove the push-in fitting.

To shorten the length of air supply tubing:

1. Measure the flexible tubing to the desired length, add .001" (17.8 mm) from the measurement and mark. The added length fits inside the fitting.
2. Cut the tubing straight across the mark (90 degrees) using a single-edge razor blade. Do not use cutters as they tend to pinch the tubing.
3. Discard the excess tubing.

### To attach the push-in fitting to the tubing:

1. Carefully insert the tubing into the lock-ring in the small end of the fitting approximately .400" (7.6 mm)
2. Apply a little pressure to insert the tubing completely into the fitting another .300" (7.6 mm). The lock-ring should firmly grip the tubing and not allow the tubing to pull out.

### To remove the push-in fitting from the tubing:

1. Compress the lock-ring against the main body of the fitting using your thumb and index finger and, simultaneously, pull the tubing straight out from the fitting.

## Air Hose Connections for One Air Nozzle

To connect a single AN-2 or AN-6 to a single power supply such as the AirFlow Controller, see Figure 2 and proceed as follows:

1. Tightly wrap approximately 2.0" (3.1 em) of teflon tape around the threads of both air hose fittings on the power supply.
2. Connect the air hose from the compressor to the fitting labeled Air Intake on the rear panel of the power supply. A clockwise rotation tightens the air hose collar. **Do not** over-tighten.
3. Connect the AN-2 or the AN-6 air hose to the fitting on the right side of the power supply. A clockwise rotation tightens the air hose collar. **Do not** over-tighten.

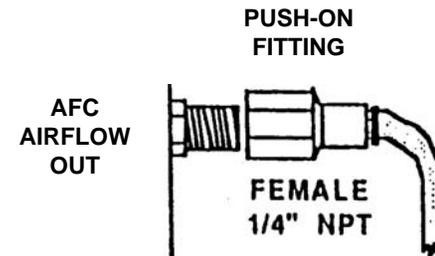


Figure 2

## Operating Instructions

The AN-2 and AN-6 connect to an air or nitrogen line to provide an ionized air source for use in many different applications. By using an AN-2 or AN-6 with a power supply with an internal airflow switch, such as the AirFlow Controller, static neutralizing ions emit only when air or nitrogen flows through the air Nozzle. The power supply controls the pulse frequency and output voltages.

Connect the AN-2 or AN-6 to a compressed air line with a sufficient air pressure for the intended application. To ensure optimum static neutralization, an air pressure as low as 10 PSI provides enough flow to completely neutralize static charges. Important! For most applications, SIMCO recommends an air pressure between 15 and 50 PSI. However, should an application require a greater air pressure, do not exceed 100 PSI.

1. Turn the power to the AFC on.
2. Position the output end of the Air Nozzle at least 6 inches away from the surface to be neutralized.
3. Open the air supply actuator valve to blow ionized air.
4. Keep the AN-2 or AN-6 in a secure place when not in use to prevent accidental damage.