



Established in 1995, Sanuvox Technologies' mission was to design a line of residential and commercial Ultraviolet Air Purification Systems that would address Indoor Air Quality (IAQ) and Sick Buildings. Innovation and the understanding of ultraviolet technologies has produced a line of residential and commercial products that are unsurpassed in the industry.

Sanuvox Ultraviolet Air Purifiers will neutralize biological & chemical contaminants such as mold, bacteria, viruses, spores, allergens, cigarette smoke, cooking & pet odors, garbage & sewer odors, VOCs, diesel fumes and thousands of other airborne contaminants.

Sanuvox Technologies has spent years developing the Ultraviolet Technology which would make it possible to effectively and efficiently treat moving air with UV Energy. Within these pages you will learn about Sanuvox and how experience and understanding has led to a line of multi-patented residential, commercial and industrial purifiers that cannot be matched in quality, performance, variety and cost efficiency.

## SANUVOX AT A GLANCE

Multi U.S. & Canadian Patented Ultraviolet Systems

Global Leader in Ultraviolet Air & Object Purification

Tested by:

McGill University

Penn State University

Tested & Published Results in:

The Lancet Medical Journal Infection Control & Hospital Epidemiology  
(The University of Chicago Press)

The United States Environmental Protection Agency (EPA)  
& The National Homeland Security Research Center (NHSRC) against  
Biological Warfare Agents and bacterial and viral contaminants





## TABLE OF CONTENTS

|  |    |
|--|----|
| Introduction   | 2  |
| Table of Contents  | 3  |
| Why Sanuvox  | 4  |
| The Importance of Parallel Installations                             | 5  |
| The Importance of Sanuvox Ultraviolet Lamp Technology                | 6  |
| The Importance of Reflection   | 7  |
| In-Duct Ultraviolet Air Purifiers                                    | 8  |
| Residential In-Duct Systems  | 8  |
| Residential / Light Commercial In-Duct System                        | 9  |
| Commercial In-Duct System  | 10 |
| Stand Alone or Ducted Models   | 12 |
| Portable Ultraviolet Air Purifier                                    | 12 |
| 24 x 24 Ceiling Tile Mount Air Purifier                              | 13 |
| Combination HEPA Filter / UV Air Purifier (200 cfm / 300 cfm)        | 14 |
| Combination Filter / UV Air Purifier (1000 cfm)                      | 15 |
| Mobile Air & Surface Sterilizer                                      | 16 |
| Ultraviolet Object Purifiers for Mold & Bacteria on Evaporator Coils | 17 |
| Residential Object Cleaners  | 17 |
| Commercial Object Cleaners   | 18 |
| Specialty UV Products  | 21 |
| EPA & The National Homeland Security Research Center Testing         | 22 |
| Questions & Answers  | 23 |
| Common Biological & Chemical Contaminants                            | 25 |
| Ultraviolet Rating Values (URV)                                      | 25 |
| Technical Specifications   | 26 |

## WHY SANUVOX?

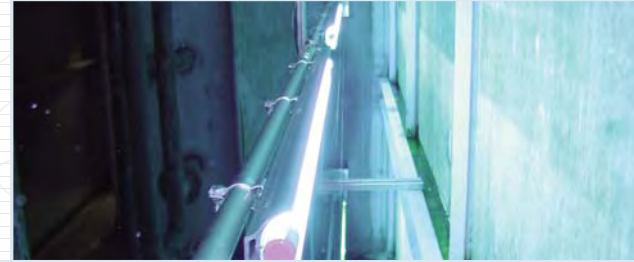
### The Battle for Air Supremacy (Air Purification)

Multi U.S. & Canadian patented ultraviolet systems designed to neutralize up to 99.999% of biological & chemical contaminants that travel throughout the home, building and facility.



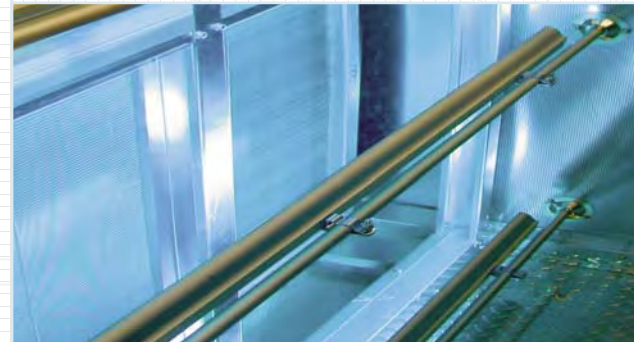
### For Coils or Stationary Objects (Mold on Coils)

A complete line of patent pending Ultraviolet Object Purifiers designed specifically for mold on A/C coils. High-Intensity UVC Lamps mounted to Anodized Aluminium Parabolic Reflectors direct virtually all the UV Energy onto the coil without losing UV intensity from the top, bottom and behind the Lamp.



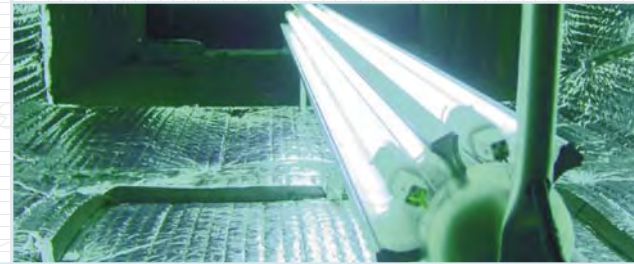
### ASHRAE Handbook o8

The ASHRAE Systems Handbook (2008) now incorporates a chapter devoted to engineered ultraviolet systems. Included in chapter 16 of the publication is advice pertaining to the selection, installation and operation of ultraviolet lamps. Further details regarding effectiveness of ultraviolet germicidal irradiation is given in the ASHRAE position document on Airborne Infectious Diseases, dated 2009. References also can be found on [www.sanovox.com/research](http://www.sanovox.com/research) including the study published in the Lancet Medical Journal sponsored by the Medical Research Council.



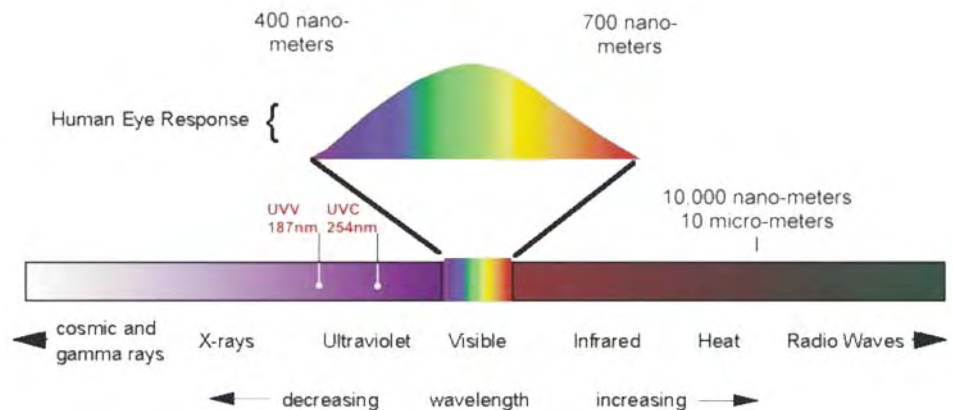
### Third-Party Testing (Tested & Proven)

Sanuvox Ultraviolet Systems have been tested to meet strict "Kill Rates". Third-Party testing includes McGill University, The Montreal Chest Institute, The United States Environmental Protection Agency (EPA) & The National Homeland Security Research Centre (NHSRC) as well as independent laboratories.



### The Sun & Our Atmosphere

The Sun purifies the Earth's atmosphere by bombarding it with Ultraviolet Light. Ultraviolet-C (254 nanometers) & Ultraviolet-V (187 nanometers) light destroys the biological & chemical contaminants within our atmosphere. Sanuvox High-Intensity UV Lamps produce the same UV-C & UV-V Light the Sun produces bringing the same purification process into the building.





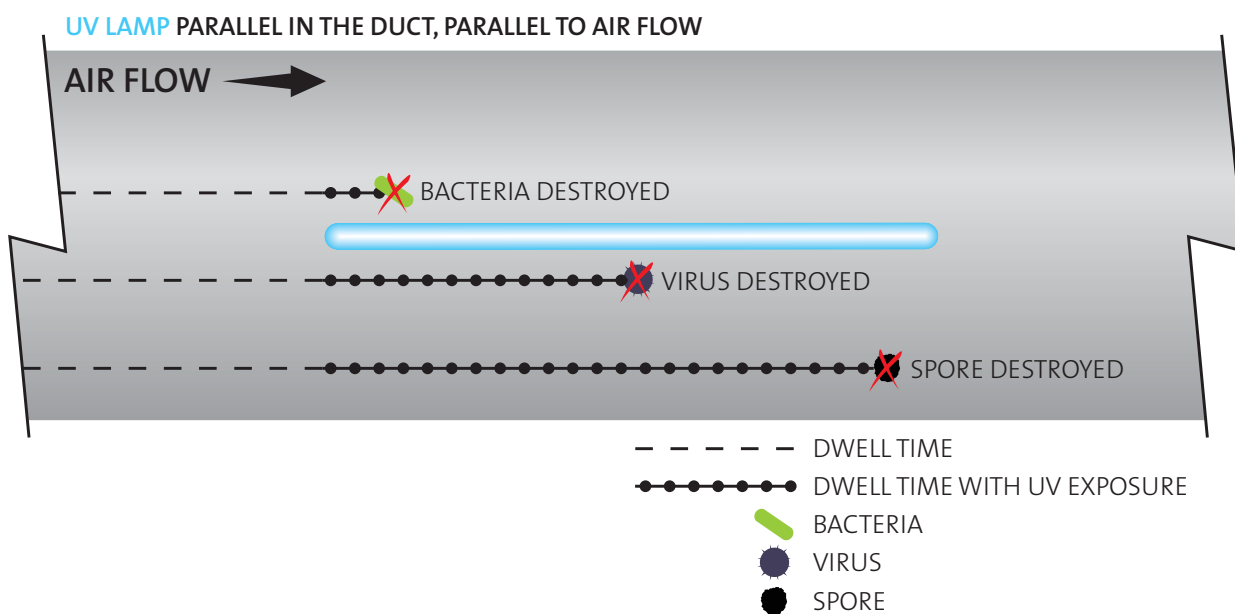
## The Importance of Parallel Installation

In order for Ultraviolet Light to be effective in destroying biological contaminants in the moving air-stream, there has to be a specific amount of UV power delivered to the contaminant for a specific amount of time.

Contaminants require varying dosages of UV energy ( $\mu\text{w}$ ) to destroy. Typically, bacteria are the weakest contaminants, requiring the least amount of energy. As a general rule, a virus is usually more resilient to UV energy, requiring more than twice the amount of UV energy than bacteria. A spore is typically the hardest to destroy, requiring more than 5X the amount of UV energy compared to a virus.

Research on Sanuvox systems show that PARALLEL installations of the Lamp(s) in the air-stream will result in greater contact time (dwell time), allowing for more UV energy to be delivered to the bacteria, virus or spore, resulting in a high “Kill Rate”. But more importantly from a practical standpoint, the parallel installation eliminates Lamp surface fouling due to direct air impingement. The parallel Lamp orientation provides the best overall performances and efficiency.

## PARALLEL INSTALLATION



Sanuvox proprietary Mercury Vapor Ultraviolet Lamps produce two UV wavelengths. UVC (Germicidal 254nm) and UVV (Oxidizing 187nm) pure fused quartz glass that are combined into one single UV Lamp emitter.

UVC energy attacks the DNA of a cell, penetrating the cell membrane, breaking the DNA structure of the microorganism, inhibiting reproduction. UVC is effective in destroying biological contaminants and odors such as mold, bacteria and viruses. The Centers for Disease Control (CDC) recommends this method for destroying viruses such as tuberculosis.

UVV (Vacuum UV) is used for Oxidization; this is the portion of the Lamp that will destroy chemicals and odors, such as cigarette smoke, VOCs, diesel fumes, formaldehyde, amongst others.

Both UV wavelengths work together to destroy thousands of biological and chemical contaminants that continually circulate within the building’s envelope.



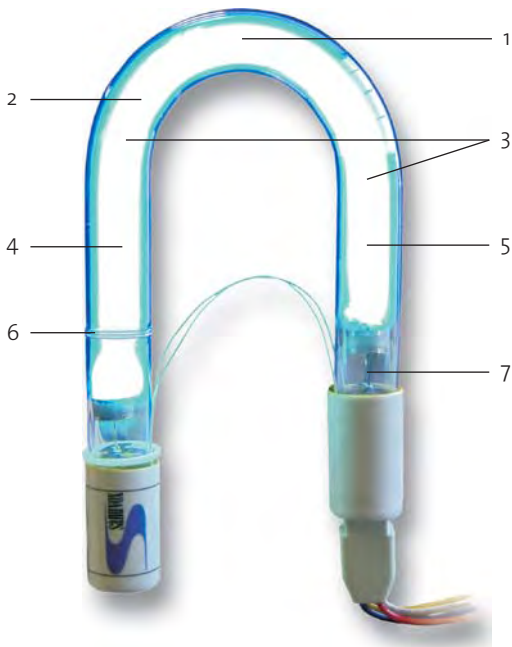
**STRAIGHT LAMP**



Sanuvox Ultraviolet Lamps are available in a wide range of proprietary designs and UV wavelengths. Sanuvox Lamps are available as both 19mm “Single Zone” UVC (254nm) Germicidal wavelength that will destroy biological contaminants & 19mm “Dual Zone” Lamps incorporating UVC (254nm) Germicidal & UVV (187nm) Oxidizing wavelengths designed to destroy biological & chemical contaminants. Single zone UVV Oxidizing Lamps are also available for specific applications.

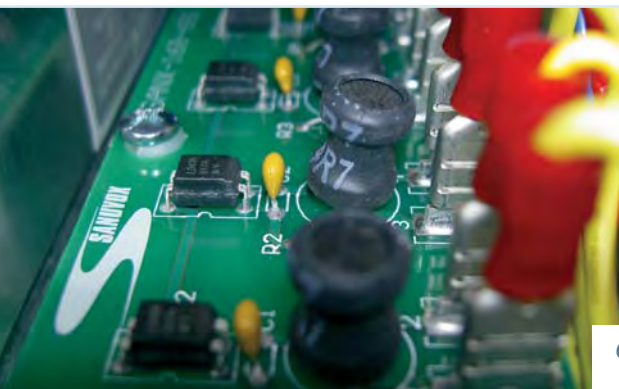
Each Sanuvox Lamp is manufactured to meet strict quality control and efficiency guidelines and are tested before they leave the factory. Sanuvox Ultraviolet Lamps are unquestionably the highest quality UV Lamps available. Sanuvox incorporates the very latest in UV Lamp technologies, guaranteeing longest Lamp life, low mercury content, with features such as anti-solarization coatings, proprietary gas mixtures, pure fused quartz glass, and heavy duty filaments that provide extra long life. For shatter proof applications such as food processing, packaging, pharmaceuticals, etc. Lamps may be special ordered with a shatter proof teflon sleeve.

**“J” LAMP**



- 1 - High-Intensity 19 millimeter Dual Zone UVC Germicidal 254nm & UVV Oxidizing 187nm Lamp
- 2 - Internal Alumina Coating (IAC): Prevents Solarization of the Lamp & increases stability and efficiency
- 3 - Proprietary “J” Shape Lamp effectively takes the place of two Lamps
- 4 - Proprietary Mercury Vapor Gas Mixture (MVG) produces the most stable, cleanest burning Lamp
- 5 - Hot Cathode Pure Fused Quartz Glass Guarantees the highest quality, cleanest mineral glass and highest UV efficiency
- 6 - Proprietary Splice: This is where the UVV Glass is fused to the UVC Glass. The UVC Glass makes up at least 90% of the Glass surface. UVV makes up the remainder (10% or less)
- 7 - Heavy Duty Filaments provide extra long Lamp life

**POWER SUPPLY**



Sanuvox Systems incorporate the latest proprietary high performance electronic power supplies. Features include dual voltage, line surge protection, current compensation, higher efficiency and agency approvals.



## THE IMPORTANCE OF REFLECTION

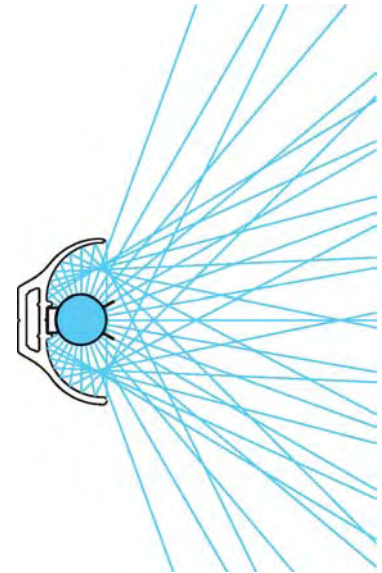
All patented Sanuvox Ultraviolet Air Purifiers and CoilCleaners use Aluminum Reflectors to direct the UV Energy where needed most. Select Sanuvox systems use an Aluminum Reflecting Tube which contains the UV Energy making for a concentrated dose of UV, while Sanuvox UV CoilCleaners use Parabolic Aluminum Reflectors to direct the UV Energy.

The use of Aluminum Reflectors is an integral part of Sanuvox proprietary systems. By using Reflectors, Sanuvox is able to maximize virtually all the UV energy, either by concentrating the UV energy, or by directing the UV energy.

A flashlight or a car's headlight uses a Reflector to direct the Light where needed most. UV energy is no different; a Reflector is needed to maximize UV efficiency and intensity.

Aluminum has one of the highest co-efficiencies of reflectance at >85%.

### REFLECTING PATTERN



### BENEFITS OF REFLECTION

- Direct virtually all the Lamp's UV energy where needed most
- Drastically increases effective Lamp life
- Allows for the Lamp to be self-cleaning by directing UV back in on itself, burning off bio-aerosols that adhere to the Lamp glass surface
- Protects plastics, rubber and occupants from UV exposure
- Supports Lamps that can be as long as 60", protecting them from breakage
- Maintains Lamp temperature at a more constant level

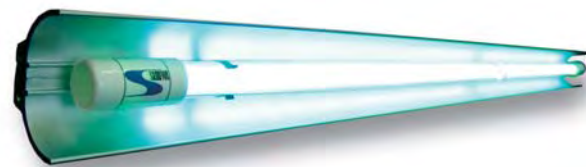
A UV Bio-Wall uses five Anodized Aluminum Parabolic Reflectors to project the UV energy outwards from the center of the duct. (example 1)

A CoilClean IL Object Cleaner uses the Reflector to direct the UV energy onto the evaporator coil and drainpan, destroying and preventing mold and other microbial growth. The Reflector protects the Lamp from contaminants striking and adhering to the glass and maintains the Lamp at a stable temperature. (example 2)

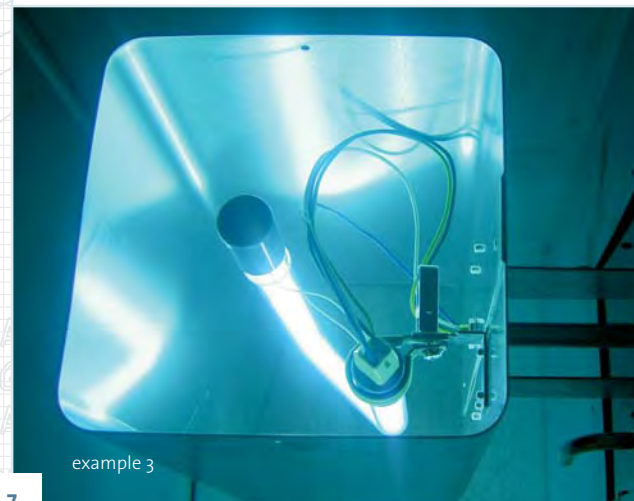
The Sanuvox In-Duct UV Air Purifiers use an Aluminum Reflecting Tube which houses the UV Lamp, making for a concentrated self cleaning dosage of UV energy. (example 3)



example 1



example 2



example 3



## R1700GX / R4000GX In-Duct

Designed to be installed in the return or supply plenum. As the airflow passes through the R1700GX or the R4000GX's Aluminum Reflector Tube, the proprietary Sanuvox process destroys the contaminants that would otherwise be distributed throughout the ventilation system.

These High-Efficiency Air Purifiers use a proprietary split UVC/UVV (Germicidal 254nm / Oxidizing 187nm) Lamp to destroy biological & chemical contaminants including odors. The 3 year warranty includes the UV Lamp & all replacement Lamps. Purifying area is up to 1700 square feet for the R1700GX from 1500 to 4000 square feet for the R4000GX.

Contaminated air enters the Sanuvox UV Air Purifier parallel to the UV Lamp, increasing contact time with the UV energy.

The Turbulator slows, spins and mixes the air around the "J" Lamp.

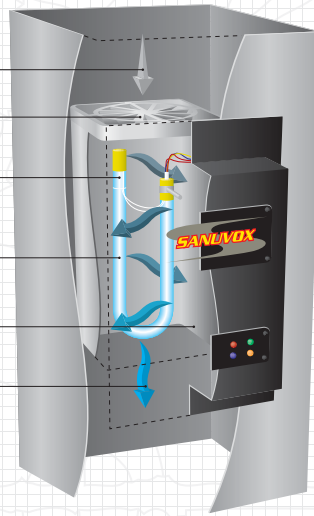
The UV-V section of the Lamp first destroys chemicals and odors.

The UV-C germicidal section then destroys biological contaminants.

The Aluminum Reflector Tube intensifies the UV energy for optimal purification.

The treated air then circulates through the home ventilation system.

After approximately 2 hours of operation, the Sanuvox purifier will have destroyed in excess of 80% (average) of the contaminants in the home.



Ventilation Duct

## R1700GX IN-DUCT



Up to 1700 sq. ft Home

## R4000GX IN-DUCT



From 1500 sq. ft to 4000 sq. ft Home

\*Commercial 2000 cfm model also available

## FEATURES

- Eradicates bacteria, viruses and mold
- Destroys chemical and biological odors
- High Efficiency patented design
- High Intensity UVC/UVV Quartz Lamp
- Average UV intensity inside Aluminium Reflector Tube: R1700GX = 10,212 microwatts per/cm<sup>2</sup>  
R4000GX = 16,479 microwatts per/cm<sup>2</sup>
- Most effective UV Air Purification System available
- LED "Smart Lamp System" Visual Status Display
- In-Duct installation for whole home purification
- 3 year warranty on parts including UV Lamp
- CSA C/US Certified & CE Approved

## ACCESSORIES

- Remote Wiring Kit: Allowing the control box to be detached from the reflecting tube. Part# REMKIT
- 1" Fiberglass Ductboard Mounting Kit for R1700GX. Part# FIBER1700-1. For R4000GX. Part# FIBER4000-1
- 1.5" Fiberglass Ductboard Mounting Kit for R1700GX. Part# FIBER1700-1.5. For R4000GX. Part# FIBER4000-1.5

## HVAC SYSTEM



Return or Supply Plenum Installation





## UV BIO-WALL QUATTRO



## UV Bio-Wall QUATTRO In-Duct

Inspired by the overwhelming success of the Commercial UV Bio-Wall, the QUATTRO is designed as a Light Commercial / Residential In-Duct UV Air Purifier.

The QUATTRO will treat the entire duct at one time, destroying up to 99.99% of the biological and chemical contaminants in the air-stream.\*

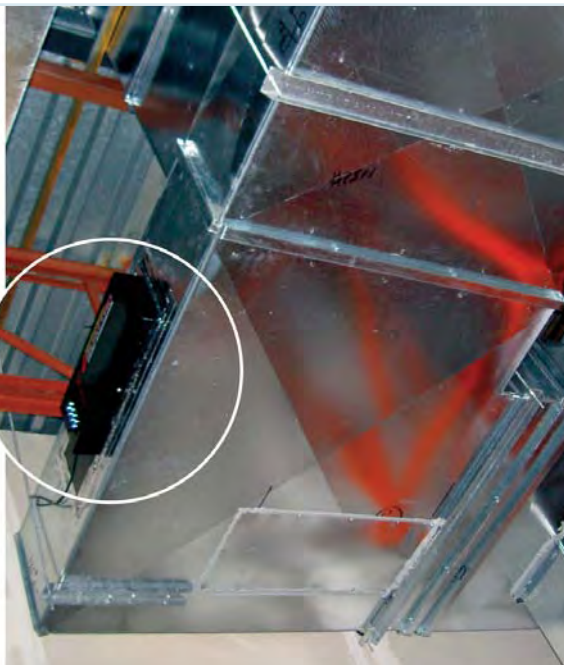
The Quattro includes three (3) 18" High-Intensity Pure Fused Quartz UVC Germicidal Lamps and one (1) 18" High-Intensity Pure Fused Quartz UVC / UVV Lamp, which are attached to four (4) Anodized Aluminum Parabolic Reflectors and are mounted parallel to the air-stream.

Adjustable clutch mechanism allows the Lamps and Reflectors to be extended up to 15" from the duct wall so the assembly can be positioned in the center of the duct-work, creating a wall of Germicidal UV energy up to 24" deep.

There are no air purifiers on the market that can match the power, intensity and dwell time that the UV Bio-Wall series can deliver.

\* Percentage of biological destruction will depend on: size of duct; velocity of the air where the QUATTRO is installed; contaminants to be destroyed; percentage of outside make-up air.

## IN-DUCT INSTALLATION



## FEATURES

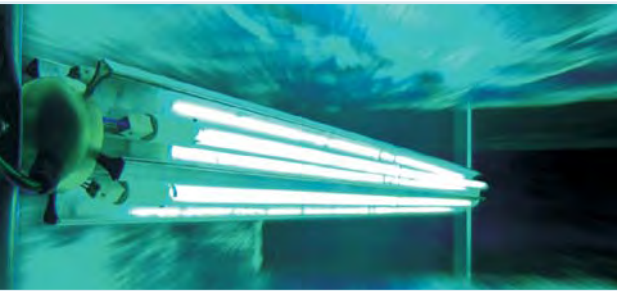
- Commercial / Residential In-Duct UV Air Purifier
- Treats the entire duct on one pass
- Destroys up to 99.99% of biological contaminants on one pass
- Destroys chemicals & biological odors
- Installed PARALLEL to the air-stream resulting in greater "Dwell Time" between the Air & the UV Lamps
- 1,600 microwatts per/cm<sup>2</sup> of UV intensity @ 36"
- Four 18" High Intensity 19mm Pure Fused Quartz Lamps
- Four Aluminum Anodized Parabolic Reflectors intensify & maximize 360° of UV Energy
- Pressure Sensor turns purifier On & Off. Simple installation, just "Plug & Play"
- LED "Smart Lamp System" Visual Status Display
- Four High-Output Electronic Rapid-Start Ballasts
- Adjustable Clutch mechanism allows for Reflectors & Lamps to easily extend up to 15" to the center of a 30" duct
- Patented Design & Sanuvox Quality
- Recommended Lamp change-out: Commercial: 2 years / Residential: 3 years
- CSA C/US Certified & CE Approved

## ACCESSORIES

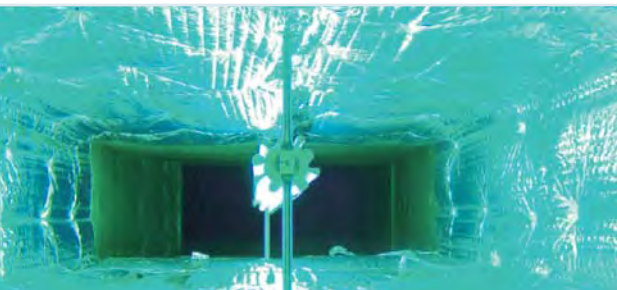
Bio-Film Aluminum Foil for increased reflectivity. 2ft x 6ft. Part# MSC7



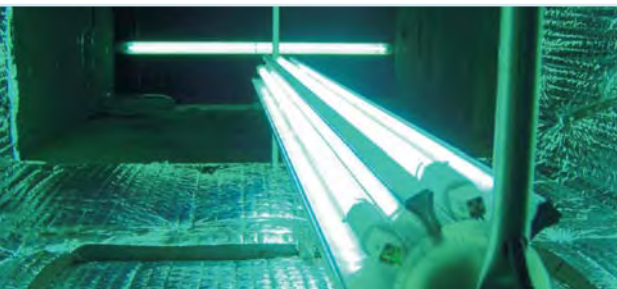
## UV BIO-WALL



Installing parallel to the air-stream increases dwell time (contact time) with air



Creates a wall of germicidal UV energy in excess of 6 feet deep destroying airborne contamination



Severe chemical and odor applications: a single Multi-split lamp working in conjunction with the UV bio-wall is installed up-stream



\* UV Bio-Wall Ballast & Control Panel

## Commercial UV Bio-Wall In-Duct

The UV Bio-Wall provides a “barrier wall” of UV Energy destroying biological and chemical contaminants passing through it.

Each Bio-Wall has 5 High Intensity 19mm Pure Fused Quartz Lamps, which are mounted to Aluminum Anodized Parabolic Reflectors that reflect the full 360° of Germicidal Radiation. The Bio-Wall is mounted parallel to the airstream in order to maximize the contaminant’s contact time with the UV Energy.

The Bio-Wall is equipped with a monitoring display built into the ballast box which includes a digital visual hour accumulator, monitoring LEDs & “Lamp Out” alarms.\*

The number and length (can be up to 60" long) of Bio-Walls will depend on the size of the duct, the velocity of the air moving within the duct, the specific contaminants to be treated and the desired % kill.

See bottom of page 27 for explanation of Building Automation Monitoring Software.



## FEATURES

- Drastically improves Indoor Air Quality
- Continuously treats the entire duct
- Destroys up to 99.99% of biological & chemical contaminants on one pass
- Available 18” to 60” Lamp lengths
- 5 High-Intensity Pure Fused 19mm Quartz UVC Lamps
- 5 Anodized Aluminum Parabolic Reflectors maximizes 360° of UV Energy
- Digital Hour Accumulator. LED & Audible Alarm on Ballast Control Panel\*
- Available with remote computer monitoring that can be tied into the buildings automation. Included software monitors Lamp life, system status and history (see bottom of page 27 for full description)
- Tested by The EPA & The National Homeland Security Research Center achieving greater than 99.97% destruction on Biological Warfare Agents on one pass
- CSA C/US Certified & CE Approved

## ACCESSORIES

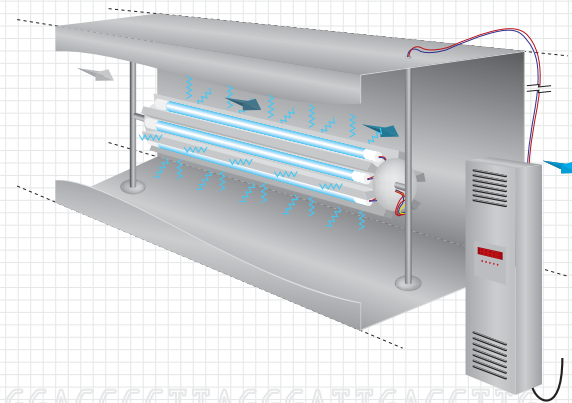
- Bio-Film Aluminum Foil for increased reflectivity. 150 ft roll x 6ft. Part# MSC6
- **For Elevated Chemical & Odor Applications.** Multi-Split Lamps w/ Reflector ranging from 12” - 60” lengths



## UV BIO-WALL

### Standard Indoor Air Quality Installation

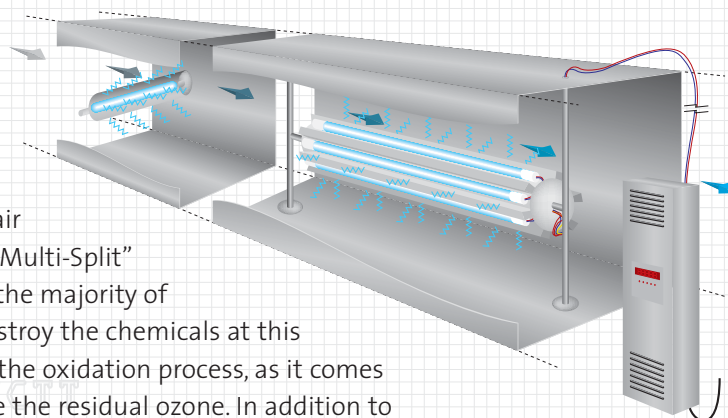
This installation uses the standard UV Bio-Wall. Designed for “all-around” chemical & odor control as well as drastic biological destruction. The UV Bio-Wall produces a UVC Germicidal wall destroying the biological contaminants passing through it. A small portion of UVV Oxidizing glass is used to destroy chemical contaminants and odors. The UV Bio-Wall can be sized for any duct size at any velocity of air, for any desired kill percentage on any biological contaminant.



### UV BIO-WALL WITH MULTI-SPLIT

#### Elevated Chemical & Odor Option

If the application requires a higher level of odor/chemical control, “Multi-Split” fixture(s) are installed upstream of the UV Bio-Wall(s). This perpendicular mounted UV Lamp produces elevated oxidation levels, and insures that all of the air moving in the duct will be treated. The distance between the “Multi-Split” Lamp and the UV Bio-Wall acts as a Reaction Chamber where the majority of chemicals and odors will be destroyed. Oxidation is used to destroy the chemicals at this point in the process. If there is residual ozone remaining after the oxidation process, as it comes in contact with the UV Bio-Wall, the Bio-Wall will then catalyze the residual ozone. In addition to catalyzing the residual ozone, the UV Bio-Wall will also destroy the biological contaminants in the air.



## TESTING

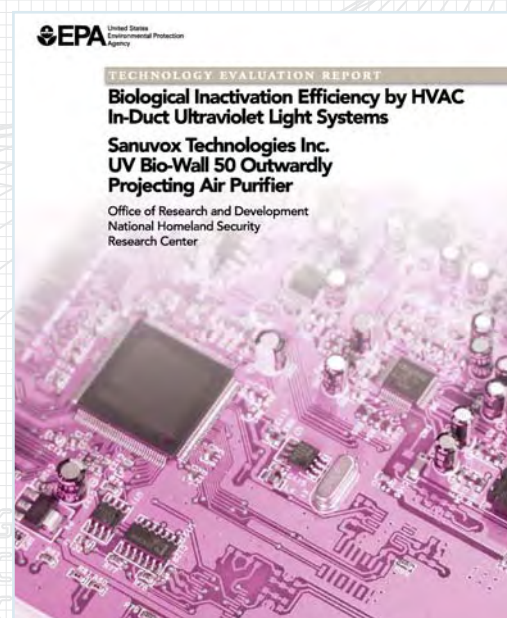
Tested by The Environmental Protection Agency (EPA) & The National Homeland Security Research Center (NHSRC) on Biological Warfare Agents (BWAs).

A SINGLE UV Bio-Wall 50” (available up to 60” Lamp lengths) showed greater than 99.97% destruction on one pass on airborne bacteria, 99% on viral & 93% on spore.

Testing under task order 1112 of the contract between EPA and Battelle Memorial Institute for implementation of the Technology Testing and Evaluation Program (TTEP was established by the National Homeland Security Research Center with the U.S. Environmental Protection Agency’s Office of Research & Development).

<http://www.epa.gov/NHSRC/pubs/erUVSanuvoxo62606.pdf>

See page 22 to read the EPA Executive Summary testing.





### P900GX Portable UV Air Purifier

The P900GX has all the benefits of Sanuvox's patented system in a portable air purifier weighing only 11 lbs. The P900GX's variable speed blower pulls the air into the reflective Aluminum Reaction Chamber parallel to the UV Lamp where the Dual Zone UVC/UVV (Germicidal /Oxidizing) Lamp destroys the biological and chemical contaminants'.

The P900GX can be used continuously or when the need arises. Easily transported and includes a stand and carrying handle. The P900GX will purify up to 900 square feet and is ideal for anyone in need of a cost effective solution for those who work in offices, or, for those who do not have a forced air home system.

### P900GX



### P900GX CONTROL PANEL



### FEATURES

- Eradicates bacteria, viruses and mold
- Destroys chemical and biological odors
- Sanuvox's patented system in a Portable UV Air Purifier weighing 11 lbs.
- High Intensity 19mm UVC/UVV Quartz Lamp
- 8,540 microwatts per/cm<sup>2</sup> of average UV intensity inside UV Reaction Chamber
- 9 electronically controlled speeds
- Touch-Pad Digital Controls with Count-Down Timer
- Most effective Air Purification System for those who do not have a forced air system
- Purify up to 900 square feet
- Easily wall mountable. Integral stand and handle included
- 3 year warranty on parts including UV Lamp
- CSA C/US Certified & CE Approved

### IDEAL FOR

- Homes, apartments, waiting rooms, break rooms, classrooms, offices, boats & RV's, hotel rooms, fire restoration and any application that would require spot biological & chemical purification

### ACCESSORIES

- All UVV Oxidizing Lamp (187nm) used in unoccupied spaces for concentrated chemical & odor applications. Applications include: fire restoration, car dealerships and detailing shops, real estate, garbage rooms, etc.



### TESTING

In a test conducted by McGill University and the Montreal Chest Institute research team on the efficacy of Ultraviolet Air Purification and published in Infection Control & Hospital Epidemiology (The University of Chicago Press), a portable ultraviolet unit (Sanuvox P900GX) was effective in reducing airborne viable bacteria (tuberculosis) by up to 95% percent and reduced bacterial concentrations at a rate equivalent to approximately 6 air changes per hour. To read the study in its entirety visit [www.sanuvox.com/research](http://www.sanuvox.com/research)





**MB500GX INSTALLED**



**MB500GX OPENED**



**MB500GX**



**MB500GX Ceiling Tile Mount UV Air Purifier**

The MB500GX Recessed Ceiling Mount UV Air Purifier is an innovative design for office, school and institutional facilities. The MB500GX's space saving 24" x 24" self-contained design, easily installs in the opening of a suspended ceiling.

The MB500GX uses the Sanuvox patented process to move air parallel to the UV Lamp in a reflective Aluminum Reaction Chamber, and mix the purified air around the Lamp. The MB500GX will effectively destroy chemical and biological contaminants that effect the work place environment.

Extremely quiet and the ability to purify an area of up to 500 square feet (per unit), makes this air purifier the ideal solution for the problems associated with Sick Building Syndrome.



**FEATURES**

- Ideal for offices, break-rooms, doctor's offices, waiting rooms, schools, daycare centers, call centers, etc.
- Destroys biological contaminants such as mold, bacteria, viruses, germs, allergens
- Destroys chemicals & biological odors
- 10,000 microwatts per/cm<sup>2</sup> of UV intensity inside UV Reaction Chamber
- Patented 19mm Pure Fused Quartz UVC/UVV Lamp
- Aluminum Reaction Chamber maximizes UV intensity
- High-Output Ballast
- Patented Design & Sanuvox Quality
- Warranty: Lamp 12,000 hours. Unit 2 years
- CSA C/ US Certified & CE Approved

**IDEAL FOR**

- Ideal for offices, break-rooms, doctor's offices, waiting rooms, schools, daycare centers, etc..



## S300HFX HEPA



Door open to show pre-filter and HEPA filter

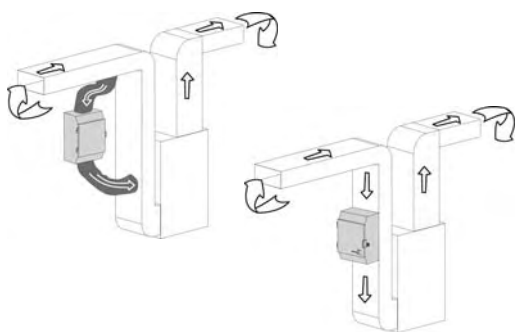
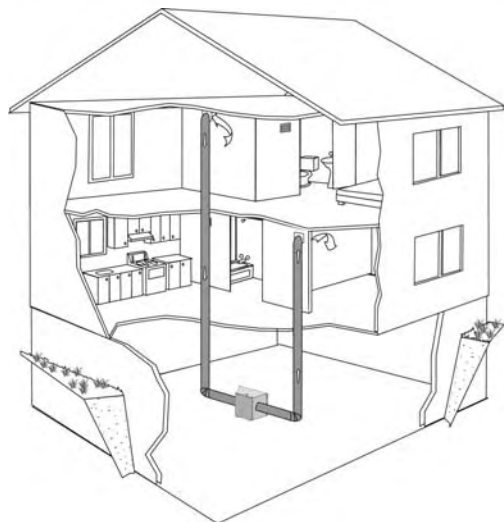
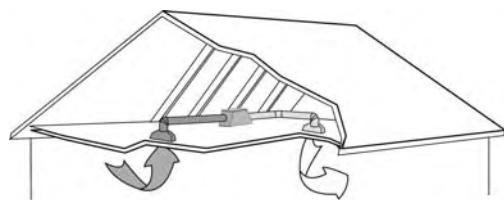
## S300HFX HEPA Filter / UV System

The S300HFX is designed for applications that require filtration and purification. The included HEPA Filter is 99.97% effective, trapping particles down to 0.03 microns in size. Purification is done through Germicidal Photo-Oxidation. The air is pulled through the Aluminum UV Reaction Chamber where the air is made to pass parallel to the UV Lamp, bombarding it with UVC & UVV, destroying the biological & chemicals in the air. The air continues to pass through the pre-filter and finally the HEPA filter.

The 300 cfm backward impeller blower is equipped with two speeds. Additional hardware is available for multiple rooms or stations. An optional vapor arm is available to capture contaminants in a lab, nail salon, etc.

By combining HEPA Filtration & UV Purification, Sanuvox is able to offer a complete IAQ solution in one unit.

## S300HFX HEPA INSTALLATION



### FEATURES

- 2" pre-filter & True 2 1/2" HEPA Filter captures particles down to 0.03 micron in size
- Destroys biological contaminants such as mold, bacteria, viruses, germs, allergens
- Destroys chemicals & biological odors
- By-pass System or Stand-Alone
- 300 cfm. 2 speed blower
- Patented 19mm High-Output Pure Fused Quartz UVC/UVV "J" Lamp
- Aluminum Reaction Chamber maximizes UV intensity
- High-Output Ballast
- Patented Design & Sanuvox Quality
- 3 Year Warranty including UV Lamp
- CSA C/ US Certified & CE Approved

### IDEAL FOR

- Residential, commercial & medical applications
- HVAC by-pass for whole system filtration / purification or Stand-alone wall mounting
- Home filtration / purification, smoking rooms, hotels, commercial buildings, laboratories, nail salons, doctor's office, hospital patient rooms, dentist offices, etc.

### ACCESSORIES

- Stand Alone Option requires Louvers for inlet & outlet. Part# MSCLOU1 (sold in pairs)
- Pair of 8" Collars for ducting in & out. Part# MSCCOL1
- Round Inlet Adaptor mounting for three 4" inlets. Part# MSCCOL2
- Fume Collector w/ table mount for applications such as nail salons and dentist office. Part# MSCCOL3
- VOC Kit includes (1) VOC Sensor, (1) Additional Ballast & (1) Additional 16" UVV (Oxidizing 187nm) Lamp. Part# SUBKITVOC5300





### S1000FX Filter / UV System

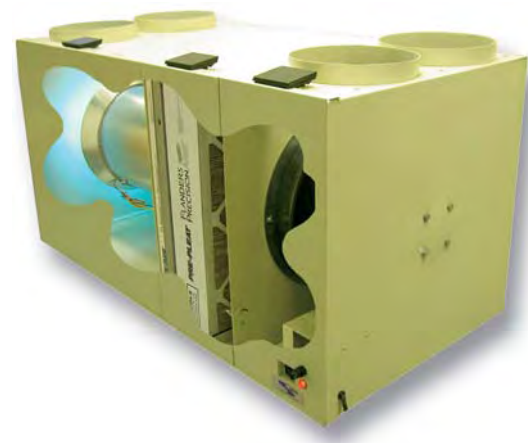
The S1000FX is a combination Ultraviolet - Filter Air Purifier. The S1000FX can be used in applications ranging from hospital clean room biological treatment, to smoking environments, to garbage room odor treatment.

In addition to the patented Sanuvox UV process, the S1000FX Clean Room option is equipped with two 30 inch UV "J" Lamps (one Germicidal UVC Lamp and one Germicidal / Oxidizing UVC / UVV Lamp) for complete biological and chemical protection. Up to four 30" UV "J" Lamps can be incorporated into the S1000FX.

The Clean Room option includes a 99.97% HEPA Filter, which will trap particles down to 0.03 microns (1 / 75000 of an inch) in size.

The S1000FX is equipped with a 1750-CFM backward impeller blower and can be used as a stand alone system, or installed into the existing ventilation system as a by-pass installation.

### S1000FX



### FEATURES

- Destroys biological contaminants such as mold, bacteria, viruses, germs, allergens
- Destroys chemicals & biological odors
- Stand-Alone installation or can be ducted to multiple rooms
- (2) two 1" pre-filters & (1) one 4" 95% ASHRAE pleated filter
- "Clean Room Option" includes HEPA Filter to capture particles down to 0.03 micron in size & additional UVC "J" Lamp
- 1750 cfm. blower. Under load with filters, 1000 cfm.
- Patented 30" 19mm Pure Fused Quartz UVC/UVV "J" Lamp
- Aluminum Reaction Chamber maximizes UV intensity
- High-Output Ballast
- Patented Design & Sanuvox Quality
- Warranty: Lamp 12,000 hours, Motor: 1 year, Ballast: 3 years
- CE Approved

### IDEAL FOR

- Ideal for smoking rooms, garbage rooms, bars, restaurants, casinos, homeless shelters, odor control
- Clean Room Option: Clean rooms, operating theatres, hospitals, manufacturing, laboratories, etc.

### ACCESSORIES

- Clean Room Option includes (1) 20" x 20" x 4" 99.97% true HEPA Filter, (1) Additional Ballast & (1) Additional 30" UVC Lamp (Germicidal 254nm). Part# SUBKITCROS1000
- VOC Kit includes (1) VOC Sensor, (1) Additional Ballast & (1) Additional 30" UVV (Oxidizing 187nm) Lamp. Part# SUBKITVOCSS1000

### S1000FX SMOKING ROOM INSTALLATION







## UV Bio-Wall PENTA Mobile Air & Surface Ultraviolet Sterilizer

The PENTA UV Bio-Wall is a self contained fully mobile decontamination unit. Equipped with a pre-timer and operational timer, the PENTA will bask surfaces and air in unoccupied areas delivering incredible concentrations of UVC (254nm) Germicidal energy destroying microbial contaminants such as mold, bacteria & viruses.



## UV BIO-WALL PENTA MOBILE



### FEATURES

- Sterilizes air and surfaces in unoccupied areas
- Available in 40", 50" and 60" Lamp lengths
- 2900 microwatts per/ cm<sup>2</sup> at 36 inches (40" Lamp Lengths)
- 5 High Intensity Pure Fused Quartz Lamps
- Aluminum Anodized Parabolic Reflectors intensifies & maximizes 360° of UV Energy
- Stainless-steel removable base with castors
- High Output Electronic Rapid-Start Ballasts
- Pre-Timer (minutes) and Operation Timer (hours)
- Control Panel with Digital Lamp Life Timer, Digital LED Status & "Lamp Out" visual and audible alarm
- Easily transportable
- Aluminum Cover protects Lamps in storage and transport
- Patented UV System
- Sanuvox Design & Quality

### IDEAL FOR

- Hospitals, clinics, laboratories, clean rooms, ICU's, burn centers, food processing, manufacturing, doctors offices, methadone clinics, operating rooms, homeless shelters, TB clinics, detention centers, kennels, dairy plants, sterile-rooms etc.

### CONTROLS





**SABER SMART**



**SABER APR**



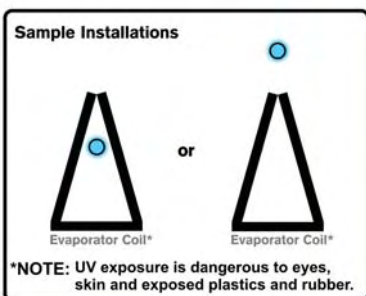
**SABER 24V**



**GRAB-AND-GO PACKAGING**



**SABER ON COIL INSTALLATION**



**Saber SMART UV Object Purifier**

The Sanuvox Saber SMART UV Purifier is designed to bask stationary objects (i.e. evaporator coil, duct walls) with UVC Germicidal Energy, preventing and destroying mold, biological odors and other microbial contaminants.

UV-C Germicidal Ultraviolet wavelength (254 nm) is effective in penetrating the cell membrane breaking the DNA structure of a microorganism, inhibiting reproduction.

The Saber SMART includes a 3" back-lit LCD display which provides Real-Time user information, including purifier status, days remaining until next Lamp change-out, intensity animation and Replace Lamp notifications.



Only the Saber SMART provides important user information & purifier status



A dirty coil impedes airflow losing efficiency making the system work harder increasing energy costs



A clean coil will maintain proper energy exchange and air-flow reducing the need for future cleaning while saving energy & maintenance costs

**FEATURES**

- 16" UV-C Lamp to destroy mold & other microbial growth including biological odors on the coil & surrounding area
- 3" LCD Display provides "Real Time" system status
  - Electro-Blue Back-Light Display
  - Countdown Display
  - Lamp Out Visual Alarm
  - Purifier Operational Animation
  - Visual Status Display
- Tested by Penn State University\*
- Various mounting scenarios
- 110V Plug & Play
- Cotton Gloves included
- 1 year warranty including UV Lamp

\* The Saber SMART has been tested by Penn State University and has shown to destroy 99% of spore forming B. Subtilis in less than two minutes at a distance of 12".





COILCLEAN INSTALLED



COMMERCIAL UV CoilCleaners

The patent pending Sanuvox CoilClean purifiers are designed to prevent and destroy mold and other microbial contaminants from rooftops coils, fan coils, walk-in A/C coils and the air. High-Intensity 19mm Quartz UVC (254nm) Lamps and High-Output Electronic Ballasts paired with Anodized Aluminum Parabolic Reflectors make the CoilClean Series incredibly effective.

Anodized Aluminum Parabolic Reflectors are able to direct virtually all the UV Energy onto the coil or the air. Besides increasing UV exposure, the Reflector also protects plastics and wiring from destructive UV rays. How powerful would a flashlight or headlight be without a reflector? UV Light is no different. Reflection is needed to direct the UVC energy where needed most. Using any other UV Lamp/Emitter will result in losing more than half the UV Intensity.

- Destroys mold and other microbial growth on the "Object" as well as biological odors
- Improves energy savings & reduces maintenance by keeping the coil clean
- High-Intensity 19mm UVC Quartz Lamp
- Patent pending Anodized Parabolic Reflector reflects and directs UV Energy while protecting plastics from destructive UV Rays
- University tested & results published in The Lancet Medical Journal
- Higher UV intensity & reliability than other UV Lamp / Emitters
- 5X longer warranty than competing products
- Optional building automation, electronics and software (see bottom of page 27 for full description)
- More than twice the operating life compared to competing products
- Ideally installed on the return side of the coil, requiring little or no maintenance

TESTING



In a two year double blind study published in The Lancet Medical Journal sponsored by The Medical Research Council and The National Institute for Occupational Safety and Health (NIOSH), McGill University Researchers found Sanuvox UV CoilClean Purifiers to:

- **reduce microbial and endotoxin concentrations by 99%**
- **reduce respiratory symptoms by 40%**
- **reduce all symptoms by 20%**

Visit [www.sanuvox.com/research](http://www.sanuvox.com/research)



### CoilClean IL

The CoilClean IL is designed to be installed facing the return side (or supply side) of a commercial evaporator coil or fancoil, destroying and preventing mold and other microbial growth.

The CoilClean In-Line (IL) are available in 12", 18", 24", 30", 40", 50" & 60" Lamp lengths. A combination of CoilClean IL's can be used to accommodate any size coil. Lamp Change-out: Replace Lamps after 17,000 hours of operation. Warranty is 12,000 hours from installation.

### CoilClean RT

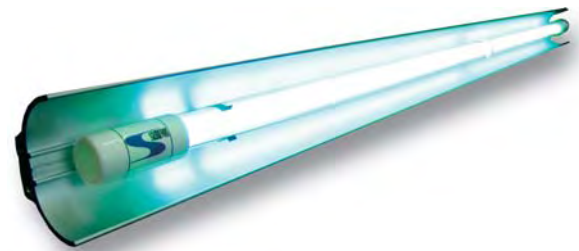
The Sanuvox CoilClean RT is an Ultraviolet Object Purifier specifically designed for exterior rooftop HVAC units. The CoilClean RT employs Patented Sanuvox Technology to keep the A/C coil free from biological contaminants including mold and fungus. The UV Purifier uses a weatherproof NEMA 4X Housing, a patent pending Reflector locking and alignment mechanism, a High Intensity 19mm Quartz Germicidal Lamp and an Aluminum Anodized Parabolic Reflector to direct the UV Energy that would otherwise be lost, ensuring a coil free from microbial growth. The CoilClean RT are available with 24", 30", & 40" Lamp lengths.

### CoilClean B30X

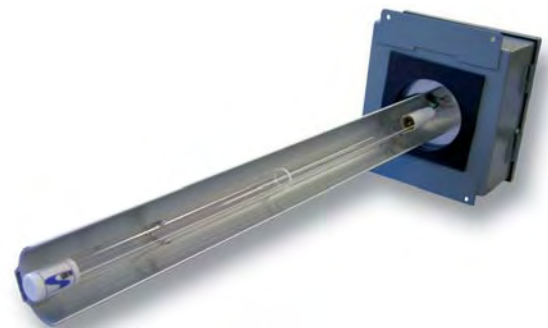
The Sanuvox B30X UV Air Purifier / CoilCleaner is designed for easy after market installation on Bard Wall Mount HVAC Units (can be easily adapted for other manufacturers). The B30X UV Air Purifier / CoilCleaner uses UV-C (254nm) and UV-V (187nm) Energy to destroy biochemical contaminants such as mold, mildew, fungus spores, formaldehyde, solvents and secondhand smoke. The B30X will also irradiate viruses and bacteria such as legionella, tuberculosis, MS2 and meningitis to name a few.

The patent pending Parabolic Reflector / Shield uses the full 360 degrees of UV Light to eradicate contaminants in the air and on the coil while protecting motor windings, plastics and people from UV exposure.

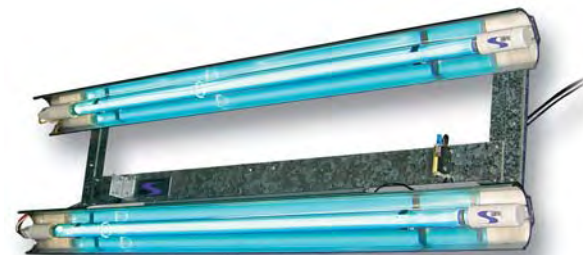
COILCLEAN IL



COILCLEAN RT



COILCLEAN B30X



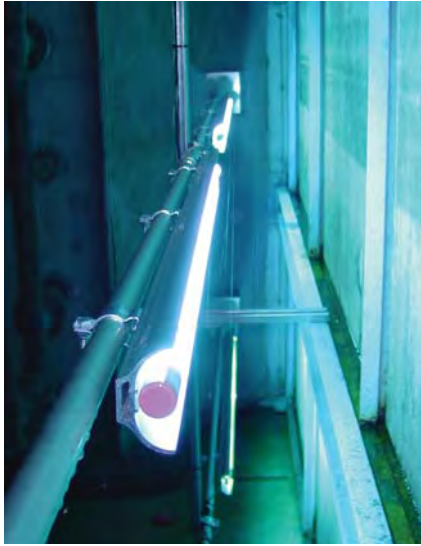
### TESTING

|                       | BEFORE  | AFTER  | IAQ-STK™ GUIDELINES       |
|-----------------------|---------|--------|---------------------------|
| Total Fungal Elements | 1,103   | 391    | 100 cts/m <sup>3</sup>    |
| Total Pollen          | 10      | 5      | 10 cts/m <sup>3</sup>     |
| Skin Cell Fragments   | 3,805   | 1,149  | 2,500 cts/m <sup>3</sup>  |
| Opaque Particles      | 108,207 | 18,621 | 50,000 cts/m <sup>3</sup> |

Independent Laboratory tests showed dramatic IAQ improvement after the Sanuvox CoilClean B30X Purifier was installed.

Source: Pure Air Control Services, Clearwater, FL





Sanuvox UV CoilClean Sizing Matrix Software empowers installers and end-users with an easy to use application to size their very own coils.

The easy-to-use software provides detailed information for all related issues in regards to sizing UV systems for coils.

Information provided include:

- How many UV CoilClean fixtures required on the user specified coil.
- User selects preference of Upstream or Downstream side of the coil.
- Illustrated mounting guide shows where the UV fixtures should be placed for maximum efficiency.
- Real-Time UV efficiency and kill rate are provided at "end of Lamp Life" which is at 17 000 hours of operation.
- Real-Time Kill Rate in minutes based on the resilient bacterial spore aspergillus Niger.

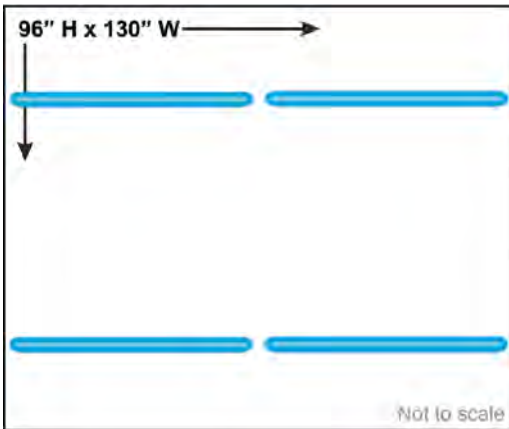
The Sanuvox Aluminum Parabolic Reflector\* directs virtually 100% of the germicidal UV energy produced onto the coil reducing the number of UV fixtures required, while dramatically extending effective Lamp life.

\*patent pending

### EXAMPLES OF WHAT IS INCLUDED IN THE SIZING MATRIX

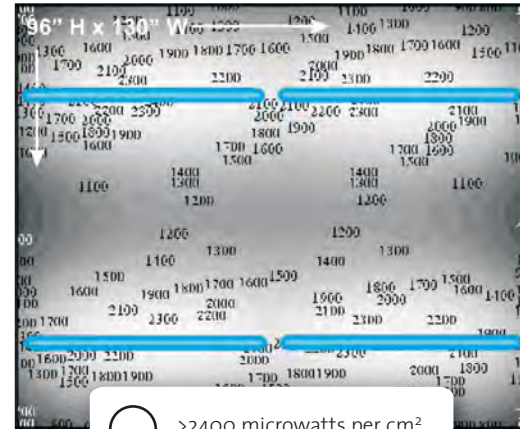
In this example, the UV CoilClean Sizing Matrix bases all calculations on an Upstream (return side) installation on a coil measuring 130" wide by 96" high. The following information is generated by the Matrix and provided in a user-friendly PDF report.

Figure A. Position of UV CoilClean ILs on the coil



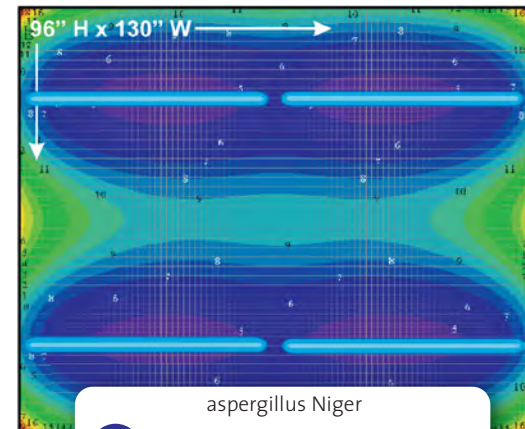
This Coil requires two (2) rows of two (2) CoilClean IL 60" per row

Figure B. Measured UV intensity on the coil @ 18"



- >2400 microwatts per cm<sup>2</sup>
- 1200 microwatts per cm<sup>2</sup>
- 553 microwatts per cm<sup>2</sup>

Figure C. Bio-contaminant survival time on the coil



aspergillus Niger

- 5 min. to 99+% sterilization
- 11 min. to 99+% sterilization
- 16 min. to 99+% sterilization
- 20 min. to 99+% sterilization

The included Kill-Rates are based on "end of Lamp life" which is after 2 years of continuous operation (17 000 hours). Kill Rates from "Day 1" will be exponentially higher.

Aspergillus Niger will take 5 minutes (purple area) of irradiation for 99+% destruction. The 4 corners will be receiving the least amount of UV intensity (approx. 550 microwatts as per Figure B.) requiring not more than 20 minutes for 99+% destruction. The average time across the coil for 99+% destruction will be 8 minutes.

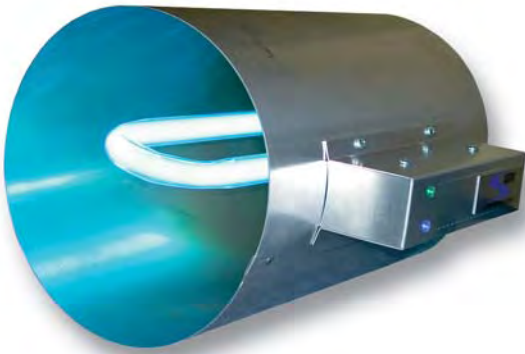


Available at no-charge. Real-Time Sizing Software.

Call 1-888-726-8869 for your copy today.



HRV



HRV ultraviolet Air Purifier

The HRV UV Air Purifier is specifically designed to be connected to the “fresh air to inside duct” of an HRV / ERV unit. With a powerful proprietary UV-C / UV-V (Germicidal / Oxidizing) Lamp, the HRV Purifier uses the patented Sanuvox process to destroy the biological and chemical contaminants as well as odors which would have otherwise been distributed throughout the ventilation system. The HRV UV Purifier is available in both 6” & 8” diameters.

Commercial Odor & Chemical Exhaust Option

For applications where exhausted air may have high levels of chemical and/or odors and need to be treated. The HRV can be fitted with a UVV ONLY (187nm) Lamp to oxidize the chemical contaminants as they are exhausted outside. Applications include: **waste water processing, restaurants, hospitals, animal farms, manufacturing facilities, etc.**

\*Multiple HRV units can work in series for any size exhaust. Custom applications available.

|                                   |  |
|-----------------------------------|--|
| Outside Dimensions: HRV 6         | 12" high x 6" wide   |
| Outside Dimensions: HRV 8         | 12" high x 8" wide   |
| Weight:                           | 3 lbs.   |
| Power Requirements: HRV 6         | 120V / 230V 15 watts   |
| Power Requirements: HRV 8         | 120V / 230V 25 watts   |
| Installation:                     | Hardwired to HRV / ERV   |
| UV Lamp Dimensions: HRV 6         | J type (Proprietary) Ultraviolet Dual Zone Lamp 19 mm Dia. Length 6.5". Arc length 10.5" |
| UV Lamp Dimensions: HRV 8         | Length 10.5". Arc length 17.7"   |
| UV Aluminum Reflector Tube: HRV 6 | 6" Dia. x 12" Long Aluminum Reflective Tube  |
| UV Aluminum Reflector Tube: HRV 8 | 8" Dia. x 12" Long Aluminum Reflective Tube  |
| Certifications:                   | CSA C/US, CE   |
| Warranty:                         | 3 years including Lamp   |

CMU



CMU Ceiling Mount UV Air Purifier

The CMU-18 & CMU-24 mount in the return plenum filter box just before the filter. The proprietary UV-C / UV-V (Germicidal / Oxidizing) Lamp is housed in an Aluminum Reflecting Box which intensifies the UV energy. The CMU destroys biological and chemical contaminants that travel throughout the system. Equipped with a Safety Cut-Off switch that disconnects power when filter is removed. The CMU-18 is for use in a plenum filter box with a return duct up to 18" diameter and the CMU-24 is for a filter box between 20" and 24" diameter. Filter box is field supplied.

|                                   |   |
|-----------------------------------|---|
| Dimensions:                       | 19 1/2" x 16 3/4" X 4 3/4"                                    |
| Minimum Filter Box Size Required: | 20" x 20" x 6"  |
| Weight:                           | 6 lbs   |
| Power Requirements:               | 120V / 230V 15 watts  |
| UV Lamp Dimensions CMU-18:        | J type (Proprietary) Ultraviolet Lamp Dia.19 mm. Length 6.5"  |
| Lamp Arc Length:                  | 10.5"   |
| UV Lamp Dimensions CMU-24:        | J type (Proprietary) Ultraviolet Lamp Dia.19 mm. Length 10.5" |
| Lamp Arc Length:                  | 17.7"   |
| UV Reflector:                     | Aluminum Reflective Box                                       |
| Airflow                           | Depends on Air Handler  |
| Installation:                     | Ceiling Filter Box Lay-In                                     |
| Certification:                    | CSA C/US, CE  |
| Warranty:                         | 3 years including Lamp  |





**TECHNOLOGY EVALUATION REPORT**

# Biological Inactivation Efficiency by HVAC In-Duct Ultraviolet Light Systems

## Sanuvox Technologies Inc. UV Bio-Wall 50 Outwardly Projecting Air Purifier

Office of Research and Development  
National Homeland Security  
Research Center

### Notice

The U.S. Environmental Protection Agency (EPA), through its Office of Research and Development's National Homeland Security Research Center (NHSRC), funded and managed this technology evaluation through a Blanket Purchase Agreement (BPA) under General Services Administration contract number GS23F0011L-3 with Battelle, with RTI under subcontract to Battelle. This report has been peer and administratively reviewed and has been approved for publication as an EPA document.

### Executive Summary

The U.S. Environmental Protection Agency's (EPA's) National Homeland Security Research Center (NHSRC) Technology Testing and Evaluation Program (TTEP) is helping to protect human health and the environment from adverse impacts resulting from acts of terror by carrying out performance tests on homeland security technologies. Under TTEP, RTI recently evaluated the performance of the Sanuvox Technologies Inc. UV Bio-Wall Outwardly Projecting Air Purifier. The objective of testing the device was to evaluate its bioaerosol inactivation efficiency as a heating, ventilation and air-conditioning (HVAC) in-duct ultraviolet light system.

The product was tested using a test plan approved by EPA, *Test/QA Plan for Biological Inactivation Efficiency by HVAC In-Duct Ultraviolet Light Air Cleaners*.



Figure 2-1. Ballast box installed on the outside of the test rig.



Figure 2-2. Device installed inside the test rig. There are 5 lamps. A reflective surface was placed in the duct.

(1) The tests were conducted using three organisms, two bacteria *Bacillus atrophaeus* (surrogate for anthrax spore) and *Serratia marcescens* and one bacterial virus (MS2). These organisms were selected because their sizes, shapes and susceptibility to UV inactivation make them reasonable surrogates for biological warfare agents (BWAs). Generally, vegetative bacteria are readily killed and bacterial spores are more difficult. To model use in an HVAC system, RTI used a test duct designed for testing filtration and inactivation efficiencies of aerosol, bioaerosol, and chemical challenges.

The bioaerosol inactivation efficiencies calculated for the three organisms were 93% on \*one pass for *B. atrophaeus* (surrogate for anthrax spore), >99.97% \*on one pass for *S. marcescens* (bacteria) and 99% \*on one pass for MS2 (bacterial virus). The irradiance was measured as 1200  $\mu\text{W}/\text{cm}^2$  at 133 cm (52.4 in.) upstream from the closest glass part of the lamps with an airflow of 0.93  $\text{m}^3/\text{sec}$  (1970 cfm). The system had five lamps that were burned in for 100 hours prior to measurements.

\* One pass inactivation with no re-circulation by the UV System.



### What is it you want to treat? The AIR or the A/C COIL?

Sanuvox divides the commercial line into two categories: a) **UV OBJECT PURIFICATION** and b) **UV AIR PURIFICATION**.

**Sanuvox UV Object Purifiers** named appropriately the “CoilClean series”, are High-Intensity or Amalgam 19mm UVC (Germicidal 254nm) Mercury Vapor Quartz Lamps mounted to Anodized Aluminum Parabolic Reflectors. These systems are designed to bask stationary Objects (usually an A/C COIL) with UVC light preventing and destroying mold and other microbial growth on the object. Although very effective in keeping a stationary object clean, UV Lamps shining on an object will have little effect on any other Indoor Air Quality (IAQ) concerns outside of a mold laden coil. UV CoilCleaners will have little effect on the air duct. By treating the air in the duct with UV Air Purifiers (see UV Air Purifiers) they will also keep the coil clean by reducing the biological contaminants in the air.

**Sanuvox UV Air Purifiers** are specially designed to drastically improve the air quality in the building or facility. Sanuvox proprietary systems make it possible to deliver high amounts of UV energy to the air-stream while increasing “dwell time” between the air and the UV purifier.

Sanuvox UV Air Purifiers use proprietary Dual Zone High-Intensity or High-Intensity Amalgam 19mm UVC (Germicidal 254nm) UVC (Oxidation 187nm) Mercury Vapor Quartz Lamps to destroy biological and chemicals in the air.

### How does ultraviolet light destroy biological & chemical contaminants?

Sanuvox purifiers use proprietary High-Intensity or Amalgam 19mm Mercury Vapor Hot Cathode Quartz Lamps that produces UVC and UVV light (both wavelengths are fused into the Lamp). UVC is short-wave radiation; it attacks the DNA of the cell. This wavelength’s primary uses are for the destruction of biological contaminants such as mold, bacteria and viruses. The Centers for Disease Control (CDC) recommends this method for destroying viruses such as tuberculosis. UVV is primarily used for oxidization; this is the portion of the lamp that will destroy chemicals and odors such as cigarette smoke, VOCs, diesel fumes, formaldehyde, amongst others. With both UV wavelengths working together, Sanuvox UV Air Purifiers are able to destroy thousands of biological and chemical contaminants.

### How do I select the right Sanuvox UV Purifier for the job?

If you have questions, or an application you want us to help you with, please do not hesitate to contact Sanuvox at 1-888-SANUVOX (726-8869) or 514-382-5823. Let our engineers and experts do the selection and sizing with you. Our goal is to support you guaranteeing your customer’s needs are met.

### How is Sanuvox Technologies different than other UV Purifier Manufacturers?

Established in 1995, Sanuvox has received multiple U.S. and Canadian patents on the UV process that is being heralded as the standard in the industry. Unlike manufacturers that market conventional Object Purifiers, Sanuvox offers Engineered Systems for both Object & Air for virtually any IAQ application. Sanuvox factory support is unmatched. We will provide you with the support needed in order to solve your customer’s IAQ needs. Sanuvox Purifiers are used in tens of thousands of applications ranging from private, commercial and medical, to government and military installations.

Visit [www.sanuvox.com/applications](http://www.sanuvox.com/applications) to see a partial list of who uses Sanuvox UV Systems.

### What types of systems does Sanuvox manufacture?

Sanuvox manufactures a complete line of residential, commercial and industrial UV systems, including In-Duct Ultraviolet Air Purifiers, UV CoilCleaners, UV stand-alone systems as well as combination HEPA UV Filter / Air Purifiers.

### Do Sanuvox Ultraviolet Air Purifiers produce ozone?

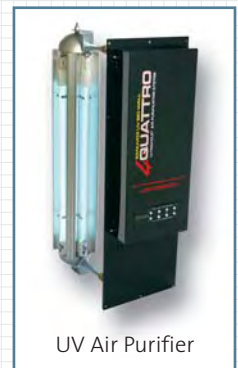
As part of the proprietary Sanuvox process involved in UV air treatment, the UVV (187nm) portion of the Lamp is fused to the UVC (254nm) portion of the glass. Sanuvox Lamps are not ozone generators; ozone is a byproduct of oxidation. As the oxidation is emitted from the UVV portion of the Lamp, the UVC wavelength immediately starts to break down residual ozone that may be present. Sanuvox is treating the chemical contaminants in the air at that moment in time; this is one of the components of the Sanuvox patent.

The amount of residual ozone produced by a Sanuvox UV Air Purifier with the UVC/UVV Lamp has been measured by independent accredited testing laboratories and found not to exceed 0.0035 parts per million at the outlet of the purifier, which can be less than the ozone level outside. This is less than 1/10 of the ASHRAE limit (0.05 ppm) and less than 1/20th of the OSHA (0.10 ppm) standards for safe ozone levels. In fact, the oxidation process produces less residual ozone than a photocopier or the arcing from an electronic air cleaner, and in documented air quality tests, zero ozone levels have been found in the living or working area.

\*All Sanuvox systems are available with UVC Germicidal Lamps (no UVV) upon request at no additional charge.



UV Object Cleaner



UV Air Purifier

## How can Sanuvox Air Purifiers destroy up to 99.999% of the contaminants traveling through the HVAC system?

Sanuvox UV Air Purifiers are sized according to the application. Taking into account the duct size, air velocity, % of fresh air and the contaminant(s) to be destroyed, Sanuvox can size the application in order to achieve up to 99.999% destruction on one pass. Need help sizing? Just call 514-382-5823 or 1-888-SANUVOX(726-8869).

## What is a URV rating and how does it relate to Ultraviolet Air Purification?



Ultraviolet Rating Value (URV) is a proposed standard by the International Ultraviolet Association (IUA) in response to an industry-wide need for standards and guidelines for evaluating Ultraviolet Air Purification efficiencies. On the adjacent page you will note a URV value on select Sanuvox Ultraviolet Air Purifiers. For example: A URV rating of 14 and greater represents 100% destruction on tuberculosis. A URV rating of 11 represents 88% destruction on tuberculosis. A URV rating of 10 represents 41% destruction on tuberculosis.

See opposite page Table 1: URV Rating Values & Typical Kill Rates.



## How are Sanuvox UV CoilCleaners different than other UV Lamps / Emitters used to destroy mold on an A/C coil?

All Sanuvox Ultraviolet Lamps use the highest efficiency Quartz glass (highest quality glass with the least amount of impurities). Sanuvox patented Hot Cathode High-Intensity or Amalgam Mercury Vapor 19mm Lamps produce the highest efficiency, cleanest burning Lamp available, paired to high-output electronic ballasts.

Only Sanuvox UV CoilCleaners use patent pending Anodized Aluminum Parabolic Reflectors to direct the UVC Germicidal (254nm) light onto the Object. If a UV Lamp is shining on an Object without a Parabolic Reflector, less than 40% of the Lamp's energy is actually shining on the Object. With the addition of the Parabolic Reflector, Sanuvox is directing virtually all of the Lamps energy where it is needed.

## Can a UV Lamp on a Coil also treat the air-stream?

Because UV Lamps on a coil are installed perpendicular to the air, there is not sufficient amount of "Dwell Time" between the Lamp and the air-stream, consequently the effect on the air is much less than a parallel installation. For a UV Lamp to be effective as an air purifier, the Lamp(s) must be parallel to the air-stream. If Lamps are to be installed perpendicular, many more Lamps would be required in order to achieve the necessary "Dwell Time".

## Are there research studies done on Sanuvox UV Systems?

The Sanuvox Research & Design Team is made up of Scientists, PhD's, Engineers, and experts in Air Quality and Air Management. All research studies done on Sanuvox Systems are Independent Third Party, using various Sanuvox UV Purifiers, some of these studies have been published in various medical journals including the prestigious Lancet Medical Journal and Infection Control & Hospital Epidemiology. In 2006, The EPA (Environmental Protection Agency) and The NHRSC (U.S. National Homeland Security Research Center) tested the Sanuvox UV Bio-Wall on Biological Warfare Agents. The UV Bio-Wall achieved >99.97% destruction on bio-warfare agents on one pass. Many UV manufacturers site Sanuvox research to show the efficacy of UV Treatment.

Visit [www.sanuvox.com/research](http://www.sanuvox.com/research) to view the studies.



## Is a Sanuvox UV Purifier safe?

Sanuvox Air Purifier are CSA C/US certified and CE approved. Two factors relating to safety are: (1) exposure to UV rays is damaging to the eyes and skin and (2) direct UV exposure destroys plastic.

## What are the applications and uses for Sanuvox UV Purifiers?

Sanuvox Air Purifiers will destroy biological and chemical contaminants, odors such as bacteria, viruses, mold, mildew, smoke, formaldehyde, cleaning solvents, etc. See page 25 for a partial list of contaminants treated by Sanuvox.

Sanuvox Purifiers are used in tens of thousands of homes, doctors and dentists' offices, hospitals, veterinary clinics, office buildings, government facilities, railway stations, health clubs, yoga studios, day care centers, laboratories, class rooms, old age homes, hotels, smoking rooms, bars and restaurants, mausoleums, funeral parlors and morgues.

## What is my Sanuvox CoilClean warranty?

All Sanuvox UV CoilCleaners are warranted for 5 years (including ballast); the UV Lamp is warranted for 12,000 hours.

## What is my Sanuvox UV Air Purifier warranty?

Please refer to [www.sanuvox.com](http://www.sanuvox.com) for the specific warranty on the Sanuvox product that interests you. All commercial UV Lamps are warranted for 12,000 hours.

### COMPETITIVE COMPARISON

|                 | SANUVOX     | LEADING COMPETITOR |
|-----------------|-------------|--------------------|
| Lamp Change-Out | 17,000 hrs. | 8,000 hrs.         |
| Lamp Warranty   | 12,000 hrs. | 2,160 hrs.         |
| Fixture         | 5 Years     | 1 Year             |



## COMMON BIOLOGICAL & CHEMICAL CONTAMINANTS

Listed are some common odors, chemical pollutants and biological contaminants that are destroyed using a Sanuvox Ultraviolet Air Purification System.

|                     |                            |                     |                      |
|---------------------|----------------------------|---------------------|----------------------|
| Acetone             | Decaying Substances        | Lactic Acid         | Poultry Odors        |
| Alcoholic Beverages | Deodorants                 | Liquor Odors        | Rubber               |
| Animal Dander       | Diesel Fumes               | Masking Agents      | Sewer Odors          |
| Animal Odors        | Embalming Odors            | Methyl Alcohol      | Smoke                |
| Anesthetics         | Ethyl Alcohol              | Mildew              | Spoiled Food         |
| Asphalt Fumes       | Eucalyptol                 | Mold                | Tar                  |
| Automobile Exhaust  | Exhaust Fumes              | Nail Polish         | Tarnishing Gases     |
| Bacteria            | Fabric Finishes            | Naphtha (Coal tar)  | Tobacco Smoke        |
| Bathroom Odors      | Fecal Odors                | Naphtha (Petroleum) | Turpentine           |
| Body Odors          | Fertilizer                 | Nicotine            | Vapors               |
| Burned Flesh        | Film Processing Odors      | Noxious Gases       | Varnish Fumes        |
| Burned Food         | Fish                       | Organic Chemicals   | Vinegar              |
| Charred Materials   | Formaldehyde               | Packing House Odors | Viruses              |
| Cheese Kitchen      | Fuel Gases                 | Paint               | Volatile Materialize |
| Cigarette Smoke     | Garlic                     | Paste & Glue        | Waste Products       |
| Coal Smoke          | Gasoline                   | Perfumes, Cosmetics | Xylene               |
| Combustion Odors    | Hair Spray                 | Perspiration        |                      |
| Cooking Odors       | Incomplete Combustion      | Pet Odors           |                      |
| Creosote            | Industrial Wastes Kerosene | plastics            |                      |

### Common Microorganisms

|                       |                      |                      |                       |
|-----------------------|----------------------|----------------------|-----------------------|
| Bacteria              | Viruses              | Dysentery bacilli    | S. tyhimurium         |
| Protozoa              | Tuberculosis bacilli | Mold Spores          | Staphylococcus aureus |
| Measles               | Influenza            | Lengioncellosis      |                       |
| S. enteritidis        | B. paratyphosus      | Bacillus anthracis   |                       |
| Eberthella typhosa    | Escherichia coli     | B. subtilis          |                       |
| Meisseria catarrhalis | Proteus vulgaris     | Micrococcus candidus |                       |

**Table 1: URV Rating Values & Typical Kill Rates**

|   | DOSE ( $\mu\text{W}\cdot\text{S}/\text{CM}^2$ ) | ANTHRAX (Kill, %) | INFLUENZA (Kill, %) | SMALLPOX (Kill, %) | TB (Kill, %) |   |
|---|---|-------------------|---------------------|--------------------|--------------|---|
| 1   | 1   | 0                 | 0                   | 0                  | 0            | <b>UV Bio-Wall QUATTRO:</b><br>URV Rating 14 at 2,500 CFM through the entire duct |
| 2   | 10  | 0                 | 1                   | 2                  | 2            |   |
| 3   | 20  | 0                 | 2                   | 3                  | 4            |   |
| 4   | 30  | 0                 | 3                   | 4                  | 6            | <b>UV Bio-Wall 60":</b><br>URV Rating 19 at 10,000 CFM through the entire duct    |
| 5   | 50  | 1                 | 6                   | 7                  | 10           |   |
| 6   | 75  | 1                 | 9                   | 11                 | 15           |   |
| 7   | 100   | 2                 | 11                  | 14                 | 19           |   |
| 8   | 150   | 2                 | 16                  | 20                 | 27           | <b>MB500GX:</b><br>URV Rating 19 at 70 CFM  |
| 9   | 250   | 4                 | 26                  | 32                 | 41           |   |
| 10  | 500   | 8                 | 45                  | 53                 | 66           |   |
| 11  | 1000  | 15                | 69                  | 78                 | 88           | <b>P900GX:</b><br>URV Rating 19 at 70 CFM   |
| 12  | 1500  | 22                | 83                  | 90                 | 96           |   |
| 13  | 2000  | 28                | 91                  | 95                 | 99           |   |
| 14  | 3000  | 39                | 97                  | 99                 | 100          | <b>S300HFX:</b><br>URV Rating 19 at 300 CFM                                       |
| 15  | 4000  | 49                | 99                  | 100                | 100          |   |
| 16  | 5000  | 57                | 100                 | 100                | 100          |   |
| 17  | 6000  | 63                | 100                 | 100                | 100          | <b>S1000FX:</b><br>URV Rating 16 at 1,000 CFM.                                    |
| 18  | 8000  | 74                | 100                 | 100                | 100          | URV Rating 20 with Clean Room Option  |
| 19  | 10000   | 81                | 100                 | 100                | 100          |   |
| 20  | 20000   | 96                | 100                 | 100                | 100          |   |
| <b>k, <math>\text{cm}^2/\mu\text{W}\cdot\text{s}</math></b> |   | 0.000167          | 0.001187            | 0.001528           | 0.002132     |   |

# SPECIFICATIONS

|  | <b>R1700GX</b>  | <b>R4000XB</b>  | <b>R4000GX</b>  |
|--|---|---|---|
| Purifying Capacity                                   | 1700 sq ft  | 4000 sq ft  | 4000 sq ft  |
| Outside Dimensions (in)                              | 9.5x7.75x12 inches                                      | 13.5x8x12 inches  | 13.5x8x12 inches  |
| Weight (lbs)   | 4.5   | 8   | 8   |
| Power  | 110/220 v 50-60 Hz                                      | 110/220 v 50-60 Hz                                      | 110/220 v 50-60 Hz                                      |
| Watts/amperage                                       | 27w/730ma   | 37w/650ma   | 37w/650ma   |
| Starting   | Hardwire to Air Handler                                 | Hardwire to Air Handler                                 | Air Pressure Sensor                                     |
| Line Cord  | No  | No  | Yes   |
| UV Lamp type   | Proprietary High Intensity<br>19mm Mercury Vapor Quartz | Proprietary High Intensity<br>19mm Mercury Vapor Quartz | Proprietary High Intensity<br>19mm Mercury Vapor Quartz |
| UV Wavelength  | UVC 254nm / UVV 187nm                                   | UVC 254nm / UVV 187nm                                   | UVC 254nm / UVV 187nm                                   |
| UV Lamp Configuration                                | J Shaped  | J Shaped  | J Shaped  |
| UV Lamp length (in)                                  | 6.5 inches  | 10.5 inches   | 10.5 inches   |
| UV arc length (in)                                   | 10.5 inches   | 17.7 inches   | 17.7 inches   |
| Internal Lumina Lamp coating to prevent solarization | Yes   | Yes   | Yes   |
| Reaction Chamber                                     | 6" Aluminum sq. tube                                    | 6" Aluminum sq. tube                                    | 6" Aluminum sq. tube                                    |
| Average Microwatt intensity inside Reaction Chamber  | 10,212  | 16,479  | 16,479  |
| Lamp Change Out Time                                 | 3 Years   | 3 Years   | 3 Years   |
| Lamp Warranty  | 3 Years   | 3 Years   | 3 Years   |
| Purifier Warranty                                    | 3 Years   | 3 Years   | 3 Years   |
| Construction   | Steel/Powder Coat Paint                                 | Steel/Powder Coat Paint                                 | Steel/Powder Coat Paint                                 |

|  | <b>UV Bio-Wall QUATTRO</b>                               | <b>UV Bio-Wall (18"/24"/30"/40"/50"/60")</b>   | <b>UV Bio-Wall PENTA</b>                                      |
|--|--|--|---|
| Purifying Capacity                                   | Sized according to application                           | Sized according to application   | Air & Surface Sterilizer. Depends on area                     |
| Dimensions (in)                                      | 24x8. Lamp assembly can extend up to 15" from back-plate | Diameter: 5.25"<br>Overall length is Lamp length + 6.5 inches                                  | 47" x 28"   |
| Weight (lbs)   | 28 lbs.  | Depending on model.<br>Bio60: 11 lbs.  | 30 lbs.   |
| Power  | 110/220 v 50-60 Hz                                       | 110 or 220 v 50-60 Hz  | 110 or 220 v 50-60 Hz   |
| Watts/amperage total                                 | 170 watts. 2.5A  | According to model<br>Up to 750 Watts. 7.5A  | 500 Watts. 5A   |
| Starting   | Air Pressure Sensor                                      | Hardwire to Air Handler  | Pre-Timer. Operational Timer                                  |
| Line Cord  | Yes  | No   | Yes   |
| UV Lamp type   | Proprietary High Intensity<br>19mm Mercury Vapor Quartz  | Proprietary High Intensity<br>19mm Mercury Vapor Quartz  | Proprietary High Intensity<br>19mm Mercury Vapor Quartz       |
| UV Wavelength Nanometers (nm)                        | UVC 254nm / UVV 187nm                                    | UVC 254nm / UVV 187nm  | UVC 254nm   |
| UV Lamp Configuration                                | (4) x Straight   | (5) x Straight   | (5) x Straight  |
| UV Lamp length (in)                                  | 18 inches  | 18", 24", 30", 40", 50", 60" available   | 40", 50", 60"   |
| Internal Lumina Lamp coating to prevent solarization | Yes  | Yes  | Yes   |
| Reflector  | Anodized Aluminum Parabolic Reflectors                   | Anodized Aluminum Parabolic Reflectors   | Anodized Aluminum Parabolic Reflectors                        |
| Average Microwatt intensity at 36"                   | 1,600 µw   | Up to 3300µw depending on Bio-Wall Purifier  | 2000 µw   |
| Lamp Change Out Time                                 | 17000 hours  | 17000 Hours  | 17000 Hours   |
| Lamp Warranty  | 12000 hours  | 12000 Hours  | 12000 Hours   |
| Purifier Warranty                                    | 3 Years Ballast. 5 years other                           | 5 Years Ballast. 5 years other   | 3 Years Ballast. 5 years other                                |
| Construction   | Steel/Powder Coat Paint                                  | Aluminum/Steel   | Aluminum/Stainless Steel                                      |
| Options  | Ultra-High Intensity Amalgam Lamps.                      | 277 v option available<br>Ultra-High Intensity Amalgam Lamps.                                  | 277 v option available<br>Ultra-High Intensity Amalgam Lamps. |
| Software   | N/A  | Proprietary electronics & software to monitor each purifier via building computer maintenance. | N/A   |

|   | <b>P900GX Portable</b>                |
|---|---------------------------------------|
| Purifying Capacity  | 900 sq ft                             |
| Outside Dimensions  | 3.75x11.6x18.75                       |
| Weight (lbs)  | 11                                    |
| Air Inlet   | 7x2.5 inches                          |
| Air Outlet  | 7.5x3.25 inches                       |
| Power   | 120 / 230 v, 33 Watts                 |
| Airflow Under-Load  | Variable speed: 40-75 cfm             |
| Filter Type   | Permanent Aluminum Mesh               |
| UV Lamp type  | Proprietary 19mm Mercury Vapor Quartz |
| UV Wavelength   | UVC 254nm / UVV 187nm                 |
| UV Lamp Configuration                                       | J Shaped                              |
| UV Lamp length (in)   | 6.5 inches                            |
| UV arc length (in)  | 10.5 inches                           |
| Internal Lumina Lamp coating to prevent solarization        | Yes                                   |
| Aluminium Reaction Chamber                                  | Aluminum Reflector Box                |
| Average Microwatt intensity inside aluminum reactor chamber | 8,540                                 |
| Lamp Change Out Time  | 3 years                               |
| Lamp Warranty   | 3 years                               |
| Purifier Warranty   | 3 Years Ballast. 1 year Motor         |
| Construction  | Steel/Powder Coat Paint               |
| Stand   | Built-In                              |

Specifications are subject to change without notice



# SPECIFICATIONS

|   | <b>S1000FX</b>   | <b>S300HFX</b>                                       | <b>MB500X</b>                         |
|---|--|--|---------------------------------------|
| Purifying Capacity                                    | Sized according to application                           | Sized according to application                       | 500 sq ft per purifier                |
| Outside Dimensions (in)                               | 20x20x41 inches  | 17x31x13 inches                                      | 23.5 x 23.5 x 9 inches                |
| Weight (lbs)  | 59 lbs   | 33 lbs   | 28 lbs                                |
| Air Inlets  | 2 x 8 inches   | 8" round on top or 3"x16" in back                    | Louvers                               |
| Air Outlets   | 2 x 8 inches   | 8" round on bottom or 3"x16" in back                 | Louvers                               |
| Power   | 120 v with plug, 360 Watts, 60 Hz                        | 120 v with plug, 200 Watts, 60 Hz                    | 110 v, 26 Watts hardware              |
| Airflow - Free  | 1750 cfm   | Two speed 200/300 cfm                                |                                       |
| Airflow Under-Load                                    | 1000 CFM+  | 151 cfm/218 cfm                                      | 85 cfm                                |
| Safety Auto Cut-Off                                   | Yes  | Yes  | Yes                                   |
| Filter Type   | (2) 1" pre-filters, (1) 4" 95 ASHRAE or (1) 4" true HEPA | (1) pre-filter, (1) true HEPA                        | Polypropylene inlet filter            |
| UV Lamp type  | Proprietary 19mm Mercury Vapor Quartz                    | Proprietary High Intensity 19mm Mercury Vapor Quartz | Proprietary 19mm Mercury Vapor Quartz |
| UV Wavelength   | UVC 254nm / UVV 187nm                                    | UVC 254nm / UVV 187nm                                | UVC 254nm / UVV 187nm                 |
| UV Lamp Configuration                                 | J Shaped   | J Shaped   | J Shaped                              |
| UV Lamp length (in)                                   | 16 inches  | 10.5 inches  | 6.5 inches                            |
| UV arc length (in)                                    | 30 inches  | 17.7 inches  | 10.5 inches                           |
| Internal Lumina Lamp coating to prevent solarization  | Yes  | Yes  | Yes                                   |
| Reaction Chamber                                      | 16x16 Aluminum Box                                       | Aluminum Reflector Box                               | Aluminum Reflector Box                |
| Average Microwatt intensity inside aluminum reflector | 8,740  | 16,479   | 10,007                                |
| Lamp Change Out Time                                  | 17000 Hours  | 17000 Hours  | 17000 Hours                           |
| Lamp Warranty   | 12000 Hours  | 12000 Hours  | 12000 Hours                           |
| Purifier Warranty                                     | 3 Years Ballast, 5 years other                           | 3 Years Ballast, 5 years other                       | 3 Years Ballast, 5 years other        |
| Construction  | Steel/Powder Coat Paint                                  | Steel/Powder Coat Paint                              | Steel/Powder Coat Paint               |
| Installation  | Stand-Alone or Ducted                                    | Stand-Alone or Ducted                                | Recessed Ceiling Lay-In               |
| Options   | VOC option, Clean Room option                            | Louvers, Fume Collector, Inlet Cap                   | 110 cfm fan                           |

|  | <b>CoilClean IL (12"/18"/24"/30"/40"/50"/60")</b>  | <b>CoilClean RT (24"/30"/40")</b>   |
|--|--|---|
| Purifying Capacity                                   | Sized according to Coil size   | Sized according to Coil size  |
| Dimensions (in)                                      | Reflector Height: 2.5"<br>Reflector Depth: 1.26"<br>Reflector Length up to 61.5" depending on IL model | NEMA 4X enclosure:<br>8x8x4<br>Reflector Height: 2.5" Reflector Depth: 1.26" Reflector Length up to 41.5" depending on RT model |
| Weight (lbs)   | 2.5 -14 lbs. depending on IL model   | RT24: 12 lbs.<br>RT30: 12.5 lbs.<br>RT40: 13 lbs.   |
| Power  | 110/220 v 50-60 Hz   | 120 v/220 v (120v available) 50-60 Hz   |
| Watts/amperage                                       | 420 ma – 1060 ma.<br>Up to 150 Watts depending on IL model   | Up to 100 Watts, 1A   |
| Starting   | Hardwire to Air Handler  | Hardwire to Air Handler   |
| Line Cord  | No   | No  |
| UV Lamp type   | Proprietary High Intensity 19mm Mercury Vapor Quartz   | Proprietary High Intensity 19mm Mercury Vapor Quartz  |
| UV Wavelength  | UVC 254nm  | UVC 254nm   |
| UV Lamp Configuration                                | Straight   | Straight  |
| UV Lamp length (in)                                  | 12"/18"/24"/30"/40"/50"/60"  | 24", 30", 40" available   |
| Internal Lumina Lamp coating to prevent solarization | Yes  | Yes   |
| Reflector  | Anodized Aluminum Parabolic Reflector  | Anodized Aluminum Parabolic Reflector   |
| Average Microwatt intensity at 36"                   | Example: IL 60 400µw at 1 meter.<br>Microwatts will vary depending on Lamp length                      |   |
| Lamp Change Out Time                                 | 17000 hours  | 17000 Hours   |
| Lamp Warranty  | 12000 hours  | 12000 Hours   |
| Purifier Warranty                                    | 3 Years Ballast, 5 years other   | 3 Years Ballast, 5 years other  |
| Construction   | Aluminum/Steel   | Aluminum/Steel  |
| Certifications                                       | CSA C/US, CE   | CSA C/US, CE  |
| Options  | Proprietary electronics & software to monitor each purifier via building computer maintenance          | Proprietary electronics & software to monitor each purifier via building computer maintenance                                   |

## Remote Computer Monitoring Software

The Building Software included with the UV Bio-Wall Series and available on the CoilClean Series is electronics and software that has been specifically designed by Sanuvox to monitor each UV Bio-Wall and CoilClean fixture for Lamp Operating Hours and Lamp-Out condition.

The program will accumulate hours of operation for each Lamp. When the accumulated time reaches a predetermined set time (hours of operation), the system will issue a "Caution" stating that the Lamps will have to be replaced within 1,000 operating hours. This "Caution" will be repeated every 100 hours of operation.

When the 1,000 hours has been reached, the system will issue a "Warning" stating that the Lamps have reached the end of their operating life and must be replaced. This "Warning" will be repeated every 8 hours.

After replacing the Lamps the time accumulation can be reset to zero.

The software has built in alarms that will alert the user should a Lamp or Ballast fail. Upon replacing a failed Lamp, the user has the ability to reset the time accumulation (hours of operation) to zero.

The software will keep track of each time the Lamp is replaced in a history file.





**SANUVOX**

**SPC**

**SPC Heat Pipes FZC**

P.O. Box 50816,

Dubai, UAE

Tel: +971-4-3341178

Fax: +971-4-3341179

Email: [spcoils@spcoils.ae](mailto:spcoils@spcoils.ae)