

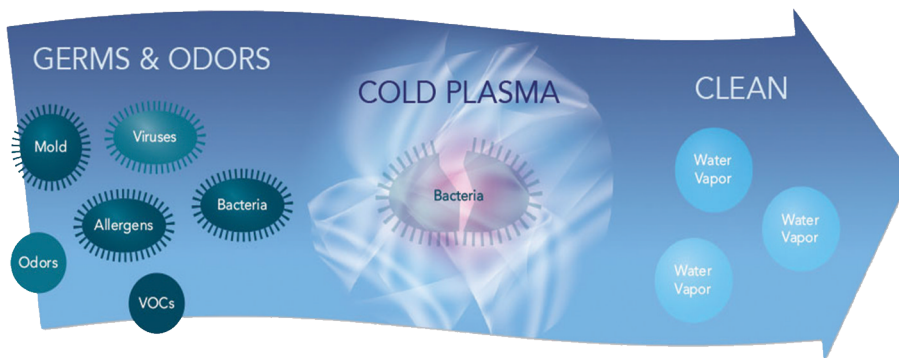


GPS

Engineering Air for a Better World™

How Ionization Works

GPS' advanced plasma air purification technology works to safely clean the air inside commercial and residential buildings. The patented technology uses a precise electronic charge to create an electrical field filled with high concentrations of ions. When these ions are injected into the air stream they break down passing pollutants and gases into harmless compounds like: oxygen, carbon dioxide, nitrogen and water vapor. When these ions come in contact with harmful pathogens such as virus, bacteria, or mold, they steal away hydrogen molecules from the pathogens. Without hydrogen, the pathogens are left without any source of energy to carry on and they die. Unlike air purification technology which relies on ultraviolet light, the ions produced by GPS' technology can travel long distances within the air stream, cleaning the air far from the physical location of the plasma generator .



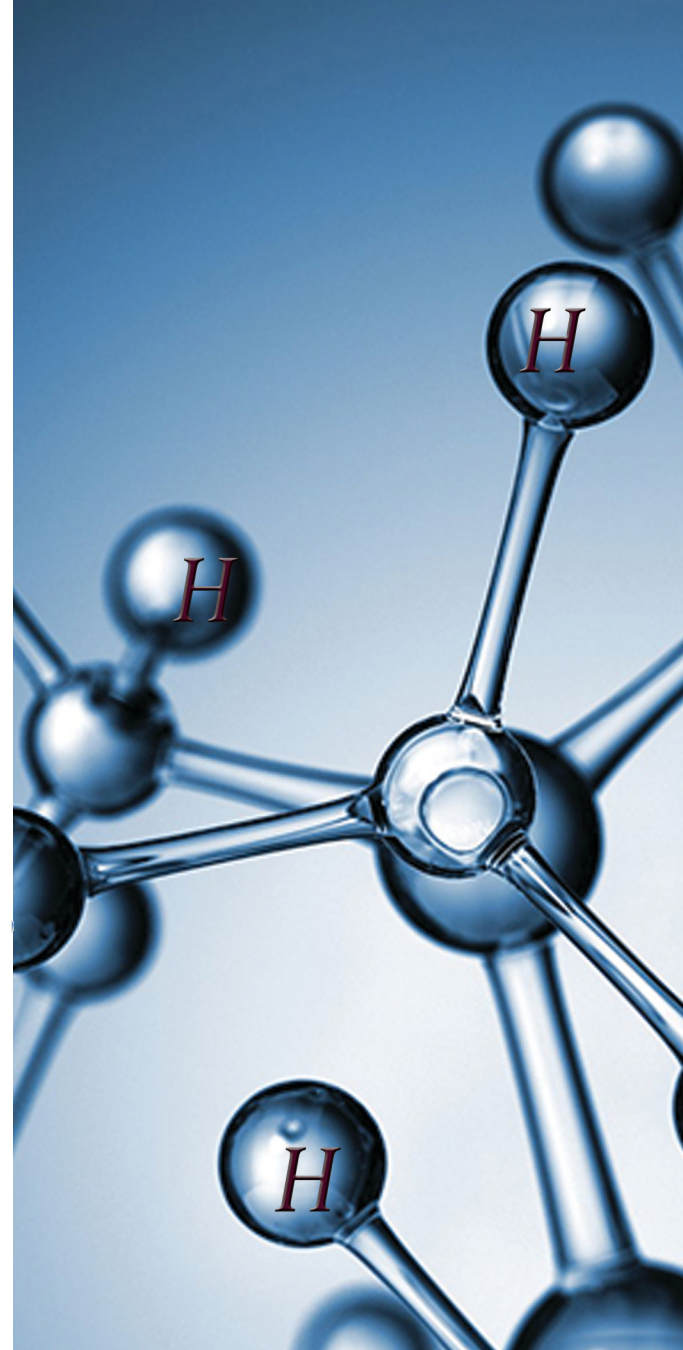
GPS Ions-safely cleaning the air you breathe

What is an ion you may ask? An ion is a molecule that is positively or negatively charged, meaning that it has electrons to give or needs electrons to become uncharged, thus becoming stable.

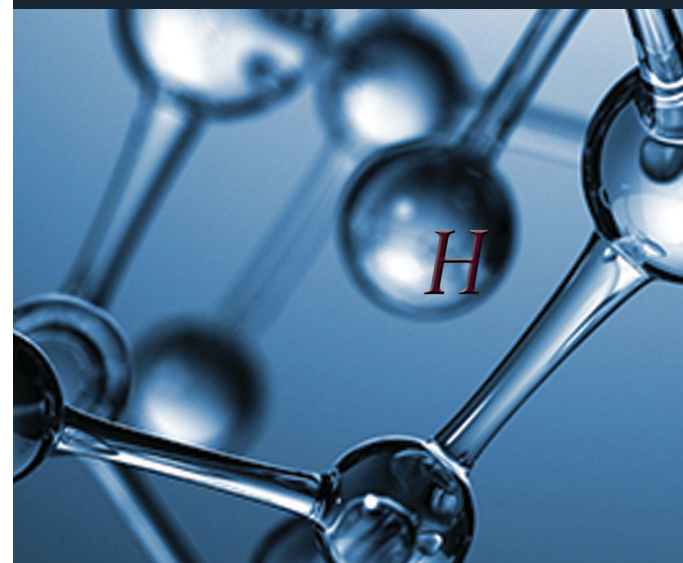
GPS' technology generates the same ions as Mother Nature creates with lightning, waterfalls, ocean waves, and the like. It's Mother Nature's way of cleansing the air naturally and creating a healthy environment. Mother Nature uses energy to break apart molecules. The only difference between GPS' technology and Mother Nature is that GPS' technology does it without developing detectable ozone. 3rd party testing by UL and Intertek/ETL to the UL 867 ozone chamber test confirmed ozone levels less than 0.00PPM!

Caution not all technologies are created equal

Photocatalytic Oxidation (PCO) technologies chemically manufacture ions using UV radiation shined onto either Titanium Dioxide (TiO₂) or a combination of TiO₂ and other metals to create a catalytic reaction. The Centers for Disease Control (CDC) provided Current Intelligence Bulletin 63 to inform the general public as well as requesting any manufacturers using TiO₂ to inform their employees and clients of the cancerous risks involved with TiO₂. PCO technology generates high levels of ozone as well!



GPS' technology has been 3rd party tested, produces ions that are already in our environment, and creates NO ROS or undesired byproducts like the PCO technologies





GPS

GPS is truly the market leader
in its industry, "Always
Innovating, Never Imitating".

100,000 Installations and Growing

Global Plasma Solutions (GPS)

is the pioneer in needlepoint bipolar ionization cold plasma technology. With TWELVE patents granted, and numerous other patents pending, GPS is the uncontested market innovator creating disruptive technology in numerous markets. Outside of the residential, commercial and industrial HVAC markets, GPS has developed products for commercial and private aviation, commercial high speed hand dryers and automobiles, just to name a few.

GPS is 50% veteran owned and over 66% of the manufacturing employees are US veterans! Nearly all of GPS' products are 100% USA raw material sourced and manufactured in our 10,000 square foot facility located in Savannah, GA

GPS Installations= 100,000+ and growing

GPS technologies are all about "Engineering the air for a better world": reducing Energy, improving the Environment and addressing the three primary contributors to poor Indoor Air-quality (IAQ): Particulates, Odor & Pathogens.

E²-POP

Energy: Commercial buildings are the single largest consumers of energy. The GPS cleaning process allows commercial buildings to safely reduce the amount of outdoor air required to operate. This equates to a safe, comfortable environment while consuming as much as 20%-30% less energy.

Environment: As the largest consumers of energy, commercial buildings represent a major contributor to green house gas emissions and global warming. The GPS cleaning system reduced the amount of energy necessary to treat and clean air, which in turn reduces the need for energy production thus lessening pollutants from sources of electric and thermal generation.

Particulates: During the GPS cleaning process, airborne particulates (dust, pet dander, pollen) are treated and then drawn together increasing their size and mass. Larger particulates are more easily captured effectively increasing the efficiency of an HVAC system's air filtration system.

Odor & Volatile Organic Compounds (VOCs): During the GPS cleaning process, cooking odors, pet odors and chemical odors, (like formaldehyde) are broken down into basic compounds free of any smell.

Pathogens: During the GPS cleaning process the ions created by the plasma generator attack and kill virus, mold spores and bacteria. The ions steal away hydrogen from the pathogens leaving them to die

Applications

Save Energy By Reducing Outside Air

Utilizing the ASHRAE 62 Indoor Air Quality Procedure, combined with GPS' air purification technology, outside air may be reduced by up to 75% in non-health care applications, subject to building pressure. The IAQP allows air purification to be applied to clean the air within the building from the contaminants of concern, thus allowing the outside air to be reduced, since the outside air is no longer required to dilute the contaminants of concern.

Save Energy By Cleaning Air Coils

Cooling coils become clogged over time and biofilm grows on the coils. This growth creates an insulating layer between the fin surface area and the air stream which causes the chiller /compressors to work harder by providing more chilled water or higher refrigerant pressures. The biofilm reduces thermal transfer. The added biofilm and debris will reduce the "free" passageways for the air to flow and require the fan to work harder. The GPS-IBAR solution will kill the biofilm on the coil surface, the drain and drain pan. When the cooling coil starts to condense moisture, the biofilm will run off with the condensate and down the drain.

The GPS Ion Bar advantages over UV lights:

- No replacement parts and no glass tubes with mercury in the air stream
- No visible light; therefore, no safety precautions such as door switches are required
- Less energy required – only 15 watts of power up to 60,000 CFM using the GPS-iMOD
- GPS' technology cleans the entire depth of the cooling coil
- GPS' technology kills pathogens downstream from the system and it's not line-of-sight like UVC
- GPS' technology controls odors, UV does not
- GPS' technology mounts direct to the cooling coil frame – UV lights require a separate framing system requiring more install labor

GPS' Engineering Software

Over 1,000 projects have been designed using GPS' IAQ spreadsheet based on ASHRAE 62. In some cases outside air quantities were reduced to as little as 2.5 CFM per person! GPS software is available to engineers who request
Online @gps HVAC.com.



Utilizing the ASHRAE 62 Indoor Air Quality Procedure, and GPS' technology, the Tampa Bay Arena avoided over 700 tons in chiller capacity, reduced first costs by over \$1 million and saves over \$115,000 per year in energy.

New Commercial Solutions

GPS is "Always Innovating, Never Imitating" and our new products prove it. GPS has many "Firsts" in the HVAC industry:

- First Needlepoint Ion Bar
- First Flexible Needlepoint Ion Bar
- First Modular Needlepoint Ion Bar
- First Self-Cleaning, No Maintenance Needlepoint Ion System
- First Universal Voltage Input System 24VAC to 240VAC



GPS-iMOD

The patent-pending GPS-iMOD is a modular ionization system that allows any size ionization bar to be field erected up to any length required. The all composite and carbon fiber construction allows the product to be mounted in any environment regardless of corrosive chemicals in the air. Universal voltage selector switch, illuminated On/Off switch, plasma on indication light, six HV output ports, alarm contacts, magnets for ease of installation, and auxiliary terminals for connection of an optional GPS-iDetect-P ion sensor are all included as standard. The GPS-iMOD has passed the UL 867 ozone chamber test and has been certified by UL 2998 as an ozone free device.

GPS-DM48-AC

The patent-pending, GPS-DM48-AC is the world's first self-cleaning, no maintenance air purification system designed to provide whole building air purification in forced air systems applications up to 4,800 CFM or 12 tons. Universal voltage, digital display, alarm contacts and a weather proof housing are included as standard.



GPS-iRIB-36

The patent-pending GPS-iRIB-36 is made from a flexible chemical, heat and cold resistant Kapton material containing a circuit with special carbon fiber ion needles "molded" into the circuit traces. What use to be a mechanism to transport voltage and signals between solid objects has now been engineered to deliver the highest level of ionization with the least amount of energy in the most compact size. The unit includes 110/220VAC input and optional alarm contacts.



GPS-FC48-AC

The patent-pending GPS-FC48-AC is a self-cleaning, needlepoint carbon fiber brush, bi-polar ionization generator with a capacity rating from 0 to 4,800 CFM or 12 tons. The unit is compact for mounting to the fan inlet on most HVAC systems. The unit comes standard with universal voltage input with a range from 24VAC to 240VAC, BAS alarm contacts rated 250VAC/1A, local LED for operational status and a field programmable cleaning cycle, preset to clean every three days.



Commercial Solutions



GPS-FC

The GPS-FC is a carbon fiber brush, needlepoint, bi-polar ionization generator rated 1,200 CFM or up to 3 tons nominal capacity. The GPS-FC is great for mounting in fan coils, ductless mini-splits, chilled beams, water source heat pumps or any other forced air systems with low air flow. The GPS-FC-1 is rated 120VAC and the GPS-FC-2 is rated 208-240VAC.



GPS-FC-3-BAS

The patented GPS-FC-3-BAS is a carbon fiber brush, needlepoint, bi-polar ionization generator rated 3,200 CFM or up to 8 tons nominal capacity. The GPS-FC-3-BAS is great for mounting in fan coils, RTU's, water source heat pumps or any other forced air systems. The GPS-FC-3-BAS includes an alarm contact for interfacing to a BMS. It also includes an integral LED for local operational status. The GPS-FC-3-BAS operates from 24VAC.



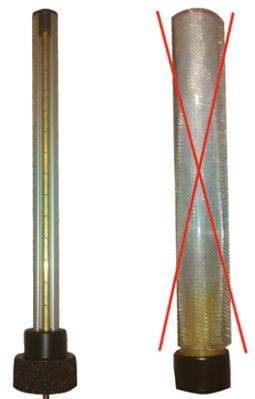
GPS-iBAR

The patented GPS-iBAR is a bipolar ionization generator custom manufactured for any air flow and is constructed from extruded aluminum and contains 316 stainless steel ion needles every 3/4" down the length of the bar. The bar comes in sizes from 8" up to 143" in 3" increments. The GPS-iBAR may be mounted in AHUs or RTUs. The GPS-iBAR is perfectly suited to mount to cooling coils on the air inlet side to clean up old coils and keep new coils clean.



GPS-RetroFusion Tube

The patented GPS-RetroFusion Tube was designed to replace any glass ion tubes. Simply by swapping out glass ion tubes with the GPS-RetroFusion Tubes, the ion density will increase, the power consumed will go down, the ozone produced from the glass will be eliminated and you will never have to replace the tubes again!



GPS-KOG-50

The GPS-KOG-50 is a commercial grade ozone generator designed for use in applications where grease and odor control are required. Applications to consider using the GPS-KOG-50 include: kitchen hood exhaust, waste water treatment plants, pet food manufacturing exhaust, or any other application where offensive odors are rejected outdoors. Please note, the GPS-KOG-50 output should never be injected into an occupied space. The unit is rated for up to 5,000 CFM exhaust flow and is powered by 120VAC. The 5,000 CFM rating is nominal and may vary based on odors in a specific application.



GPS-300

The GPS-300 is designed to fit into a 24" x 24" ceiling cassette grid. It is well suited for spot treating trouble areas to provide odor, pathogen and particle control. It has been used in hospital waiting areas, smoking rooms, nurses stations and cigar bars. The unit comes standard with these options: water washable prefilter, carbon filter, HEPA filter, needlepoint bi-polar ionization, four way modulating supply grilles, & wireless remote control.



DIESEL OXIDATION CATALYST

The GPS-DOC is designed to mount directly on the exhaust manifold of diesel generators. GPS' DOC contains an integral molecular sieve coating (odor traps) that adsorb diesel exhaust gas odors from a cold start. Standard catalysts rely on engine heat to reduce the emissions, so while the engine is warming up, odors go to atmosphere untreated and can possibly be pulled back into a building causing odor complaints. Once the exhaust temperature reaches 400F or higher, the molecular sieve coatings release the trapped odors and then the second stage being sufficiently hot will oxidize the odors like a normal catalyst. When the odors are released from the molecular sieve coating, the catalyst will be ready for the next cold start. Exhaust gas flow, exhaust pipe diameter, engine size and generator KW are required to size the catalyst properly.



GPS-IMEASURE

The patent-pending GPS-iMEASURE takes the GPS-iDETECT-P to the next level. This sensor is designed to be wall or duct mounted and measures ion levels in real time through sampling the air. It provides a 2-10VDC signal to the BMS corresponding to a field selectable ion range. The unit requires 12-24VDC to operate.



GPS-TVOC

The GPS-TVOC sensors are designed to measure TVOCs (odors) from 0-5,000 PPM to prove what the ions are actually doing to the air quality. These sensors can be duct mounted or space mounted. In some installations, a duct mounted sensor mounted upstream and downstream from the GPS-iBAR or GPS-iMOD proves the one pass effectiveness of the ionization system.



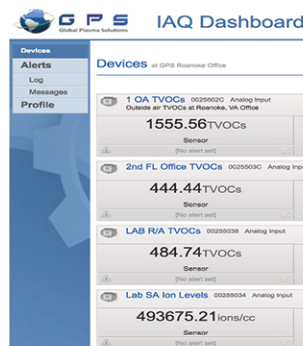
GPS-iDETECT-P

The GPS-iDetect-P was designed for use with the GPS-iBAR or GPS-iMOD. It mounts directly to the bars and provides an on/off status that the output of the bar is above the sensor setpoint. The sensor operates from 24VAC to 240VAC and has a field selectable ion sensing range.



GPS DASHBOARD - ONLINE MONITORING

GPS now offers online monitoring to confirm the indoor air quality in any application. The system utilizes WIFI sensors connected to a GPS router that sends the data to GPS' web server. Users are assigned unique login credentials and can login from anywhere there is an internet connection. Sensors available include: TVOC, CO2, Temperature, Humidity, PM 2.5, PM 10, Ion Status and Ion Levels. Alerts can be set to send alarm emails when parameters are out of range. The system also provides trend reports to see how the system is working over time and compare the air quality results from month to month, day to day or hour by hour.





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GPS

3rd Party Testing Summary

Pathogen	Time in Chamber	Kill Rate	Test Agency
T.B.	60 minutes	69.09%	EMSL
C. difficile	30 minutes	86.87%	EMSL
Noro Virus	30 minutes	93.50%	ATS Labs
MRSA	30 minutes	96.24%	EMSL
Staph	30 minutes	96.24%	EMSL
Mold Spores	24 hours	99.50%	GCA
E. coli	15 minutes	99.68%	EMSL
Legionella	30 minutes	99.71%	EMSL



GPS' technology is the only active air purification system that has been designed and approved to operate in commercial and private aircraft. Aviation applications require passing the stringent DO-160 test proving the technology does not generate EMF, line noise or interfere with the avionics in any way. This is important to note, since GPS' technology is used in many healthcare applications and interference with healthcare imaging equipment would be detrimental to patients.

GPS Charities

GPS believes in giving back to the community. The two charities that GPS is currently involved are the Wounded Warrior Project and the ASPCA.



Industry Associations



Underwriters Laboratories



According to the American College of Allergy, Asthma and Immunology nearly 50 million Americans suffer from seasonal allergies associated with pollen and mold.

Airborne mold spores- Reduced 99.5%

