You've come to expect the best in static control from SIMCO, the world's largest manufacturer of static control products.

With 65 years of leadership in the business, we understand the static control solutions you need to keep ESD and particle contamination levels under control. SIMCO's superior products incorporate years of engineering and field experience, providing money-saving integrated solutions for cleanroom, tool, or electronics manufacturing environments. You can be sure of maximum performance and reliability at reasonable cost.

See how the quality of SIMCO products enhances the quality and yield of your cleanroom operations. Call SIMCO today at 800-538-0750 for more information.

SIMCO®
2257 North Penn Road
Hatfield PA, 19440
email - info@esimco.com
www.simcolON.biz
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We have been providing static control solutions for 65 years, and are the only multinational manufacturer of ionization equipment. Only SIMCO provides manufacturing, technical support, and product development capability from locations in the United States, the Netherlands, and Japan.

worldwide leaders in ionization for electronics manufacture

United States
Japan
Holland

To find the most appropriate ionization products for your application, use this Selector Chart. Select your Cleanroom Class or Environment, then type of Ionization product required.

For more information, call SIMCO Customer Service at 800-538-0750 (in USA) or 1-215-997-0590.
**Terms and Warranty**

Although every attempt is made to ensure that the information contained in this catalog is accurate and up-to-date, please check with your SIMCO representative or SIMCO Customer Service before specifying or purchasing this equipment to confirm availability, exact specifications, and suitability for your applications. Specifications are subject to change without notice.

**Terms and Conditions of Sale**

**Freight Policy**
- UPS Prepay and Add
- FOB-Shipping point
- Other modes freight: COLLECT

**NET**
- Cash in Advance
- Major Credit Card
- Letter of Credit
- Sight Draft
- Cash in Advance
- Other modes freight: COLLECT
- FOB-Shipping point
- Major Credit Card

**Outside USA**
- Net 30
- Cash in Advance
- Other modes freight: COLLECT
- FOB-Shipping point
- Major Credit Card

**OBSCURED PRODUCTS**

If you are looking for information on a previously purchased SIMCO/Richmond product and do not find it in this catalog, contact SIMCO Customer Service directly at 215-997-0590. Replacement parts and service of obsolete SIMCO/Richmond products may still be available. Some products may no longer be offered because they have been replaced by new, enhanced product offerings. Please call for more information about products that do not appear in this catalog.

**Warranty**

SIMCO equipment has been carefully tested and inspected at the factory and is warranted to be free of defects in components, workmanship, and materials for a period of one year from the date of purchase.

SIMCO will, under this warranty, repair or replace any equipment which proves, upon our examination, to have become defective within the Warranty period from the date of purchase. Equipment is to be returned by the purchaser to SIMCO, 2257 North Penn Road, Hatfield, PA, 19440, with transportation prepaid and insured for its full purchase price. Prior to returning goods for any reason, contact SIMCO for a Return Authorization Number, which must accompany all returns.

The Warranty does not apply when the equipment has been tampered with, misused, improperly installed, altered, has received damage through abuse, carelessness, negligence, accident, connected to improper line voltage, or has been serviced or modified by anyone other than a SIMCO authorized technician. Any unit that has had its serial number altered or removed will be ineligible for Warranty.

SIMCO 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 SIMCO be liable for incidental or consequential damages except where state 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.

SIMCO makes no Warranty, expressed or implied, nor accepts any obligation, liabilites or responsibility in connection with the use of this product other than the repair or replacement of parts as stated herein.

**Obsoleted Products**

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**Product Testing**

At SIMCO, we are constantly subjecting our products to safety and technical compliance examination by nationally recognized testing laboratories (NRTL). Some of the applicable file numbers for approved products are listed below as well as brief explanations of the listing types. If the approval you require does not appear, consult SIMCO with your needs.

**UL Underwriters Laboratories, Inc.**

Product Listed: Listing and Follow-up Service for U.S. and Canada. File E1145: Listed - Static Neutralizing Equipment

Products in this file listing include many of the neutralizers with integrated power supplies such as the Aerostat ionizers and the Top Gun ionizing blowoff gun and power supply units.

Listing and Follow-up Service applies to products which have been evaluated with respect to reasonably foreseeable hazards to life and property, and in which the risk of such hazards have been reduced to an acceptable degree. UL is a registered trademark of Underwriters Laboratories, Inc.

**CE**

CE products are determined compliant with applicable directives for Europe, through self-declaration or nationally recognized testing laboratories (NRTL).

SIMCO products examined under the CB Scheme established by the International Electrical Committee for Testing to Standards for Electrical Equipment (IECEE). The scheme is based on the principle of mutual recognition of testing results by participating National Certification Bodies (NCBs) to facilitate the international trade of products.

SIMCO products contained in this catalog are covered by one or more U.S. patents and corresponding foreign patents or U.S. and foreign patents pending. Detailed foreign patent information is available upon request.

SIMCO, Aerostat, AirRing, PulseFlow, PulseBar, CleanTrac, and AirFlow are registered trademarks of SIMCO. Top Gun, PC, Guardian, Centurion, onION, miniION, scorpion, fusion, Gemini, SnapTrac, CleanTrac, AirSmoke, and PulseGun are trademarks of SIMCO.

**SIMCO® products**

SIMCO® products incorporate years of research, engineering, and field experience that add up to effective, integrated solutions in the most demanding environments. SIMCO is your single-source supplier for a complete line of ionizing equipment.

Headquartered in Hatfield, PA, USA, SIMCO specializes in controlling electrostatic discharge (ESD) events, electrostatic attraction (ESA contamination), and electromagnetic interference (EMI) resulting from ESD events. Our comprehensive line of equipment is designed for use in the semiconductor, data storage, display, medical device, and electronics assembly industries. SIMCO capabilities are unique in the world. Our multi-national experience, expertise and capability allow us to offer either AC or DC coronal technology, and the ability to recommend the product technology best suited to each application. SIMCO holds more patents than any other ion equipment manufacturer-more than twice the number of patents held by our nearest competitor.
SIMCO takes a customized and comprehensive approach to total cleanroom ionization. Proper grounding procedures can efficiently neutralize charges on conductors, but only ionization can eliminate harmful charges on isolated conductors and insulative materials such as plastics. SIMCO's patented Gemini Room Ionization Systems deliver next generation performance with unprecedented system control. Gemini System features include patented Germanium emitters for use in ultra-clean environments.

Static charges are found in many phases of semiconductor manufacturing—wafer production, fabrication, packaging, and testing. Controlling static charges is vital because ESD has a significant impact on device yields. Defects caused by electrostatically-attracted foreign matter and ESD events can contribute to manufacturing yield losses.

Stringent contamination control standards for flat panel display manufacturing often require the use of mini-environments or complete room ionization systems to isolate sensitive products from ambient particle contamination during fabrication.

Sensitive MR heads are easily damaged or destroyed by ESD events. SIMCO's overhead and benchtop ionizers quickly neutralize harmful electrostatic charges with stable balance performance and protect critical drive assembly and production processes.

ESD can seriously damage sensitive electronic components and assemblies. SIMCO's extensive line of Aerostat ionizers protect production processes such as PCB manufacturing and assembly, surface mount technology, device programming, medical device manufacturing, and testing.

IN A PUBLISHED STUDY
Germanium was found to shed less particulates, under high voltage stress than silicon

SIMCO's patented (US Patent No. 6,215,248 B1) non-metallic Germanium emitters certified 99.999% pure are the new standard in ionization designed for ultra-clean environments.

Static eliminators use the principle of electric corona to ionize air. In electric corona, high voltage at low current is concentrated on emitter points. High voltage on the tip of the emitter can result in the generation of particulates. In environments that must be free from particles and impurities, this can cause yield and process problems.

Since impurities cause damage in advanced technologies, contaminant must be suppressed to the lowest possible level. Simco recommends non-metallic Germanium emitter points for these applications. In a study published in the Journal of Electrostatics (Noll, C.G. and P.A. Lawless, Comparison of Germanium and silicon needles as emitter electrodes for air ionizers 1 44 (1998) 221-238), Germanium was found to shed less particulates, under high voltage stress than silicon. The use of 99.999% pure, Type N, non-metallic Germanium doped with antimony for ionizing emitter points patented by SIMCO, minimizes particulates.

Ultra-clean environments are required in many production processes including:
• Semiconductor Manufacturing
• Flat Panel Display Manufacturing
• Medical and Electronic Device Assembly

SIMCO's Ionization Systems provide the solution for production processes in ultra-clean environments that require static control.

• Made of Germanium certified 99.999% pure, N-Type polycrystalline doped with antimony for conductivity
• Precision ground with an extra fine finish
• Certification of compliance maintained for traceability
**Simco's Experience and Comprehensive Approach Ensure Engineered Solutions and Answers**

Simco experts offer a complete evaluation of your control level needs based on your product, process, and technology. Their expertise and comprehensive approach ensure that they provide you with the best possible solution.

**ANSI/ESD S20.20 Compliance**

Simco's experience in the semiconductor and related clean-manufacturing industries allows them to guide device and equipment manufacturers in determining acceptable electrostatic discharge control levels based on manufacturing process and technology considerations. Their approach ensures that your facilities comply with the latest standards and regulations, maximizing overall equipment efficiency and output.

**Equipment Maintenance & Calibration**

Simco's capability in the design, development, and manufacture of electrostatic charge control equipment is second to none. They ensure that your equipment is properly maintained and calibrated to maintain optimal performance and reliability.

**ANSI/ESD S20.20 Program Assessment**

All corona ionization systems cause deposits to form on the emitter tips over time. Periodic cleaning of emitters makes a valuable contribution to optimum system performance and life. Service frequency depends on several factors including the cleanliness and relative humidity of the operating environment. Process and system performance demands are considered when Simco makes recommendations for your maintenance and calibration intervals.

**Process**

- Simco experts assess compliance with plan elements.
- Steps in the compliance assessment process require development of an ESD control plan based on S20.20 and are tied into your facility quality control program, such as ISO 9000.
- Implementation of the Plan may then take place with training and installation of ESD controls.
- In the final step, the team develops and begins Plan inspections and audits. These steps prepare you to pursue facility accreditation.

**Specifications**

- **Size:** 17.5" x 1.5" x 1.25" (L x W x D) (44.9 x 3.8 x 3.2 cm) without emitters.
- **Weight:** 20 oz. (544 g)
- **Input:** <28 VDC, 2.0 watts nominal
- **Operating Mode:** Pulse
- **Control Signal:** RJ-45 telephone type modular jack at each end of the emitter module.
- **Emitter Points:** Two bi-color LEDs located near each emitter. Green indicates the polarity and duration of the ion emission. Flashing LEDs confirm communications with the remote transmitter. Red LEDs indicate a Fault condition.
- **Status Software- Included:** Requires Windows® based PC with RS-232 comm port.
- **Emitter Points:** Germanium for ultra-clean emitters and indicators project below the ceiling.
- **Mounting:** Mounts 20 oz. (544 g)

**System Functions**

- **Self-monitoring for assures controlled, consistent ion output**
- Easy mounting on flush or T-grid ceiling systems
- Adjusted individually using a handheld remote control transmitter
- System flexibility allows ideal positioning of modules where most needed
- Designed to minimize unidirectional airflow turbulence

**Gemini EP**

**DESCRIPTION**

The Gemini EP has been designed to provide essential performance in the control of electrostatic charges in semiconductor manufacturing facilities and in cleanroom environments such as display and medical device manufacturing. An array of ion emitter modules are attached to the cleanroom ceiling grid and connected to a controller in a daisy-chain manner using modular telephone type wire and connectors. The system’s flexibility allows for ease of installation and blanket area protection.

**SIMCO’s patented Gemini EP features superior flexibility that allows easy positioning of emitter modules around ceiling.** The Gemini EP emitter modules can be adjusted individually using a handheld remote control transmitter or all the emitter modules can be adjusted together using the system controller.

- Each emitter module contains emitter points, switching power supplies and Microcontroller Intelligence, designed to maintain critical ion output and balance. Each module produces both positive and negative ions, which neutralize electrostatic charges in the work area. The cleanroom’s unidirectional airflow sends the ions downward through the room providing blanket protection, helping to keep all surfaces and products free of static charge.
- Each emitter module stores a balance reference value and an ion output current reference value, a patented feature of the Gemini Systems. Values are used by automatic balance control and automatic ion output current control circuitry to ensure stable operation and consistent performance.
- Profile emitter modules send fault condition information to the system controller, and from the controller to the PC monitoring software provided with the system.

**Gemini EP system functions are maintained by a micro-controller-based communication network.** The System Controller maintains contact with every Emitter Module to verify conditions. The cleanroom’s unidirectional airflow sends the ions downward through the room providing blanket protection, helping to keep all surfaces and products free of static charge.

**Features**

- Self-monitoring for assures controlled, consistent ion output
- Easy mounting on flush or T-grid ceiling systems
- Individually adjustable with remote transmitter
- System flexibility allows ideal positioning of modules where most needed
- Designed to minimize unidirectional airflow turbulence

**ANSI/ESD S20.20 program assessment**

The standard was developed by the ESD Association for industry and the military, in support of an expressed need for a comprehensive electrostatic discharge (ESD) program design. The standard provides manufacturers and electronics users with an effective ESD control program framework that defines minimum requirements for enhancing product reliability and productivity.

**PROCESS**

- SIMCO experts assess compliance with plan elements.
- Steps in the compliance assessment process require development of an ESD control plan based on S20.20 and are tied into your facility quality control program, such as ISO 9000.
- Implementation of the Plan may then take place with training and installation of ESD controls.
- In the final step, we develop and begin Plan inspections and audits. These steps prepare you to pursue facility certification.

**SIMCO’s capability in the design, development, and manufacture of electrostatic charge control equipment is second to none.** All corona ionization systems cause deposits to form on the emitter tips over time. Periodic cleaning of emitters makes a valuable contribution to optimum system performance and life. Service frequency depends on several factors including the cleanliness and relative humidity of the operating environment. Process and system performance demands are considered when SIMCO makes recommendations for your maintenance and calibration intervals.

**In most environments cleaning should be scheduled on a quarterly basis. SIMCO recommends initial cleaning and evaluation after 90 days. Emitter cleaning frequency is determined through observation. Cleaning does not harm the emitters. Regular cleaning of emitters removes deposits that can reduce emitter life and effect system performance.**

**CALIBRATION**

System calibration requires analysis of the operating parameters of the ionizer, its operating environment and includes any adjustments that may be necessary to correct operation. This service is performed after maintenance and cleaning of the emitters has been completed.

**Standard performance tests include discharge time and offset voltage. Evaluations of the system are made in accordance with ESD Association Standard Test Method ESD STM3.1-2000 Ionization.**

**ANSI/ESD S20.20 Compliance Evaluation**

In response to the semiconductor industries continuing focus to improving overall equipment efficiency (OEE) and insure consistent yield performance the SEMI organization developed the E78 Electrostatic Compatibility-Guide to Assess and Control Electrostatic Discharge (ESD) and Electrostatic Attraction (ESA) for Equipment. E78 defines specific levels and test methods used to measure charge and electrostatic fields on wafers and handlers.

This SEMI document describes leading problems caused by uncontrolled electrostatic charge as they affect tool operation and performance in the semiconductor and related clean-manufacturing industries. The E78 document is designed to guide device and equipment manufacturers in determining acceptable electrostatic discharge control levels based on manufacturing process and technology considerations.

**PROCESS**

- SIMCO experts offer a complete evaluation of your control level need based on your product, process, and technology.
- Simco’s experience and comprehensive approach ensure engineered solutions and answers.
Control of electrostatic discharge in cleanroom manufacturing processes is critical because it can have a significant impact on productivity and device yields. Serious problems often result from:

- Damage to product, components, or process tools resulting from a direct electrostatic discharge (ESD) event
- Contamination on surfaces due to electrostatic attraction (ESA) of particles
- Process equipment latch-up caused by electrostatic discharge and resulting electromagnetic interference (EMI)

Many of the processes used to manufacture products in the semiconductor, flat panel display, disk drive and medical device manufacturing industries require use of non-conductive materials and isolated conductors. These materials generate and retain large charge potentials. In addition, process equipment and materials facilitate charge introduction on the wafers, glass substrates, magnetic media, and magnetic heads produced by these industries.

Wafers and FPDs which become charged through handling and transporting act as a magnet for airborne contaminants, which can significantly affect yields in critical processes such as photolithography, coating, and etching. A dependable ionization system is needed to keep static charges at a low level so contaminants are not attracted to sensitive surfaces during these critical assembly and manufacturing processes.

Grounding, using items such as wrist straps and conductive footwear, is the first line of defense in controlling static charge and will dissipate static very rapidly. But in many cases grounding is impractical or impossible. Ionized air can bridge the gap between charged objects and ground potential. "Conductive air" allows electron flow to or from any charged object, satisfying any charge imbalance. A charged insulator can remain charged for many hours. Opposite polarity charges can attract each other, repel like polarity ions until charges are neutralized.

Ionizers give molecules in the air the ability to carry charge. These charged air molecules are able to neutralize electrostatic charge on both insulators and conductors. An ion air ionizer is capable of neutralizing charge because it produces mobile positive and negative charge carriers. Two mechanisms allow these ions to neutralize charge; conduction and exchange. Neutralization of charge by ion air is dependent on a number of complex interactions. Ions move by electrostatic force and are often assisted by airflow to the target object or surface.

Air ionizers are capable of delivering many benefits including: control of particle contamination, protection of electrostatic discharge sensitive devices, and reduction of process equipment lock-up. The requirements for ionizer discharge time and ion balance performance should be determined as a consideration of your process or product.

### Corona Ionization

- **Negative power supply and emitter**: + + + +
- **Positive power supply and emitter**: + + + +

Charged air molecules cover and surround a surface within range of the ion emitter system. Charge on the surface will attract ions of the opposite polarity and repel like polarity ions until charges are neutral.

### Air Ionization

Air ionization complements and completes any program that intends to eliminate all electrostatic charge sources. In many areas, such as cleanrooms and mini-environments, air ionization is the only practical method of static control. A typical ionization system can remove 1,000 volts in less than 1 minute. Research has shown that room ionization typically reduces particle counts by 50% to 90%. Room ionization can increase equipment uptime and decrease tool repair costs up to 50%.

### Specifications

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Negative Power</strong></td>
<td>9 VDC Alkaline Battery</td>
</tr>
<tr>
<td><strong>Positive Power</strong></td>
<td>9 VDC Alkaline Battery</td>
</tr>
<tr>
<td><strong>Power Consumption</strong></td>
<td>0.5 to 12-second timing</td>
</tr>
<tr>
<td><strong>Operating Mode</strong></td>
<td>16.25” x 8.75” x 4.5” (W x L x D)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>10 each, 8-pin</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>(41.7 x 22.4 x 11.5 cm)</td>
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<tr>
<td><strong>Material</strong></td>
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<td><strong>Shipping Weight</strong></td>
<td>(11.3 kg)</td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td>(7 x 11.7 x 2.9 cm)</td>
</tr>
<tr>
<td><strong>Output Connector</strong></td>
<td>8-pin RJ-45 telephone-type modular jacks</td>
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<tr>
<td><strong>Size</strong></td>
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<td><strong>Control Transmitter</strong></td>
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<td><strong>Power Source</strong></td>
<td>Remote - Infrared Signal</td>
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<tr>
<td><strong>Controlling</strong></td>
<td>Controls - Address one individual emitter</td>
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<tr>
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Controlling static charges in manufacturing processes is critical because it can have a significant impact on productivity and device yields. Serious problems often result from:

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Many of the processes used to manufacture products in the semiconductor, flat panel display, disk drive and medical device manufacturing industries require use of non-conductive materials and isolated conductors. These materials generate and retain large charge potentials. In addition, process equipment and materials facilitate charge introduction on the wafers, glass substrates, magnetic media, and magnetic heads produced by these industries.

Wafers and FPDs which become charged through handling and transporting act as a magnet for airborne contaminants, which can significantly affect yields in critical processes such as photolithography, coating, and etching. A dependable ionization system is needed to keep static charges at a low level so contaminants are not attracted to sensitive surfaces during these critical assembly and manufacturing processes.

Grounding, using items such as wrist straps and conductive footwear, is the first line of defense in controlling static charge and will dissipate static very rapidly. But in many cases grounding is impractical or impossible. Ionized air can bridge the gap between charged objects and ground potential. "Conductive air" allows electron flow to or from any charged object, satisfying any charge imbalance. A charged insulator can remain charged for many hours. Opposite polarity charges can attract each other, repel like polarity ions until charges are neutralized.

Ionizers give molecules in the air the ability to carry charge. These charged air molecules are able to neutralize electrostatic charge on both insulators and conductors. An ion air ionizer is capable of neutralizing charge because it produces mobile positive and negative charge carriers. Two mechanisms allow these ions to neutralize charge; conduction and exchange. Neutralization of charge by ion air is dependent on a number of complex interactions. Ions move by electrostatic force and are often assisted by airflow to the target object or surface.

Air ionizers are capable of delivering many benefits including: control of particle contamination, protection of electrostatic discharge sensitive devices, and reduction of process equipment lock-up. The requirements for ionizer discharge time and ion balance performance should be determined as a consideration of your process or product.

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**AC or DC**

Electrically-based corona technology is most widely used ion generation method for static charge control. In this method, electrical ionizers generate ions by concentrating an electric field onto an emitter point. SIMCO designs and manufactures all three types of corona ionizers.

**Steady State DC** ionizers generate bipolar ions using independent positive and negative power supplies connected to dedicated emitters. SSDC systems require a minimum of two emitters to generate bipolar ions. Both positive and negative power supplies operate continuously, creating ions at each emitter. SSDC ionization creates a very high ion current, since it produces ions of both polarities with no off-time cycle. Properly designed systems and emitter spacing will result in a maximum of space charging and low offset voltage. Recombination of the bipolar ion can be reduced by controlling the distance between the positive and negative emitters. ON/OFF switching of DC power supplies can occasionally result in “noise” (RFI and EMI) that can affect electronic circuits and cause equipment malfunction. Steady State DC avoids this consequence. SSDC systems are the preferred alternative in room systems applications that require low offset voltage.

**Pulse DC** is the newest development in corona ionization operating modes. It is more complex and more demanding in its operating requirements and setup. As in Steady State DC, in-dependent positive and negative power supplies are connected to dedicated emitters to generate bipolar ions. In this case a square wave oscillation of the independent power supplies is used. The pulse rate is slower than AC and performance becomes similar to SSDC when the frequency approaches 10 Hz.

Pulse frequency impacts balance and total ion output. Longer pulse times are used as the distance from the emitter to the target object increases. Longer pulse duration is also useful as air velocity in the environment decreases. The major advantage realized by pulsing positive and negative ions is optimizing the number of ions available to eliminate electrostatic charge. The technology allows bipolar ion separation in time. Separation reduces the chance positive and negative ions will recombine before they reach the intended target. Pulse DC makes it possible to effectively ionize the air in rooms.

**Features**
- Easy mounting in all leading designs of flush, or on T-grid ceiling systems
- Drop link communications
- Active closed-loop feedback system
- Individually adjustable via system controller or remote transmitter
- Steady State and Pulse modes can be universal or mixed
- Addressable emitter modules
- Choice of Germanium or tungsten emitters
- Individually adjustable via system controller or a hand-held remote transmitter. Operating reference values are stored in a software adjustable memory. The “smart” Gemini controller polls each emitter module to verify system operation, providing assurance the system is operating as you have specified.

SIMCO’s Gemini™ Room Ionization System features individually addressable Profile emitter modules. Each module has an individual identification that allows the system controller or the remote control transmitter to address and control each emitter. The Gemini System’s flexibility allows easy positioning of emitter modules in the ceiling or where they are most needed in the cleanroom. The System is designed to minimize unidirectional airflow turbulence. It is available with SIMCO’s patented Gemini Room Ionization System feature and system modules. Each module contains emitter points, switching power supplies, and Microcontroller Intelligence, designed to maintain critical ion output and balance. Each module produces both positive and negative ions, which neutralize electrostatic charges in the work area. The cleanroom’s unidirectional airflow sends the ions downward through the room. In this way, the Gemini System modules provide blanket protection, helping to keep all surfaces and product free of static charge and particles.

**AC or DC**

**Application**
- AC
- Steady State DC
- Pulse DC

**Air Ionization Systems ...Typical Applications**
- Room Systems
- Mini Environment
- Compressed Gas
- Unidirectional Flow Bench
- Work Surface

**SIMCO’s Gemini™ Room Ionization System** can be custom installed either suspended or recessed in most cleanroom ceiling systems. Emitter modules are spaced around the room and connected to the controller(s) in a Daisy chain manner. The new Gemini Profile™ emitter module is designed to minimize turbulence in unidirectional airflow. Each emitter module contains separate positive and negative ion emitters with microprocessor control of output and balance. Modules are available with SIMCO’s patented Germanium emitters, the new standard in ionization designed for ultra-clean environments.

**Typical Applications**
- Semiconductor Manufacturing
- Display Manufacturing
- Storage Media
- Medical and Electronic Device Assembly

**SPECIFICATIONS**
- Size: 17.25 x 1.5 x 1.25" (W x L x D)
- Weight: 20 oz. (544 g)
- Operating Mode: Selectable Pulse or Steady State
- Status Software: Included; requires Windows® based PC with RS-232 comm port
- Address Control: Establish a unique address
- Indicators: Two bi-color LEDs, one located near each emitter. Green indicates the respective polarity and duration of ion emission. Flashing green LED confirms communication with the remote transmitter. Red LEDs indicate a Fault condition
- Emitter Points: Germanium for ultra-clean requirements; 100% tungsten for Class 1 compatible; easily replaceable.
**Description**

The Guardian provides fast static charge decay efficiency over an entire work surface area. Equipped with task lighting, it offers user-friendly operation while effectively protecting even the most sensitive components from ESD damage.

**Typical Applications**

- Electronics Assembly
- Semiconductor Test
- Medical Device Parts Assembly and Packaging

**Features**

- AC technology for stable performance
- Inherently balanced to 0 ±5 V
- Integrated heater and task lights
- Ionization indicator light
- Patented built-in emitter point cleaner

**Specifications**

- **Discharge Time** < 6 sec. at 18' Size: 42.75" x 4" x 6.75" [W x H x D]
  - Weight: 16 lbs. (7.3 kg)
- **Air Volume Output** - 150 CFM - 300 CFM (low to high)
  - Combined three-fan output
- **Effective Coverage** - 2 x 4 Area
- **Air Temperature (Heater On)**
  - Low: -25°F (14°C)
  - High: -11°F (6°C)

**Airflow Beneath Guardian CR2000**

- **Approximate 4" Cushion of Ionized Air Protection**

**Model Numbers**

- **Guardian CR2000**
  - Two Fan: 120 V, 60 Hz . . . . . 4008729
  - Three Fan: 230 V, 50 Hz . . . . . 4008730
- **Guardian CR2000**
  - Two Fan: 120 V, 60 Hz . . . . . 4008630
  - Three Fan: 230 V, 50 Hz . . . . . 4008705

**Specifications**

- **Emitter Type**
  - Germanium for ultra-low clearance

**Operation**

- Controlled airflow can improve performance of any ionizer. In applications that may benefit from improved performance, one fan assembly is simply clipped to the fusION housing and power to the fan is supplied through a built-in connection.

**Multiple units can be linked together from one 24V DC power source allowing 4 units to be daisy-chained.**

**Features**

- Easy to install and operate
- Compact design
- Auto Regulating - patented
- System Integration Compatible
- Optional fan
- Choice of Germanium or tungsten emitters

**Specifications**

- **System Performance**
  - Discharge Time: ±1,000 - ±100 V
  - <10 seconds at 6" (15.2cm)

**Operating Specifications**

- **Power Input** - 24VDC
  - Connectors: 4 x 4 modular; DC power IN
  - Operating Mode: steady-state DC

**FMX002**

- **Low Range** - ±1.5 kV
  - High Range: ±20.0 kV
  - Ion Balance Measurement (Charge Plate Installed)
  - Low Range: ±150 V
  - High Range: ±200 V
  - Power: 9.8 V

**Specifications**

- **Size** - 4.5" x 2.5" x 1" (L x W x H)
  - Weight: 12 oz.
- **Charge Plate**
  - Size: 2.0" x 2.0" x 2.0" (L x W x D)
  - Weight: 4.6 oz.

**Model Numbers**

- **FMX002**
  - Low Range: . . . . . . 4008744
  - High Range: . . . . . . 4008745
  - Charge Plate: . . . . . . 5051021
Specially selected components ensure cleanliness of the centurION’s output air to meet or exceed Class 10 particle limits. Its centurION’s final assembly, final test, and packaging take place in a Class 100 cleanroom to minimize risk of contamination.

**MinION™**

**DESCRIPTION**

The minION OH overhead ionizer has been designed to control electrostatic charges in assembly and electronics manufacturing applications requiring stable performance in an affordable package.

The minION OH incorporates Simco’s steady state DC corona ion technology and features active self-monitoring to assure the user of controlled, consistent ion output.

Performance is enhanced by use of Simco’s patented radial emitter design. The products design stability reduces maintenance frequency. A built in emitter cleaner reduces maintenance time in the minION OH. Our unique geometry and airflow control provide stable performance, meeting the demands of product assembly operations using electrostatic sensitive IC components.

**FEATURES**

- Static charge neutralization +/−3 V offset voltage (balance)
- Class 10 ionroom ISO-4 compatible
- Fan speed control
- Patented emitter design

**SPECIFICATIONS**

- Offset Voltage*: +−3 V from set point, set point adjustable to 0 V
- Balance - Adjustable to zero

**CENTURION™**

**DESCRIPTION**

The centurION ionizer is designed specifically for use in critical cleanroom applications. It offers superior balance performance with its patented emitter array design and high-gain dual feedback circuitry. Using steady state DC ion technology, the centurION eliminates charges cleanly, quickly and reliably in cleanroom workstation applications where electrostatic discharge (ESD) is a concern. It is designed for applications where even very low levels of static charge can damage sensitive components.

Specially selected components ensure cleanliness of the centurION’s output air to meet or exceed Class 10 particle limits. Its centurION’s final assembly, final test, and packaging take place in a Class 100 cleanroom to minimize risk of contamination.

**FEATURES**

- Static charge neutralization +/−3 V offset voltage (balance)
- Class 10 cleanroom ISO-4 compatible
- Fan speed control
- Patented emitter design

**SPECIFICATIONS**

- Offset Voltage*: +−3 V from set point, set point adjustable to 0 V
- Balance - Adjustable to zero

**CLEANTRAC®® AND MINION™ CONTROLLER AND FMX-002**

**DESCRIPTION**

The CleanTrac Ultra-Clean Ionization Bar incorporates a patented air flow technology which utilizes Clean Dry Air (CDA) to minimize buildup of contaminants on ionizers. It is specifically designed for use in Class 1 areas such as microenvironments and laminar flow benches where particle contamination and control of electrostatic charges are critical concerns.

CleanTrac’s patented air flow technology inhibits the formation of particles on emitter electrodes, dramatically reducing maintenance requirements. It is powered by the visION Controller.

The CleanTrac’s patented* Germanium emitters provide the most particle-free airflow available in the industry. The compact visION Controller delivers superior ionization balance and charge neutralization efficiency for critical ESD applications. It is designed to be used with an emitter system such as the C CleanTrac bar for control of electrostatic charges. Three user-switchable operating modes provide maximum flexibility for a variety of application sensitivities, while minimizing the need for maintenance routines common to competitive designs. This regulated steady state DC power supply incorporates feedback circuitry that enables the unit to maintain performance for extended periods. A user interface allows for remote system control and system monitoring.

**SPECIFICATIONS**

- Dimensions - 1”W x 1.85” H
- Weight - 3 oz. per ft. (85 grams per 30 cm)
- Input Voltage - ±7 V nominal
- Emitter Material - 100% Germanium
- Input Air Pressure - 15 PSI maximum (nominal operation < 5 PSI)
- Air Flow - 2 CFH per electrode nominal
- Input Air (< 500 ppm H2O) - Clean Dry Air (CDA)
- Air Flow Gauge - 2-20 CFH or 5-50 CFH depending on number of electrodes
- * U.S. Patent No. 6,215,248B1

**FMX-002 ELECTROSTATIC FIELDMETER**

**DESCRIPTION**

SIMCO’s Model FMX-002 Electrostatic Fieldmeter is a compact, portable survey instrument designed to be used with CleanDryAir (CDA) to measure electrostatic field strength in work areas:

- Electrostatic balance and charge neutrality
- Streamline ionization balance performance by attaching a charge plate. The handy, compact design of this unit allows electrostatic survey measurements in work areas:
- Determining static charge levels
- Deciding the placement of ionizers
- Periodic verification readings

**FEATURES**

- Accurately locating and treating static-related problems at the source
- Can significantly increase product quality, output, and yields

**SPECIFICATIONS**

- Input Air Pressure - ±7 kV nominal
- Input Voltage - ±7 kV nominal
- **U.S. Patent No. 6,215,248B1**

**CLEANTRAC®® AND MINION™ MODEL NUMBERS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lengths/Emitters</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT103</td>
<td>10’/4’</td>
<td>4006979</td>
</tr>
<tr>
<td>CT204</td>
<td>21’/6’</td>
<td>4006980</td>
</tr>
<tr>
<td>CT304</td>
<td>33’/8’</td>
<td>4006981</td>
</tr>
<tr>
<td>CT404</td>
<td>45’/12’</td>
<td>4006982</td>
</tr>
<tr>
<td>CT504</td>
<td>57’/14’</td>
<td>4006983</td>
</tr>
<tr>
<td>CT604</td>
<td>69’/18’</td>
<td>4006984</td>
</tr>
</tbody>
</table>

**FMX-002**

**DESCRIPTION**

SIMCO’s Model FMX-002 Electrostatic Fieldmeter is a compact, portable survey instrument for measuring electrostatic charge. The FMX-002 measures positive and negative polarity electrostatic charges to 20 kV (20,000 V) at a distance of one inch (25 mm). Two LED guide ring lights on the measuring side of the unit converge at the proper distance from a test object. The conductive case and ground lead facilitate reference grounding for accurate measurement.

**FEATURES**

- Portable air flow technology
- Available with Germanium emitters
- Aerodynamic “Leadbag” profile

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Lengths/Emitters</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>visION 100-120 V</td>
<td>4006832</td>
<td></td>
</tr>
<tr>
<td>visION 230 V</td>
<td>4008899</td>
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**CENTURION® COMPARISON CHART**

<table>
<thead>
<tr>
<th>Model</th>
<th>centurION Single Fan</th>
<th>centurION Two Fan</th>
<th>centurION Three Fan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Line Voltage</td>
<td>100-240Vac, 50/60Hz</td>
<td>100-240Vac, 50/60Hz</td>
<td>100-240Vac, 50/60Hz</td>
</tr>
<tr>
<td>Discharge Time*</td>
<td>at 12”</td>
<td>at 18”</td>
<td>at 18”</td>
</tr>
<tr>
<td>&lt;3 seconds</td>
<td>&lt;3 seconds</td>
<td>&lt;3 seconds</td>
<td></td>
</tr>
<tr>
<td>&lt;5 seconds</td>
<td>&lt;5 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fan Speed Low</td>
<td>50 CFM (23 l/s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fan Speed High</td>
<td>90 CFM (42 l/s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Coverage</td>
<td>1’ x 4’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>3.5 lbs. (1.61 kg.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size (Includes x W x D)</td>
<td>9.37” x 8” x 3.37”</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OVERHEAD IONIZERS ... CENTURION™ AND MINION™**

<table>
<thead>
<tr>
<th>Model</th>
<th>No. of Fans</th>
<th>Single</th>
<th>Two</th>
<th>Three</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.AW/Jap.</td>
<td>4009408 4009430 4009423</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cont. Euro.</td>
<td>4009409 4009431 4009424</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>4009410 4009432 4009425</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Tested in accordance with IEC-STM 3.1:2000 ionization level ** Emitters: 2 & 3 fan only. C: Cone fan
**DESCRIPTION**

Aerostat XC Extended Coverage Air Blower

**FEATURES**
- Rapid static discharge
- Balanced to 0±5 V
- Patented emitter point cleaner
- Three-speed fan
- Ionization status light
- Heater

**SPECIFICATIONS**

- Discharge Time*: <2 sec at 12"  
  Size - 15.37" x 4.5" x 8.12" (W x H x D)  
  (39 x 11 x 21 cm)  
  Weight - 17.5 lbs (7.9 kg)
- Air Volume Output:
  - 70 CFM (low fan speed)
  - 95 CFM (medium fan speed)
  - 120 CFM (high fan speed)

* Tested in accordance with ESD STM 3.1-2000

**PulseBar® and PulseFlow® Controller**

**DESCRIPTION**

The PulseBar eliminates troublesome electrostatic charges. Featuring a slimline yet rugged design, the versatile PulseBar can be installed on many types of equipment. The PulseBar can be operated in Steady State or Pulsed DC operating modes. It is powered by the PulseFlow Controller and easily maintained. Available in standard lengths from 12" to 74".

**PulseFlow Controller (PFC-20)** can power up to 20 electrode pairs. The PFC's design is user adjustable to both Pulse and Steady State DC separating modes. Controls are on the front panel for easy access and mounting. It allows independent voltage level control and provides four different pulse rates.

**FEATURES**
- Extended range
- Slim design for easy mounting in restricted space
- Quickly reduces static charges
- Simple to maintain
- Choice of Germanium or tungsten emitters

**SPECIFICATIONS**

- PulseBar
  - Size - 0.95" x 1.2" x varied length  
  - 2.4 cm x 3.0 cm x varied length
  - Cable Length - 7 ft (2.1 m)
- Material - ABS plastic/anodized aluminum
- Emitter Points - Germanium for ultra-clean requirements; 100% tungsten for Class 1 compatible

**PulseFlow Controller (PFC-20)**

- Size - 5.75" x 5" x 1.65" (L x W x D)  
  - 14.6 x 13.7 x 4.2 cm
- Weight - 22.5 oz. (700 g)
- Input Voltage - 100 to 120 VAC/200 to 240 VAC, 50/60 Hz, as required

**LABRAT®**

**DESCRIPTION**

The labRAT is a bi-polar air ionizer designed to control electrostatic problems associated with the use of precision balances. Applications include tools, mini-environments and flow-hoods. The unit’s aerodynamic shape minimizes disturbance of airflow in the environment.

The labRAT is simple to install, operate and maintain. It comes complete with a 24VDC power supply. A convenient swivel stand is included for tabletop use and the stand allows mounting on a wall or under a shelf.

**FEATURES**
- Fastest static control
- Easy to install and operate
- Compact design

**SPECIFICATIONS**

- Discharge Time - < 5 seconds at 2 ft (5.1 cm)
- Power Input - 24VDC
- Connectors - 5.5 x 2.5mm, DC power IN
- Indicator - Green-Power On
- Emitter Points - Germanium Emitters
- Enclosure - Polyurethane
- Dimensions - 3.0" x 1.9" x 3.8" (H x W x L)  
  - 7.5 x 4.8 x 9.8 cm
- Weight - 26 oz (727 g)

**Model Numbers**

- labRAT, 100-120V  . . . .4009928  
  - 230V  . . . . . . .4010090
- labRAT, 100-120V  . . . .4009928  
  - 230V  . . . . . . .4010090

**For additional information visit www.simcoION.biz, email us at info@esimco.com or call 215.997.0590**
**DESCRIPTION**

The Chapman brand VSE 3000 Volume Static Eliminator (manufactured by SIMCO) is an efficient workstation ionizer which effectively eliminates electrostatic charges quickly and reliably. The VSE 3000’s variable speed fan and integral air flow diffuser floods the entire workstation with static eliminating ions. The VSE 3000’s patented self-balancing circuitry maintains a balance range of 0 +/- 5 V. Exceptionally quiet, the unit delivers a powerful air flow with low energy loss. Noise levels are low due to the use of sound absorbing materials.

**SPECIFICATIONS**

- **Discharge Time**: ~< 2.0 sec (1000 V to 100 V) at 12”
- **Size**: 12” X 6.25” x 10” (W x H x D)
- **Weight**: 8 lbs. (3.6 kg.)
- **Air Volume Output - Variable**: 80 to 160 cubic ft/min (38 to 76 liters/sec)

**Model Numbers**

- 115 V ................. 10735-001
- 230 V ................ 10735-014

**ACCESSORY NUMBERS**

- Air Filters (5 each) ... 10790

* Tested in accordance with ESD-STM 3.1-2000

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**DESCRIPTION**

SIMCO’s miniION 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 miniION features self-monitoring to ensure controlled, consistent ion output. Performance is enhanced by SIMCO’s patented radial emitter pin array. Unique geometry and airflow control provide next-generation performance, meeting the demands of critical equipment manufacturers with corona ion technology.

The standard miniION configuration allows for incoming air from the back, two sides and the top of the enclosure. In an optional configuration, the back is completely closed and air enters from the two sides and top of the unit. This configuration is especially useful for space-constrained applications, allowing the miniION to be mounted flush against a wall or equipment enclosure housing.

**SPECIFICATIONS**

- **Discharge Time**: ~< 2.0 sec (1000 V to 100 V) at 12’’
- **Size**: 5.5” X 6.37” X 2.18” (W x H x D)
- **Weight**: 5 lbs. (2.3 kg.)
- **Offmax Voltage**: ± 10 V
- **Air Volume**: Low Fan Speed: 17 CFM (23 l/sec);
  High Fan Speed: 34 CFM (42 l/sec)
- **Fan Speed**: Low Range
- **Coverage Area - 1’ X 4’**

**Model Numbers**

- miniION................. 4009018
- Close Back Open
  N.A.M .......... 4009155
  Cont. Euro. .... 4009049

**ACCESSORY NUMBERS**

- Articulated Arm .... S051141

* Tested in accordance with ESD-STM 3.1-2000
**Ionizing Air Guns And Nozzles ... Top Gun™ and orION™**

**DESCRIPTION**
SIMCO'S Top Gun is a high-performance ionizing air gun for electronics manufacturing. Balanced to +/-15 V, the Top Gun features high blow-off force to provide efficient cleaning and rapid static charge decay. A 0.01 micron filter at the exit of the gun ensures the air is clean.

The gun body is lightweight but durable. It features a light-touch trigger, making comfortable even for extended use. All functionality is built into the handle: flow control valve, balance adjustment for calibration, and a two-level LED which indicates both power and ionization. The gun and cable are static dissipative. A hanger is provided for easy mounting.

**FEATURES**
- Filter at gun exit to ensure clean air
- PulsePoint Nozzle
- Airsnake - 16.5” (42cm) length
- PulsePoint Nozzle
- Easy installation
- Remote activation of ionization and fast charge neutralization
- Airsnake - 0.8 SCFM at 10 PSI; 5.5 SCFM at 100 PSI
- Ionization verification indicator light
- Adjustable airflow control
- 7.4 SCFM at 100 psi (210 l/min at 7 bar)

**SPECIFICATIONS**
- Discharge Time* - <1.3 sec. at 6”
- Weight - 6.5 oz. (185 g.) (integral gun and 7” cable) / 10 lbs. complete
- Air Flow:
  - 2.4 SCFM at 30 psi (68 l/min at 2 bar)
  - 4.6 SCFM at 60 psi (130 l/min at 4 bar)
  - 7.4 SCFM at 100 psi (210 l/min at 7 bar)

**MODEL NUMBERS**
- Cable (ft) Voltage Number
  - 7 120V, 50/60Hz 4005105*
  - 14' 120V, 50/60Hz 4006599*
  - 7 230V, 50/60Hz 4005106
  - 14' 230V, 50/60Hz 4006600

**PULSEGUN® 5**
**PULSEGUN® 8**
**DESCRIPTION**
The AirSnake, PulsePoint Nozzle, PulseGun 5 and PulseGun 8 all utilize ionizing blow-off power to rapidly neutralize static charge in seconds and keep particles from contaminating product surfaces.

**SPECIFICATIONS**
- Discharge Time* - <2 sec. at 6”
- Size and Weight - <2 sec. at 6”
- Air Flow:
  - Inlet pressure 5 PSI
  - SCFM at 10 PSI 1.5 0.8
  - SCFM at 50 PSI 6.5 5.5
  - SCFM at 100 PSI 13.5 11.5

**MODEL NUMBERS**
- PulseGun 5 : 4005187
- PulseGun 8 : 4005186

**PULSEGUN® 5**
**PULSEGUN® 8**
**DESCRIPTION**
The AN PulsePoint Air Nozzle (AN) fits at the end of a compressed air line to provide focused clean ionized stream onto a targeted location. The AirSnake uses a 0.02 micron filter. Powered by the AirFlow Controller, it can be mounted anywhere. The AS-2 nosecone meets OSHA requirements and contains easily replaced Class 1 emitters. The AirSnake 2 (AS-2) includes a foot pedal for on/off air control.

**SPECIFICATIONS**
- Discharge Time* - <0.5 sec. at 6”
- Flow Rate:
  - Inlet pressure 5 PSI
  - SCFM at 10 PSI 1.0 0.8
  - SCFM at 50 PSI 6.5 5.5
  - SCFM at 100 PSI 13.0 11.5

**MODEL NUMBERS**
- AN PulsePoint Nozzle - 1.0 SCFM at 10 PSI; 6.5 SCFM at 50 PSI; 13.5 SCFM at 100 PSI
- PulseGun AN - 1.0 SCFM at 10 PSI; 6.5 SCFM at 50 PSI; 13.5 SCFM at 100 PSI
- PulseGun PGS PG8

**orION™ SIDEKICK - HANDS-FREE OPERATION & FLEXIBLE POSITIONING**
The Sidekick flexible neck frees the operator’s hands during assembly and manufacturing processes. A foot pedal controls both ionization and air flow, which reduces compressed air costs. The flexible gun mount allows the orION operator to focus the ionization airflow where needed. Includes bracket for easy benchtop mounting. The Sidekick’s model numbers are 4009245 (230 V) and 4009246 (230 V).

**DESCRIPTION**
The AirFlow Controller provides power and control of ion balance to the PulseGun, AirSnake, and PulsePoint Nozzles. It has independent voltage level controls and Pulse or Steady State DC indicator lights. A silent switch incorporated into the Controller allows voltage to be applied to the ionizer only when there is air flow. All controls are located on the front panel to accommodate mounting above or below any work area.

**SPECIFICATIONS**
- Size - 5.75” x 5.1” x 1.65” (L x W x D) (14.6 x 12.7 x 4.2 cm)
- Weight - 22.5 oz. (700 grams)
- Input Voltage - 110/120 VAC/220 - 240 VAC, 50/60 Hz as required
- Pulse Rate Dial Position - 10 Hz, 2.2 Hz, 1.3 Hz, 1.0 Hz, SS
- Inlet and Outlet Fitting - 1/4” tube, push-in type

**MODEL NUMBERS**
- AFC-2/230 - 4005187
- AFC-2/230 - 4005186

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For additional information visit www.simcoION.biz, email us at info@simco.com or call 215.997.0590.