

# Critical Environment Ionizer & Wave Distortion Technology

## State-of-the-Art Ionizer Designed for Critical Environments



Since our introduction of the first overhead ionizer in the market more than ten years ago, we have continued to enhance and expand our offerings with the most advanced features available. Desco's latest offering, the C/E (Critical Environment) Overhead Ionizer is a state-of-the-art ionizer designed for critical applications.

The C/E series (Item #60478, 24" - Item #60479, 48") offers many design improvements, most notably, our patent pending "Emitter Cassette". While other manufacturers attempt to simplify or automate the cleaning of the emitter pins, what remains is one major flaw in the process -- unless the ionizer is removed to another area, the contamination ends up on the workstation and any product that happens to be nearby. The C/E series solves this problem. When the emitters need to be cleaned, the cassettes are easily removed from the unit and taken to another area to be cleaned. This takes the dirt away from the workstation and minimizes interruption of the work process. To further minimize downtime, a spare set of clean emitter cassettes can be dropped in and the others are cleaned when convenient. This concept is so unique, that we have applied for a patent on it.



Replaceable Emitter Cassette

In addition to the removable emitter cassettes, the C/E Ionizer provides a number of unique features and benefits:

- **Closed-loop feedback electronic balance system continuously monitors output for best performance.**  
Each fan stack is individually monitored and the output is electronically balanced to compensate for changes as emitters wear or get dirty. By measuring actual ionization output, a much tighter control of balance can be maintained.
- **I/O port allows auto-calibration and remote status monitoring.**  
This multi-purpose RJ45 connector provides a 3-state analog output

voltage indicating whether the unit is "OFF", "IN BALANCE", or "IN ALARM". If the user has an existing facility monitoring system for temperature, or particle counts, etc., this signal can be used, with the proper sensors and cables, to allow monitoring of the ionizer status.

The other function of the I/O port is to allow automatic calibration of the ionizer when used with a feedback device. Cables are available to connect popular charged plate monitors to this port.

Contact Desco for details. When the feedback device is connected, the ionizer will self-adjust as necessary to achieve optimum balance. If the device is disconnected, the non-volatile balance circuit maintains its setting. Using the feedback device, units can be re-calibrated in a matter of minutes.

- **Sealed plenum chamber around each fan minimizes contamination.**

Each fan/emitter assembly is a sealed chamber, insuring that incoming air is not contaminated by any internal components. The bulkhead on each side of the fan is sealed with a gasket to the cover.

- **Non-volatile adjustments for balance and fan speed are maintained in the absence of power.**

Realizing that many applications are not running 24 hours a day, we have provided "memory" settings on the balance and fan speed controls. With this feature, the unit can still remain "Locked" from an adjustability standpoint, while returning to the previous setting when power is re-applied.

- **Lockout key with distinctive front panel indicator prevents unauthorized adjustment.**

The supervisor key can be removed in the "OFF" or in the "LOCK" position. In the "SET" position, the fan speed and balance are adjustable and the key cannot be removed. While in the "LOCK" position, a distinctive bright blue LED is illuminated on the front panel, making it obvious from a distance that the unit is locked.



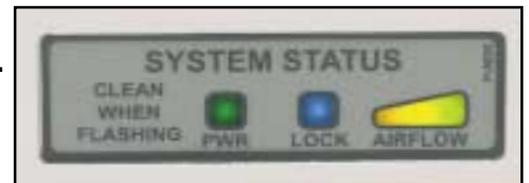
Lockout key

- **Balance individually adjustable at each fan zone.**

Many workstations are more than just an empty bench. Often times there are machines or other objects on the bench which will affect the balance in certain areas. The ability to adjust the balance for a particular zone allows the user to overcome this problem and to "customize" the ionizer to the workstation.

- **Flashing front panel signal indicate when cleaning is needed.**

When the closed-loop balancing system approaches its adjustment limit, the green "PWR" indicator on the front panel will turn red and begin to flash.



Front Panel Display

- **IEC input and output connectors allow daisy-chaining of up to 10 units.**

When many units are installed end to end, the ability to daisy chain will simplify the powering of up to 10 units. Any standard IEC inlet/outlet extension cord can be used.

- **Stainless steel and powder-coated aluminum construction for durability.**

In the interest of contamination control and ultra-low maintenance, we have used stainless steel and epoxy clad aluminum in the construction of the C/E ionizer. Corrosion in humid environments is eliminated.

- **Multiple high output fans provide more consistent and wider coverage.**

Our years of experience in the design and manufacture of overhead ionizers along with considerable customer input told us that this is the most effective configuration. The 2 center fans on the 48" model provide superior performance in the central "hot spot" of the workstation.



Full Time Continuous Monitor, Item #19210

## Desco Uses Superior Wave Distortion Technology

### Advantages of Workstation Continuous Monitoring Over Periodic Testing

Many customers are eliminating periodic testing and utilizing workstation continuous or constant monitoring to better ensure that their products are manufactured in an ESD controlled environment. Workstation continuous monitoring is superior to periodic or pulsed monitoring, as well as testing, and can save a significant amount of money in testing costs and rejected product. Periodic testing detects failures after ESD sensitive products have been manufactured. The costs of dealing with the resulting catastrophic or latent defects can be considerable. Workstation continuous monitors eliminate the need for users to test wrist straps and log the results; by their function, these monitors satisfy the ISO 9000 test logging requirement.

### Wave Distortion Detection Technology Provides True 100% Continuous Monitoring

From all the technical alternatives available, Desco has chosen wave distortion technology for all its continuous monitor product offerings. Wave distortion circuitry monitors current/voltage phase shifts and provides true 100% continuous monitoring. Electrical current will lead voltage at various points due to the combinations of resistance and capacitive reactance. By monitoring these “distortions” or phase shifts, the wave distortion workstation continuous monitor will reliably determine if the circuit is complete.



Dual Operator Workstation Continuous Monitor, Item # 19208

This wave distortion technology is also known as “vector impedance monitoring”. This description is valid as the wave distortion technology measures the impedance at the monitored banana jack and looks for changes in either the capacitance or resistance of the circuit which includes the wrist strap and its wearer. It uses filtering and time domain sampling to filter out false signals caused by voltage offsets, 60 Hz fields and other electro-magnetic and electrostatic interference.

Under normal factory environments, and with persons whose capacitance with respect to ground are within design limits (5 feet tall 90 pound person to 6 foot 5 inch 250 pound person), our workstation continuous monitors cannot be “fooled”. They will provide a reliable alarm only when the wrist strap or work surface becomes dysfunctional or unsafe according to accepted industry standards. The

Continuous Monitors are drift-free and designed to be insensitive to the effects of squeezing or stretching the coil cord.



Workstation Continuous Mini Monitor, Item# 19212

### Advantages of Wave Distortion & Single-Wire Technology

Desco Workstation Continuous Monitors allow the use of any standard, single-wire wrist strap and coil cord. The monitor/wrist strap/cord system life-cycle costs are by far lower than alternative systems which require expensive and fragile dual-wire cords and special wrist straps. Dual-wire cords are expensive and are the weak link of the system, the most likely component to need replacement. **Over a five year period, this can make the dual-wire system three to five times as expensive as a system utilizing single-wire wrist straps and cords.**

*Return Service Requested*

The dictionary defines constant as uniform and unchanging, and continuous as uninterrupted. Nonetheless, some dual-wire resistance monitors, utilize a pulsed test current and do not really provide continuous monitoring. For example, during each 2.2 second pulse cycle of a leading "constant" resistive monitor, electrical current is pulsed for only 0.2 seconds followed by an unmonitored interval of 2 seconds. This leaves the user/wrist strap unmonitored for over 90% of each cycle. Damaging static charges can easily occur in the portion of the time in-between the pulses. The off period of 2 seconds equals 2 billion nanoseconds, and "it takes only about 25 volts applied for 100 nanoseconds to blow most memories or microprocessors". Damaging static charges can easily occur in the

portion of the time in between the pulses. The dual-wire system does not reliably meet all industry specifications, as the cords do not meet the EOS/ESD Association guidelines for the 1 to 5 pound "breakaway force" requirement for operator safety.

By using the reliable wave distortion technology to determine if the circuit is complete, there are no false alarms. There is no need to adjust or tune the monitor to a specific user or installation. The miniscule amount of electrical current required to generate the waveform has never caused reported skin irritation and is extremely safe for use in voltage sensitive applications such as disk drive manufacturing.

## FEATURES AND BENEFITS OF DESCO WAVE DISTORTION TECHNOLOGY

### FEATURES

*Real-time monitoring of ESD workstation including wrist strap, mat, and cords.*

*Utilizes reliable wave distortion technology.*

*Can use with any brand of single-wire wrist strap and cord.*

*Miniscule electrical current required to generate waveform.*

*Designed for use by 5 foot tall 90 pound to 6 foot 5 inch 250 pound person.*

*AC adapter powered*

*Provided with factory calibration or traceable to NIST standards; optional unit offered for users to calibrate in their facility.*

### BENEFITS

*Ensures product manufactured in ESD controlled environment reducing catastrophic and latent defects*

*Provides true 100% continuous monitoring. Cannot be fooled; no false alarms. Not pulsed current that's off over 90% of the time.*

*With less expensive, more durable single-wire components, life-cycle costs of monitor/wrist strap/cord can be 66% lower than dual-wire approach.*

*No reported case of skin irritation.*

*Tuning for operator or installation available, but needed only for very special situations.*

*Versatile; able to use in any location.*

*Simple means to assure accurate performance.*