

Indoor Air Quality Solutions

GPS Bipolar Ionization Products

A REVOLUTIONARY TECHNOLOGY THAT FIGHTS PATHOGENS, PROVIDES CLEANER AIR, AND HELPS DELIVER GREATER ENERGY EFFICIENCY.

As experts in delivering solutions for healthy buildings, CM3 Building Solutions proudly deploys the Global Plasma Solutions (GPS) Needlepoint Bipolar Ionization (NBPI) technology for indoor air quality improvement.

For nearly a decade, CM3 has integrated Ionization Technology into ventilation systems. We have installed more than 50 systems in Pennsylvania and New Jersey.

This patented technology can be found in more than 250,000 installations worldwide.

WHAT IS AN ION?

An ion is a molecule or atom that is positively or negatively charged, meaning it must either gain or relinquish electrons in order to become neutral.

Naturally occurring ions are everywhere outdoors. They are created with energy from rushing water, crashing waves and even sunlight.

Ions are found in the highest concentrations where the ocean meets the shore and at high elevation in the mountains, up to 5,000 ions per cubic centimeter.

By comparison, buildings typically have less than 100 ions per cubic centimeter.

HOW NPBI WORKS

The NPBI technology creates the ions found in these desirable locations and supplies them into the building. Once in the airstream, the positive and negative ions surround air particles.

This added mass helps the air particles to fall to the floor and be pulled towards the building's air filter to be removed from the air.

The ions also pull hydrogen away from pathogens (i.e., virus, mold), altering the structure and essentially rendering the pathogen inactive.

GPS NPBI technology generates ions without producing ozone or other harmful byproducts.

WORKS FOR ANY BUILDING

The GPS diverse portfolio of products ensures compatibility with any ventilation system:

Designed for new or existing buildings

Brand Agnostic: Works with any ventilation system manufacturer

System Agnostic: Easily retrofitted to any type of ventilation system

- » Air Handling
- » Ducted
- » Ductless
- » Fan Coil Units
- » Rooftop Units
- » Unit Ventilators



IMPROVE INDOOR AIR QUALITY

GPS NBPI creates and releases ions into the airstream using your existing HVAC system as the delivery method. As these ions disperse throughout a space, they improve indoor air quality and save energy.

Targets Particles

When these ions disperse throughout a space, such as an office or a schoolroom, they combine with particles suspended in the air. This creates a snowball effect in which particles of opposite polarities begin to cluster together, which makes them easier to capture in filtration systems.

Targets Odors

GPS' NPBI technology breaks down chemical, pet, cooking and other odors into basic harmless compounds, leaving indoor air smelling fresh and substantially reducing odor-causing VOCs.

Reduces Pathogens

During the NPBI process, contact with ions disrupts pathogens' surface proteins, rendering them inactive and unable to replicate.

Saves Energy

By keeping indoor air cleaner, NPBI reduces the amount of air required from outside to keep things fresh - saving you initial ventilation equipment costs and up to 30% on energy consumption.

MERV 8 Filter + NBPI ≥ MERV13

Independent laboratory testing demonstrated that using a MERV 8 filter with GPS NPBI will have the same or better particle control than a system using a MERV 13 filter without NPBI.

This equates to fan energy savings and filter replacement cost savings.

ENHANCED INTELLECTUAL PERFORMANCE



According to Columbia University's Research on Ion Depletion, systems that add ions back to the indoor space have occupants who are more alert and perform better.

NPBI is installed in more than 80% of the Top 100 performing schools in Georgia, including the Top 10 Schools.

SUPERIOR TECHNOLOGY

	GPS NPBI	Other NPBI	Corona Discharge	Hepa Filters	Carbon Filters	Ultraviolet (UV)	UV-PCO
No harmful By-Products	X			X	X		
Reduces Airborne Particles	X	X	X	X			
Tackles VOC's	X	X	X		X		X
Reduces Pathogens	X	X	X	X	X	X	X
Reduces Energy Cost	X	X	X				
Treats In-Room Air	X	X	X				
No Replacement Parts	X						
No Maintenance	X						
Simple to Install	X						
Low Total Cost	X						

FLEXIBLE SOLUTIONS

GPS Products	Voltage	CFM Rating	Ions/ CC/SEC	Air Handling Units	Ducted Split Systems	Packaged Rooftop Systems	Ductless Mini Splits	VRF Cassettes	Fan Coil Units	VAV/Fan Powered Box
FC24-AC	24-240 VAC	2400	>300M	X	X	X	X	X	X	X
FC48-AC	24-240 VAC	4800	>400M	X	X	X			X	X
DM-48 AC	24-240 VAC	4800	>400M	X	X	X				X
FC-3-BAS	24 VAC	3200	>350M		X		X	X	X	
i-Mod	24-240 VAC	50-250 CFM/INCH	>140/IN	X		X				
IRIB-18	110-240 VAC	3200	>35M/ft				X	X	X	
IRIB-36	110-240 VAC	3200	>35M/ft				X	X	X	
DM-2	24-240 VAC	2400	>200M		X		X	X	X	X

PERFORMANCE VALIDATION

Specimen	Average Ion Density (ions/cc)	% Net Reduction	
		30 Minutes	60 Minutes
SARS-CoV-2	-10,000	40.78%	90.87%
	-18,000	65.38%	98.33%
SARS-CoV-2 Delta Variant	-22,000	63.71%	99.3%
Influenza A	-22,000	43.13%	84.53%
Influenza B	-22,000	32.71%	83.93%
RSV	-22,000	49.52%	94.71%

Airborne Organisms

GPS products are designed to work with air handling systems to deliver the benefits of ionization. These tests measure the reduction of certain airborne viruses and bacteria by aerosolizing a test specimen into a large biosafety test chamber (BSL2 or BSL3) and suspending it in the air using mixing fans. Measurements of the specimen are taken at regular intervals and compared to a control without the introduction of ionization.

Surface Organisms

GPS products are designed to work with air handling systems to deliver the benefits of ionization. These tests measure the reduction of certain viruses and bacteria on surfaces by applying a specimen to glass slides, petri dishes or coupons and placing them on a table within a large biosafety test chamber (BSL2 or BSL3). Measurements of the specimen are taken at regular intervals and compared to a control without the introduction of ionization.

Specimen	Average Ion Density (ions/cc)	% Net Reduction	
		30 Minutes	60 Minutes
SARS-CoV-2	-9,700	55.50%	62.85%
	-10,250	55.94%	70.71%
	-20,600	97.90%	99.97%
	-23,600	98.49%	99.98%
Staphylococcus aureus	-14,000	36.61%	91.55%
E.coli	-14,000	31.49%	86.36%
MRSA	-14,000	44.91%	87.87%

Airborne Particles

GPS products are designed to work with air handling systems to deliver the benefits of ionization. These test results demonstrate the additional reduction of particles in air when NPBI is combined with mechanical filtration versus filtration alone. Particles from calibrated cigarettes were infused into a 10ft. x 10ft. x 10ft. chamber to provide a starting point consistent with wildfire smoke simulation. Testing occurred at six air changes per hour (ACH), consistent with ASHRAE guidelines.

NPBI + MERV 8 removed PM1.0 twice as fast as MERV 8 alone, the first two hours after particles were introduced, based on triplicate experiments.

NPBI + MERV 10 removed PM1.0 over 1.5 times faster than MERV 10 alone, the first hour after particles were introduced, based on triplicate experiments.

The GPS NPBI technology was tested by Innovative BioAnalysis and Blue Heaven Technologies. Test parameters can be found at globalplasmasolutions.com

PRODUCTS

GPS-FC24-AC™

NPBI system that handles up to **2,400 CFM of 6 tons**. Designed for multiple mounting options including fan inlet, interior duct walls or floors. The composite construction allows for mounting in corrosive environments.

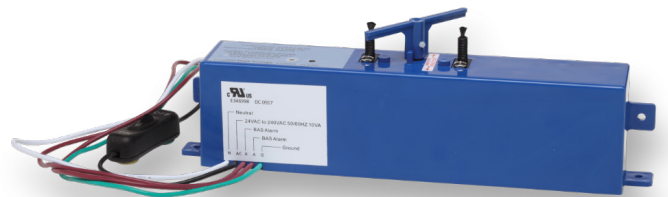
- » Multii-Voltage Input 24-240 AC/DC
- » Programmable Auto-Cleaning Cycle
- » Carbon Fiber Brush Emitters
- » Integral Building Automation System (BAS) Alarm Contacts
- » UL 2998 Ozone Free



GPS-FC48-AC™

NPBI system that handles up to **4,800 CFM or 12 tons**. Designed for multiple mounting options including fan inlet, interior duct walls or floors. The composite construction allows for mounting in corrosive environments.

- » > 400 Million + and – Ions Per cc/sec
- » Universal Voltage Input (24 – 240 VAC)
- » Programmable Auto-Cleaning Cycle
- » Carbon Fiber Brush Emitters
- » Alarm Contacts
- » UL 2998 Ozone Free



GPS-DM48-AC™

Duct-mounted needlepoint bipolar ionization (NPBI™) electronic air cleaner. The maintenance-free unit is designed for indoor or outdoor duct mounting and can handle up to **4,800 CFM or 12 tons**.

- » Universal Voltage Input 24–240 VA
- » > 400 Million +/- Ions/cc/sec
- » Programmable Auto-Cleaning Cycle
- » Carbon Fiber Brush Emitters
- » Integral Building Automation System (BAS) Alarm Contacts
- » 3/4 Quick-Turn Duct Adapter
- » 6-Foot Watertight Flexible Conduit
- » UL 2998 Ozone Free



DM-2

Designed for indoor duct mounting.

- » Multi-Voltage Input
- » Auto-Cleaning
- » Operation Status Display
- » Integral BAS Alarm Contacts
- » Quick Turn Duct Adapter
- » 1/2" hole for 3/8" Conduit Connector
- » Carbon Fiber Brush Emitters
- » UL 2998 Ozone-Free
- » CARB Compliant



GPS-FC-3-BAS™

Designed to be mounted inside fan coils, heat pumps, PTACs, ductless mini-splits, and air handlers up to **3,200 CFM or 8 tons**. Its compact size and simple mounting requirements allow it to be quickly mounted almost anywhere.

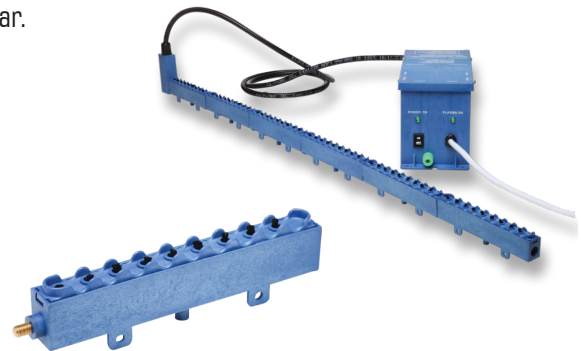
- » Carbon Fiber Brush Emitters
- » > 350 Million + and – Ions/cc/sec
- » LED Operation Status
- » Integral Building Automation System (BAS) Alarm Contacts
- » Powered by 24 Volts AC



GPS-iMOD®

Modular NPBI system that is field assembled to any length up to 240 inches in 6-inch increments. The fiberglass composite and carbon fiber GPS-iMOD can be mounted in corrosive environments. It can treat **50 – 250 CFM** per inch of bar.

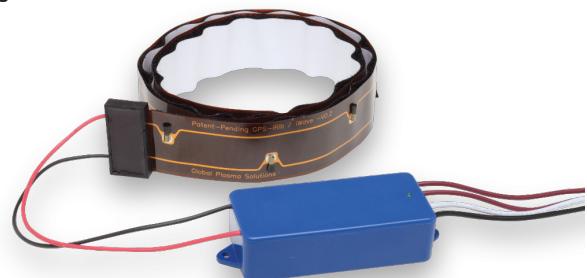
- » > 140 Million + and - Ions Per Inch/cc/sec
- » Universal Voltage Selector Switch
- » Six HV Output Ports
- » Alarm Contacts
- » Illuminated On/Off Switch
- » Plasma on Indication Light
- » UL 2998 Ozone Free



GPS-iRIB® 18/36

Available in 18" and 36" lengths. Made from a flexible chemical, heat and cold resistant Kapton® material containing a circuit with special carbon fiber ion emitters soldered into the circuit traces. This mechanism is engineered to deliver the highest level of ionization with the least amount of energy in the most compact size. Designed for **3200 CFM or 8 tons**.

- » > 35 Million + and - Ions Per Foot/cc/sec
- » Fold-To-Length Circuit
- » Local LED Power Indication
- » Integral Control Relay for BAS Interface
- » Velcro® for Easy Installation
- » Voltage Input 110VAC to 240VAC



ACCESSORIES

GPS-iMEASURE™

Permanently mounted in the space to measure ion levels in real time and report back to a BAS.

Monitor Ionization Levels Remotely

- » Auto Calibration/Auto Zero
- » 0 – 1,000,000 Ions/cc



GPS-iMEASURE-D™

Permanently mounted in the duct downstream of any GPS ionization device. It measures ion levels in real time and reports back to a BAS. Includes three sensitivity levels: 20,000/200,000/2,000,000 ions/cc/sec that can be set based on the application and in-duct location.

Monitor In-Duct Ionization Levels

- » 20,000 to 2M Ions/cc
- » Input Voltage 12 to 24V AC or DC
- » LED Operation Status



GPS-iDETECT-P™

Plenum-mounted ionization detector that confirms the output from the GPS-iMOD. Provides the ability to monitor ionization status in a plenum to confirm that the ionization equipment is working properly.

- » Universal Voltage Input
- » 1,000 – 200,000,000 Ions/cc (+ or -)
- » 0-100% Humidity



GPS-NEMA4-OE

NEMA 4X-rated fiberglass enclosure designed to house one GPS-iMOD power supply. The panel adds a superior finished look to any project while providing the required protection against foreign substances, such as water and dust, when power supplies are mounted in non-NEMA 1 rated environment.

