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Looking for Commercial / Industrial HVAC Service?

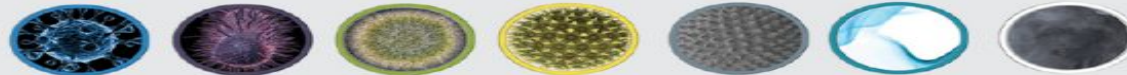
Dillett Mechanical Wisconsin's heating & air conditioning (HVAC) experts!

[CLICK HERE TO CONTACT US OR CALL DILLETT MECHANICAL AT 262-650-0770](#)

IAQ

Indoor Air Quality (IAQ)

On average, people spend 90% of their time indoors. And, according to the US Environmental Protection Agency, the air inside our homes, schools, and offices is often two to five times more polluted than the outside air. Pollutants in the air inside our homes can include pollen, dust, mold, odors, Volatile Organic Compounds (VOCs), smoke, and harmful microorganisms including mold, bacteria, and viruses.



Ions are Essential to Healthy Indoor Air Quality

Ions are essential to the natural process of air purification and essential to healthy living. Typically, clean outdoor air contains 2000–3000 ions per cubic centimeter. Inside a building with natural ventilation, the number of ions drops below 500 ions per cubic centimeter, and in most buildings with ducted air-conditioning systems, air ion levels above 100 ions per cubic centimeter are rare. These low ion environments often contribute to fatigue, exacerbate breathing issues, and contribute to overall poor health.

Residential / Commercial Indoor Air Quality

Phenomenal Aire
Cold Plasma Generator Technology



Residential / Commercial Indoor Air Quality

Phenomenal Aire™ cold plasma generator technology produces billions of ions.



How the Technology Works

Phenomenal Aire™ Cold Plasma Generator (CPG) technology safely cleans indoor air. Phenomenal Aire™ is designed for installation in a home's Heating Ventilation and Air Conditioning (HVAC) system. The CPG Technology is Powered by Needlepoint Clusters™ and produces an electric field filled with billions of highly charged positive and negative ions. The ions attach to pathogens, particles, and gas molecules traveling in the airstream and act as a natural scrubbing agent. The scrubbing process (ionization) destroys harmful microorganisms, safely inactivates airborne pathogens including viruses and bacteria. The highly charged ions cause sub-micron particulates to be attracted to each other, making them easier to capture in existing filter systems. The ions breakdown harmful Volatile Organic Compounds (VOCs) into harmless compounds like O₂, CO₂, N₂, and H₂O. The ions produced by Phenomenal Aire™ travel through the airstream of the HVAC system into the living space where they can continue to clean the air and disable harmful pathogens on hard surfaces.

IAQ PA-R6.0

CPG Technology Powered by Needlepoint Clusters™

A single Needlepoint Cluster™ can generate up to 190 Million Ions



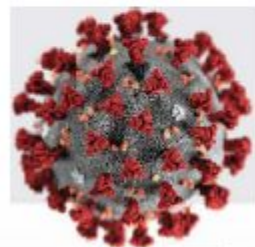
Assembled in the USA

Series R 6.0 & Stingers™ Generate 3 Billion ions



IAQ

A single Needlepoint Cluster™ can generate up to 190 Million Ions



Polluted Air

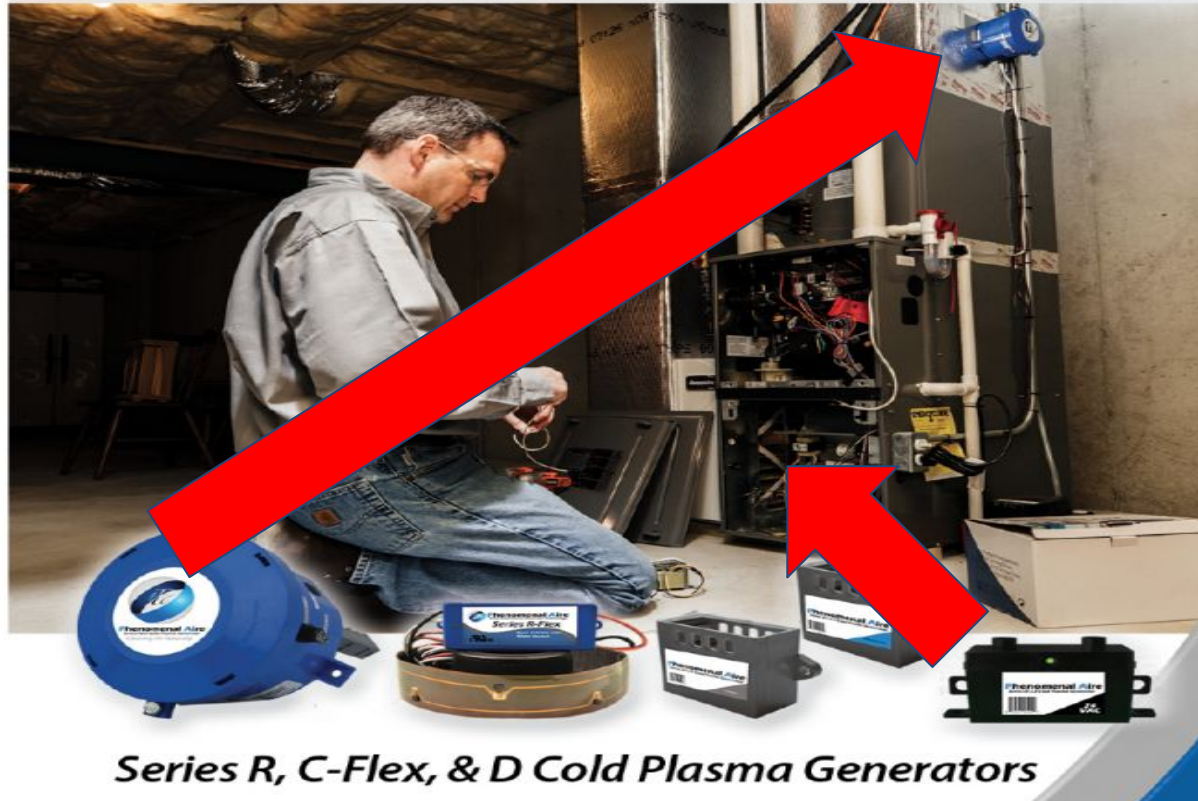


Series R

Clean Healthy Air

IAQ

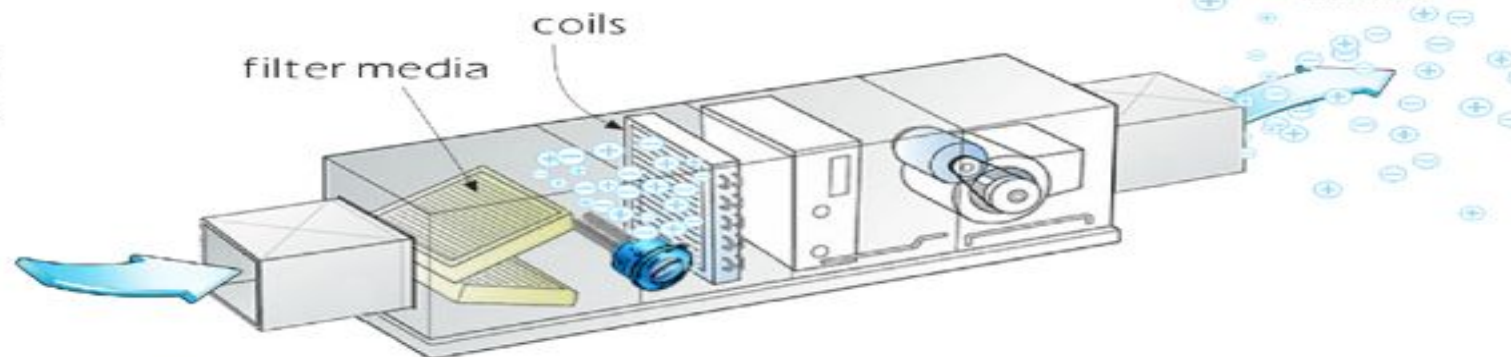
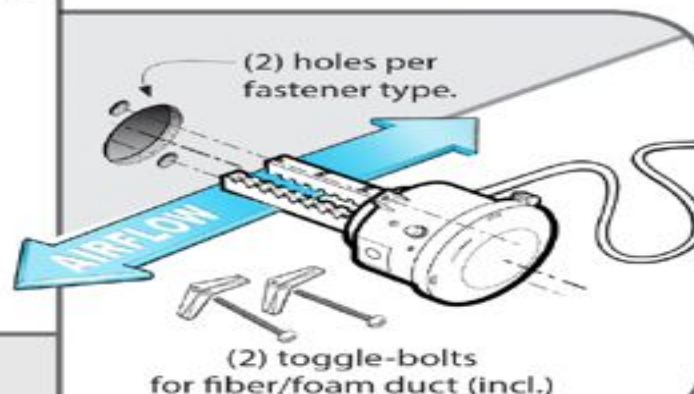
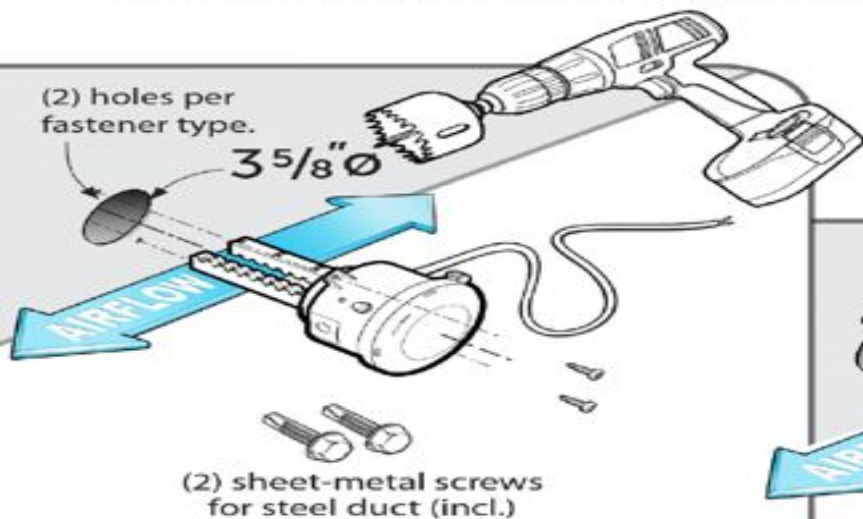
Easy to Install. Easy to Maintain.



Installation

Where to install your Phenomenal Aire Ion Generator:

Mount your ionizer so that the legs extend through a 3-5/8" hole in your duct wall, are oriented in line with air flow per diagram below, and that the ionizer body and mounting tabs are flush against the exterior face, ready for fasteners. Hardware is supplied for both metal and fiber duct construction.



Location

Best:

- After any particulate system filter, and **before** the cooling coil. Any system filter in place downstream of your ionizer may reduce the volume of ions from delivering maximum benefits to your living/work spaces. Free ions cause fine particulates to "clump together" and collect in your return-air filter media.

Your ionizer will also clean and protect your coils from contamination by bacteria, viruses and mold.

Good:

- After the cooling coil, in a dry, condensation-free area.
- At supply air discharge, beyond any final filtration.

Phenomenal Aire requires little or no maintenance!

To ensure lasting performance and maximum benefits:

1. In first year of operation, visually inspect quarterly. Clean away any construction dust that may have accumulated on stingers.
2. An annual visual inspection is recommended. Adjust inspection frequency per conditions of zones served.
3. If you see a build up of dust, spray needlepoints clean with a compressed gas duster available at a retail office supply. In cases of heavy dust build-up, use a soft cloth with isopropyl alcohol.
4. Your system's filters may gather a lot of dust following initial startup and subsequent first cleanup of air in zone serviced by your ionizer. Filter change frequency should normalize after 2 or 3 filter changes.

Trouble Shooting:

1. Green power "ON" light not lit: Verify 24v power supply functioning. Check fuse (under black twist-off cap).
 2. No ionization detected: Confirm legs are free of dust build-up.
- If power, fuse, and CPG legs look good, contact a local Phenomenal Aire rep.; Warranty, page 4.

Commercial / Industrial Indoor Air Quality

Phenomenal Aire Cold Plasma Generator Technology

Specify Phenomenal Aire™ on your next project!

Phenomenal Aire™ cold plasma generator technology is proven air cleaning technology with thousands of commercial installations. Phenomenal Aire™ cleans air safely and is endorsed by leading manufacturers of HVAC equipment with global brand recognition.

Unit Application Quick Select

	Series C-6.0	Series C-10.0	Series C-Flex	Series D 1.2-1	Series D 1.2-2	Series D 3.2
AHU/RTU 0-3,000 cfm	X	X				X
AHU/RTU 0-6,000 cfm	X	X				
AHU/RTU 0-10,000 cfm		X				
Fan Coil						
PTAC Unit			X	X	X	X
Mini-split System			X	X	X	X
Contact for BAS Communication	X	X	X	X	X	X
Adjustable Length			X			
ETL Listed Technology	X	X	X	X	X	X
ASHRAE 62.1 Compliant	X	X	X	X	X	X
UL-867 Compliant	X	X	X	X	X	X

Series C

Series C cold plasma generators are ideal for AHU and Rooftop unit installations. Series C 6.0 is rated for systems up to 6,000 CFM. Series C 10.0 is rated for systems up to 10,000 CFM. Series C units include an alarm contact for interfacing to a BMS. Units also include an integral LED for local operational status. Series C units do not require replacement parts and only require periodic inspections and cleaning.

- ETL Listed / UL-867
- Air Flow Capacity & Area of Coil Face Coverage—
 - C 6.0 0 to 6,000 CFM (4'X4' Coil Face)
 - C10.0 6,000 to 10,000 CFM (6'X6' Coil Face)
- Voltage – 16 to 35 VAC; Power with 24 VAC
- Pressure Drop – < 0.05" WC
- Power Consumption – 12 VA
- Needlepoint Probe Length – 6" & 10"
- Frequency – 50 Hz – 60 Hz
- Electrode – Carbon Resin
- Temperature Range – -20 F to 140 F
- Ionization Generation – Needlepoint Bi-Polar
- Ion Generation (Output)—
 - C 6.0 360 million ions/cc/sec per inch of Stinger™
 - C10.0 360 million ions/cc/sec per inch of Stinger™
- Ion Status - Green LED
- Humidity Range – 0-99%
- Mounting Box – ABS UL 94 Plastic



CPG Technology Powered by Needlepoint Clusters™

A single Needlepoint Cluster™ can generate up to 190 Million Ions

	Needlepoint Clusters™ Ion Generation	
Series C-6.0	16	3 Billion
Series C-10.0	32	6 Billion



Series D

Series D units are carbon fiber brush, needlepoint bipolar ionization generators rated for 1,200 to 3,200 CFM or up to 8 tons nominal capacity. Series D units are great for mounting in fan coils, mini-splits, chilled beams, water source heat pumps, RTUs or any other forced air systems. Series D 3.2 includes an alarm contact for interfacing to a BMS. It also includes an integral LED for local operational status.

	Series D CPG selections		
	D 1.2-1	D 1.2-2	D 3.2
Input Voltage	115 VAC	208-277 VAC	24 VAC
Power Required	2 VA	2 VA	12 VA
Frequency	50/60HZ	50/60HZ	50/60HZ
Capacity	1,200 CFM	1,200 CFM	3,200 CFM
Unit Dimensions	2.2"L X 1.6"H X 1.0"D	2.2"L X 1.6"H X 1.0"D	2.6"L X 1.9"H X 1.3"D
Weight	0.25lbs	0.25lbs	1lbs
Electric Approvals	UL Listed	UL Listed	UL Listed
BMS Alarm Contact	NA	NA	"Dry Contact" 3A/11V Maximum



Series C-Flex

Series C-Flex from Top Product Innovations is a highly versatile ion device that is designed to be installed on the cooling coil in ductless AC systems or PTACS. The device requires no replacement parts and it can be integrated into wall or ceiling cassette indoor coils of ductless mini-splits, PTACs or other systems where there may not be enough room to install other indoor air quality products between the filter and coil. The 18" inch flexible ion bar can be used on coils up to 30 inches wide. The 36" inch flexible ion bar can be used for coils up to 48" inches wide

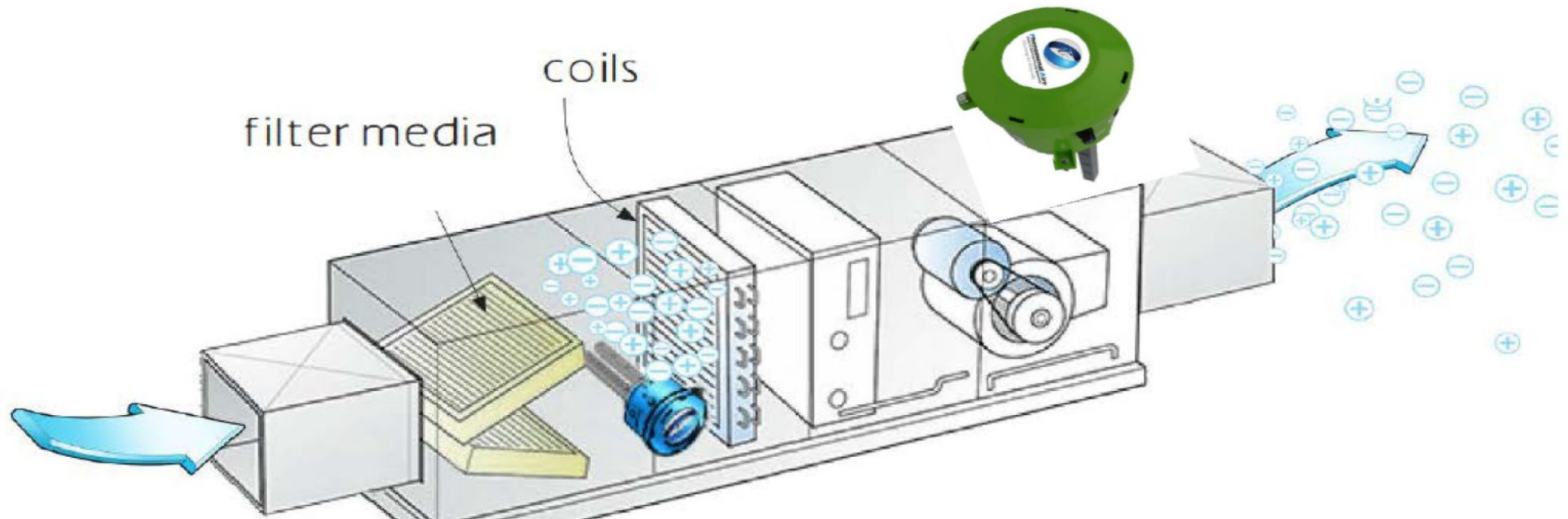
Specifications:

Input Voltage:	120VAC to 240VAC
Input Power:	5 Watts
Power: Frequency:	50/60 HZ
Output Voltage:	2KV
Output Current:	1mA
Dimensions (Power Supply):	1"H x 1.75"W x 3.75"L
Dimensions 36":	1.5"W x 36"L x 0.05"H
Dimensions 18":	1.5"W x 18"L x 0.05"H
Power Supply Weight:	0.5 lbs
Model Number String:	C-Flex 18 or C-Flex 36
Electrical Listings:	UL, cUL
Alarm Contacts:	"Dry Contact" / LED Status

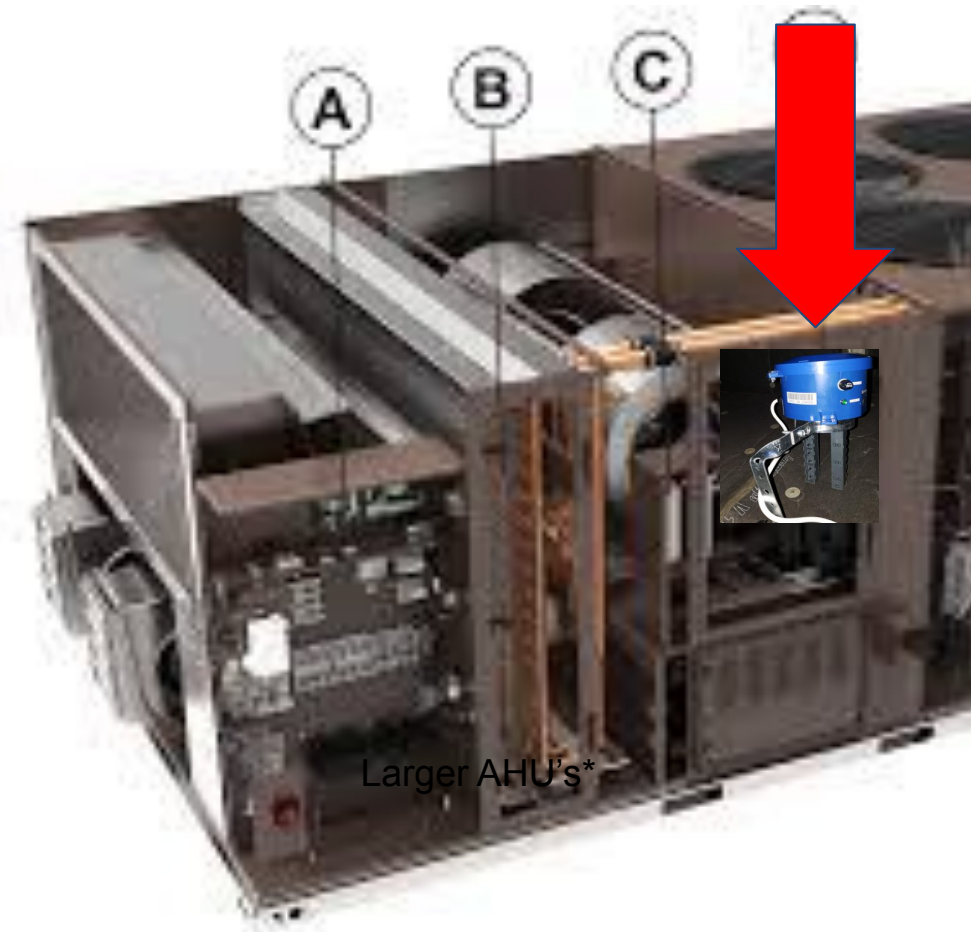


IAQ for HVAC Forced Air Systems

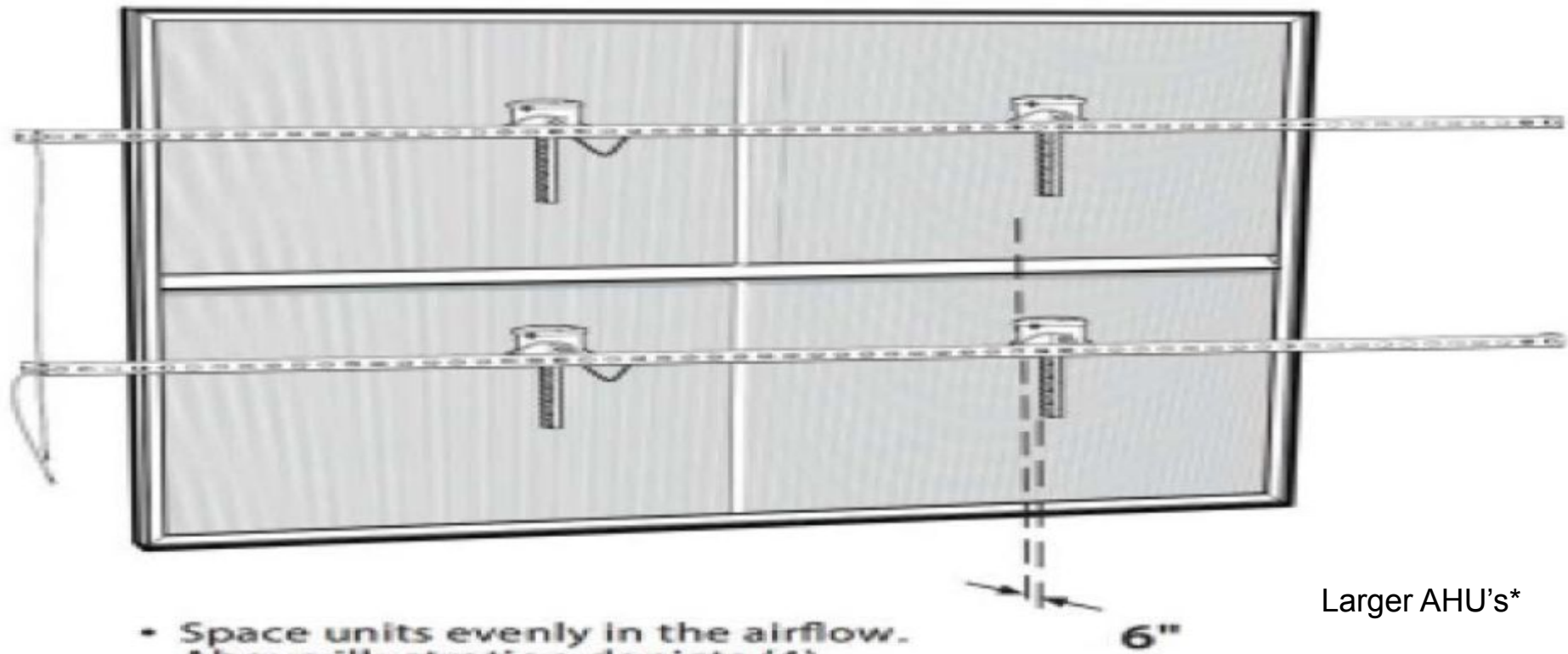
Note:For best iOn output into the space put unit on supply side after coil, or one before and after coil to treat both the space and coils.



Note: Testing done by third party, contracted by manufacturer and not EER.



IAQ For RTU's, Air Handlers, ETC.



- Space units evenly in the airflow. Above illustration depicts (4) units positioned appropriately.

Larger AHU's*

IAQ For Mini-Splits, PTAC's

Product Specifications & Installation Guide Series C-Flex

Rev 08202020

The Series C -Flex from Top Product Innovations is a highly versatile ion device that is designed to be installed on the cooling coil in ductless AC systems or PTACS. The device requires no replacement parts and it can be integrated into wall or ceiling cassette indoor coils of ductless mini-splits, PTAC units or other systems where there may not be enough room to install other indoor air quality products between the filter and coil. The 18" inch flexible ion bar can be used on coils up to 30 inches wide. The 36" inch flexible ion bar can be used for coils up to 48" inches wide. For coils beyond the ionizer length, center the ionizer on the coil to make sure the ionization best covers the coil width. Simply peel off the paper backing to the ionization bar and stick it across the width of the coil. Connect the appropriate leads of the device to 110VAC to 240VAC, peel off the power supply paper backing and mount. Reassemble the equipment and turn on power to the unit.

Ductless Mini-Split and PTAC Mounting & Wiring Instructions:

1. Turn power off to the ductless mini-split or PTAC.



Series C-Flex

Specifications:	120VAC to 240VAC
Input Voltage:	5 Watts
Power: Frequency:	50/60 HZ
Output Voltage:	2KV
Output Current	1mA
Dimensions (Power Supply):	" 0"H x 2 0"W x 3"L
Dimensions 36":	1.5"W x 36"L x 0.05"H
Dimensions 18":	1.5"W x 18"L x 0.05"H
Power Supply Weight:	0.5 lbs
Model Number String:	C-Flex 18 or C-Flex 36
Electrical Listings:	UL, cUL
Alarm Contacts:	"Dry Contact" / LED Status
CFM Rating	18" 1800 CFM
	36" 3200 CFM

Installation, Operation and Maintenance Manual

How to Reduce the Length of the Flexible Ion Bar Continued:

5. Continue to use electrical tape down the ion bar towards the end, making sure that the tape joints are between the brush pairs. DO NOT allow the tape to cover the brush pairs. See Figure 4.
6. DO NOT crease the end of the ion bar flat. As a guide, use a #2 Phillips screwdriver inside the fold joint to ensure the proper bend is achieved. See Figure 5.
7. Once the flexible ion bar has been folded and taped to the length required, push it down on the coil.
8. A successful fold procedure will create “pockets” for the carbon fiber brushes to emit the ions.

Figure 4



Figure 5



Figure 6 - Typical Ductless Mini-split Installation

Secure power supply to back of cabinet.



Specifications:

Input Voltage:

120VAC to 240VAC

Power:

5 Watts

Mount ion device to top of coil surface or plastic strip, if available.

Results!

CPG Technology Powered by Needlepoint Clusters™

A single Needlepoint Cluster™ can generate up to 190 Million Ions



Library:

Pre-test particle counts taken in the Library of [REDACTED] Elementary showing 5,903 particles at 0.3um (Microns) post-test counts showing only 991 particles at 0.3um! A reduction of 4,911 particles! or a 83.2% reduction! We focus on particle count at 0.3um as they are the Most Penetrating Particles (MPPS)

Pre-test Particle Counts

0.3um	5903
0.5um	1298
1.0um	204
2.5um	14
5.0um	2
10um	2

Post-test Particle Counts

0.3um:	991
0.5um:	306
1.0um:	74
2.5um:	13
5.0um:	2
10um:	2

A person wearing a white lab coat is working with a piece of equipment that has various tubes and components. The background is a solid blue color.

Testing Against Mold!

Phenomenal **A**ire

Series R Cold Plasma Generator

Mold Testing

Testing Against Mold!

Test Details



Series R-6 Cold Plasma Generator
0-6,000 CFM rated capacity



30+ day mold study"



Room set-point F°



4 oz of H₂O



7" -- H₂O to center slice



32 grams/slice processed bread



5 gallon sealed cube
12.5" X 10.5" X 20"

Testing Against Mold!



Results Against Mold!



Results Against Mold!

Phenomenal Aire
Cold Plasma Generator Technology



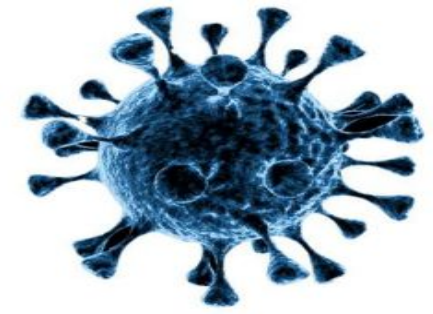
Untreated



**Day
30**

EFFICACY AGAINST SARS-CoV-2 (COVID-19) VIRUS

This in vitro study was to characterize the Phenomenal Aire series C6 Cold Plasma system and determine efficacy against the SARS COVID-19 virus. The Phenomenal Aire series model C6 is designed to deactivate viral pathogens on surfaces and in the air to sanitize enclosed areas.



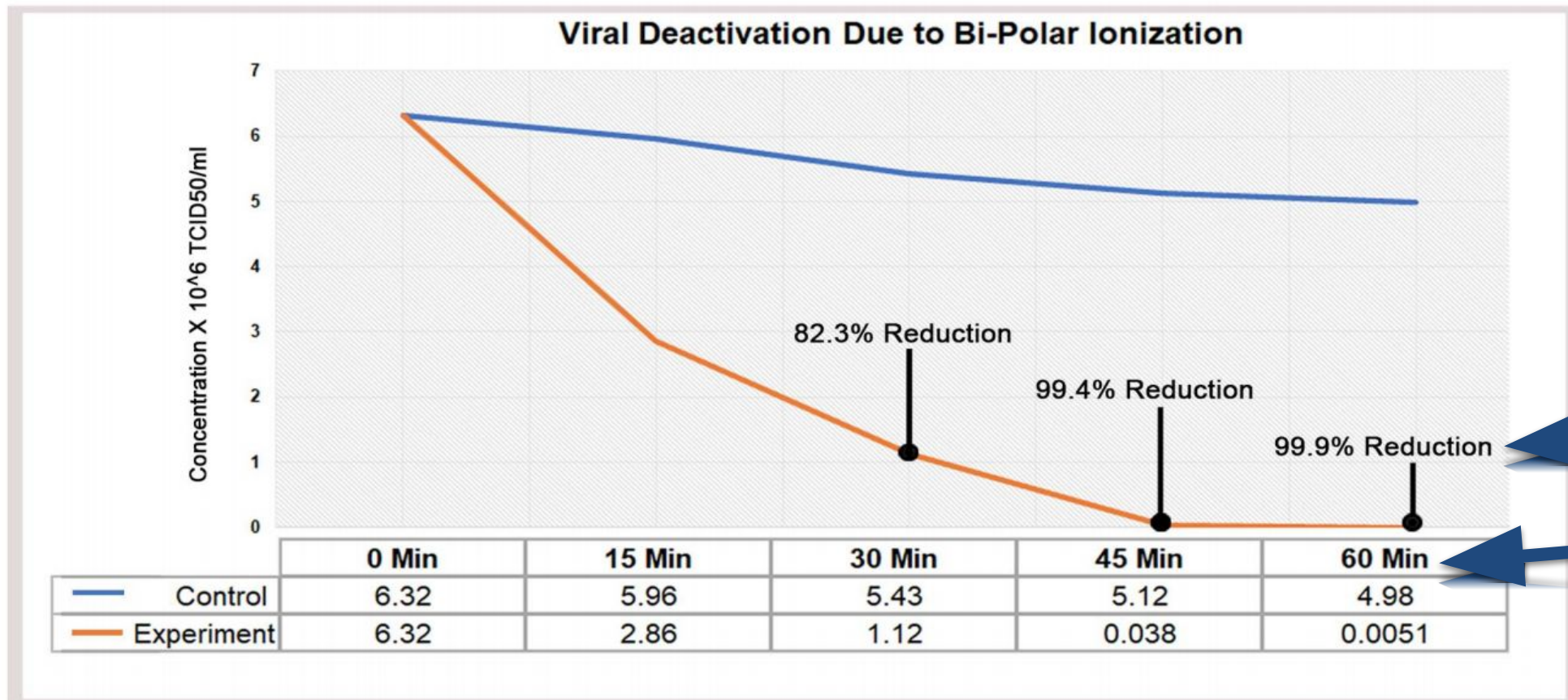
EXPERIMENTAL DESIGN

A custom designed metal container 72"x30"x30" was used for a direct inoculation testing site. The testing chamber had directed extraction exhaust vent on the top of the container with a HEPA filter to prevent accidental release of the viral media. During the course, of the test 2 AIC2 digital air ion counters were placed directly behind the sampling area and mapped ion levels for the duration of the test. One ion counter recorded negative ions being distributed and one recorded positive ions being distributed. The ambient air inside the container was 71.3F to 72.7F. During the control testing and the viral load tests the temperature fluctuation was consistent. The ambient humidity inside the test chamber was 44.1% and the airflow speed passing across the Aire Series C6 at the time of testing was averaged at 432 FT/M. During the control testing one fan was placed inside the chamber to create the same simulated air flow as the ionization unit.

- 4 stainless steel sample plates were placed 48" away from the center of the Ionization device down-wind from the airflow in an even row. Test pieces were inoculated with the virus by directly applying 1mL of viral media with a known concentration of 6.32×10^6 TCID₅₀/mL, spread evenly on the plate and allowed to dry in the testing area. After adequate drying time, 1 sample swab was taken from each test piece at a 15-minute time point, 30-minute time point, 45-minute time point, and 1-hour time point post inoculation
- Swabs were sealed in individual tubular containers containing 1mL viral transfer media and stored in a sealed box for the duration of the test so no further ions could interact with them.

IAQ Results!

Against Sars-Cov-2 (Causes Covid-19)



Questions & Answers about IAQ

Confused? Questions or comments on IAQ? Reach out to Dillett now!

tomdillett@dillettmechanical.com

