



SPC

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SANUVOX

ULTRAVIOLET AIR & OBJECT PURIFIERS

COMBATING SICK BUILDING SYNDROME
IMPROVING INDOOR AIR QUALITY

ABOUT SPC SANUVOX

The Company

S & P Coil Products Limited is a UK based specialist manufacturer and supplier of heating and cooling equipment to the public and private sector in the UK.

The Middle Eastern arm of the business started its regional operations from a small office in Dubai in 2001 and SPC now have branch offices in Abu Dhabi, Qatar, Jeddah, Riyadh, Delhi and Mumbai.

SPC continues to expand into new markets such as Australia, North Africa and those areas of Europe which can readily profit from the energy benefits of the company's product range.

We have an extensive range of products to meet the needs of our customers wherever their location, including; Heating/Cooling Coils, Fan Convectors, Ultraviolet Purifiers, Trench Heaters, Radiant Panels, Radiant Conditioning Sails, Heat Pipes and Air Curtains.

Our task is straightforward; we improve the comfort and indoor environment of those who live and work in them, whilst ensuring that our expert team is on hand to guide you through the process of specifying and acquiring your bespoke solution. The result is a range of products that are economical to run, robust and aesthetic – with all the sales and technical support that you require.

It is a winning combination, and after more than 30 years in business, we have built a worldwide network of satisfied customers.

KEY FACTS ABOUT SPC:

- Registered provider of CPDs in the UK.
- Major supplier to local government and commercial sectors.
- Free self-selection software packages.
- Regional Sales and Technical Support team.
- Free site check/survey.
- Investors In People in the UK.
- ISO 9001 in the UK and Middle East.

KEY FACTS ABOUT SANUVOX

Sanuvox Technologies Inc. is a global leader in Ultraviolet air and object purification. Established in Canada in 1995, Sanuvox hold a number of international patents and brings products and solutions for virtually any indoor air quality issue to markets around the world.

Sanuvox products have been independently tested by McGill University, Penn State University, the United States Environmental Protection Agency (EPA) and The National Homeland Security Research Center (NHSRC) against Biological Warfare Agents and bacterial and viral contaminants.



SPC SANUVOX UV AIR AND OBJECT PURIFIERS

The Science of Ultraviolet Purification

INDOOR AIR QUALITY – THE DILEMMA

The quality of indoor air can be greatly overlooked in a commercial building, because of the emphasis on insulation to combat energy loss. This results in biological and chemical concentrations continually rising within the building.

Commercial buildings face a myriad of Indoor Air Quality issues, from not bringing in enough outside air to poor air being brought in from outside, containing odours, biological contaminants and VOC off-gassing to name a few.

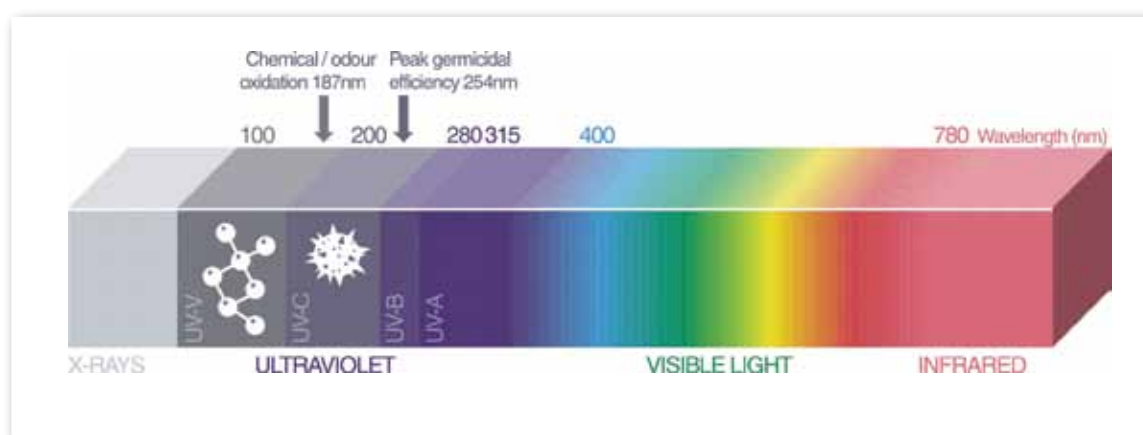
THE SCIENCE OF UV

The sun delivers specific UV wavelengths that destroy and deactivate biological and chemical contaminants that are in the atmosphere. SPC Sanuvox proprietary Ultraviolet lamps produce the same UV wavelengths as the sun. UVC (germicidal 254 nm) and UVV (oxidising 187 nm) wavelengths are produced using pure fused quartz glass that are combined into one single UV lamp/emitter.

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

UVV is used for oxidation; this is the portion of the lamp that reduces chemicals and odours, such as cigarette smoke, VOCs, diesel fumes and formaldehyde, amongst others. Both UV wavelengths work together to destroy thousands of biological contaminants and reduce chemical contaminants that continually circulate within the building.

Depending on the application, SPC Sanuvox will use UVC, UVV, or a combination of both wavelengths to achieve the desired results.



SPC SANUVOX UV AIR AND OBJECT PURIFIERS

The Benefits

THE BENEFITS

- Alleviate Sick Building Syndrome & building related illness.
- Reduce absenteeism.
- Improve productivity.
- Reduce costs, maximise energy efficiencies.
- A green building technology.
- Destroy biological odours and reduce chemicals.
- Bio-Protection.
- Dramatically reduces HVAC maintenance costs.
- Extend food shelf life.
- A healthier indoor environment.
- Reduces system pressure drop.

WHY IS SPC SANUVOX UNIQUE?

SPC Sanuvox has designed, engineered and patented UV systems for different applications. For airstream disinfection, the air velocities will be moving at hundreds or even thousands of feet per minute. The UV system (Figure A.) only has a fraction of a second (milliseconds) to bombard the moving contaminant with UV energy. In contrast, keeping a coil clean by preventing and destroying mould on the coil (Figure B.) is very different from airstream purification, because the coil as well as the UV system is stationary. The UV system has minutes, hours, days and even months to bask the coil with UV energy, not milliseconds.

This is why SPC Sanuvox designed and patented two different types of UV systems; UV Air Purification and UV Coil Cleaning. Every bio-contaminant requires a specific dose of UV microwatt energy for destruction. Typically, a virus and a spore will be much more resistant to UV energy than a bacteria, and consequently they require a longer exposure time to UV energy in order to achieve the desired destruction rate.

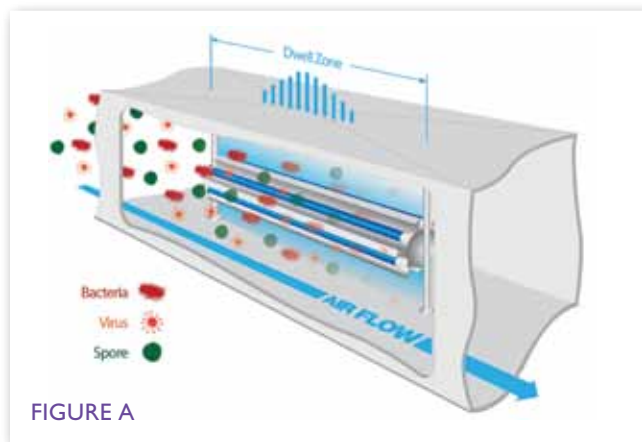


FIGURE A

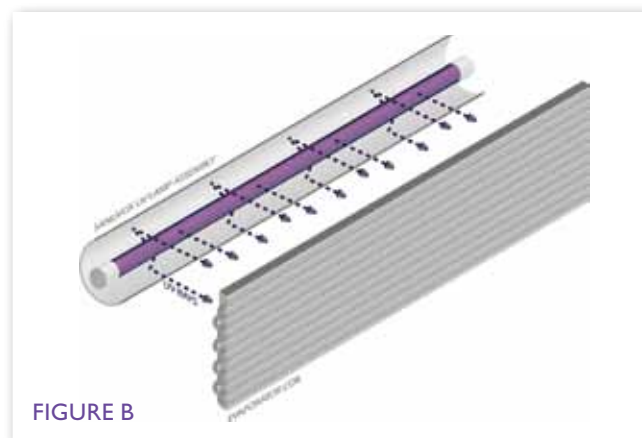
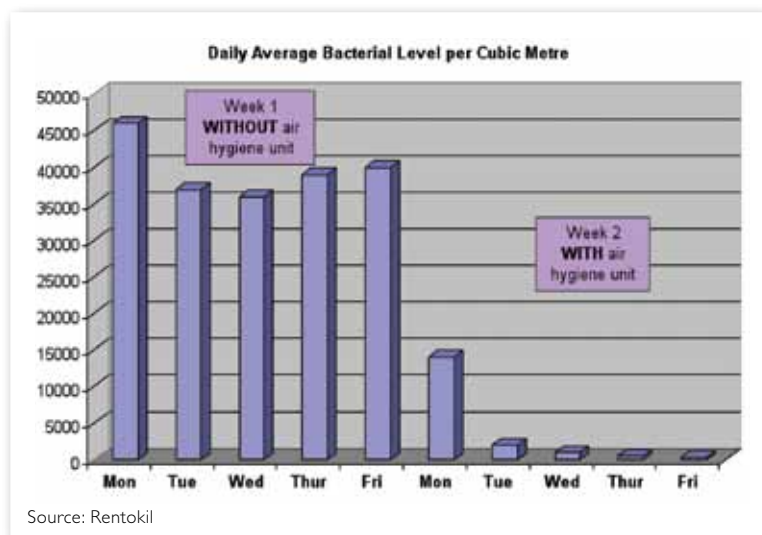


FIGURE B

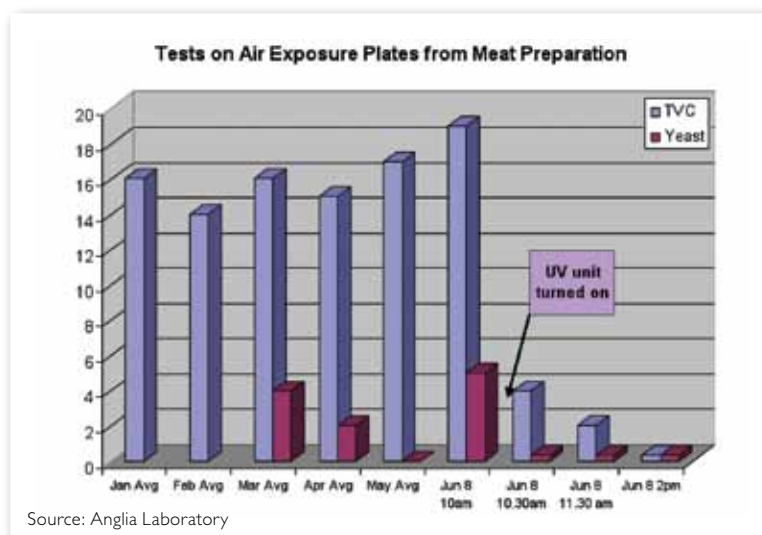
SPC SANUVOX UV AIR AND OBJECT PURIFIERS

Testing

TESTS PERFORMED ON UV AIR SANITISER IN MEDICAL TREATMENT ROOM (MAFF)



Source: Rentokil



Source: Anglia Laboratory

Tests show that bacterial loading is dramatically reduced in a short time after UV sanitisation is introduced in test situations.

Effectiveness will depend on human/animal traffic in a room and other factors that affect the introduction and type of contamination.

Surface contamination is a major concern for many people. Much of the surface contamination is delivered by the HVAC system.

Effectiveness tests using UV technology in the graph were performed using open air exposure plates – in reality a test of surface contamination.

Dramatic reduction on surface bio-contaminants can be observed in a matter of hours. Applications include food preparation, healthcare, pharmaceutical, offices, schools, homeless shelters, military installations and hospitals.

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

What do you want to treat?

WHAT DO YOU WANT TO TREAT? THE AIR OR THE A/C COIL?

SPC Sanuvox divide their commercial products into 2 categories:

- a) UV Object Purification (HVAC coil, walls, etc)
- b) UV Air Purification

SPC Sanuvox UV Object Purifiers named appropriately the “CoilClean series”, are high-intensity 19mm UVC (germicidal 254nm) quartz lamps mounted into anodised aluminium parabolic reflectors. These systems are designed to irradiate stationary objects (usually an A/C COIL) with UVC light preventing and destroying mould 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 concerns outside of the object that is being treated. UV CoilCleaners will have little effect on the air moving in the duct. By treating the air in the duct with UV Air Purifiers (see UV Air Purifiers) they will also have an effect in keeping the coils cleaner by reducing the biological contaminants in the air.

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

SPC Sanuvox UV Air Purifiers use proprietary dual zone (UVC 187nm and UVC 254nm) high-intensity or UVC (254nm) high-intensity 19mm quartz lamps to destroy biological and chemicals in the air.

INDOOR AIR QUALITY – TECHNOLOGIES

POLLUTANT TYPE	EXAMPLES	REMEDIATION TECHNOLOGY
Solids	Dust	Filters
Chemicals	Solvents Formaldehyde VOC	Absorption on activated charcoal Thermal oxidation UV-Photo-oxidation
Biological	Fungi Moulds Bacteria	Germicidal chemical products UV Sterilisation DNA

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

SPC Sanuvox Ultraviolet Lamp Technology

STRAIGHT LAMP



SPC Sanuvox Ultraviolet lamps are available in a wide range of proprietary designs and UV wavelengths. SPC 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) oxidising wavelengths designed to destroy biological & reduce chemical contaminants. Single zone UVV oxidising lamps are also available for specific applications.

Each SPC Sanuvox lamp is manufactured to meet strict quality control and efficiency guidelines and are tested before they leave the factory.

SPC Sanuvox Ultraviolet lamps are unquestionably the highest quality UV lamps available. SPC Sanuvox incorporates the very latest in UV Lamp technologies, guaranteeing longest lamp life, low mercury content, with features such as anti-solarisation 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 millimetre dual zone UVC germicidal 254nm & UVV oxidising 187nm lamp.
- 2 Internal Alumina Coating: Prevents solarisation of the lamp & increases stability and efficiency.
- 3 Proprietary "J" Shape lamp effectively takes the place of two lamps.
- 4 Proprietary mercury vapour gas mixture 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

SPC 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.

All power supplies are C E compliant.

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

The Importance of Reflection

All patented SPC Sanuvox Ultraviolet Air Purifiers and CoilCleaners use aluminium reflectors to direct the UV energy where needed most. Certain SPC Sanuvox systems use an aluminium reflecting tube which contains the UV energy making for a concentrated dose of UV, while SPC Sanuvox UV CoilCleaners use parabolic aluminium reflectors to direct the UV energy.

The use of aluminium reflectors is an integral part of SPC Sanuvox proprietary systems. By using reflectors, SPC Sanuvox is able to maximise virtually all the UV energy, either by concentrating or directing the UV energy.

A flashlight or the headlight of a car uses a reflector to direct the light where needed most. UV energy is no different; a reflector is needed to maximise UV efficiency and intensity.

Aluminium is used because it has one of the highest co-efficient of reflectance at >85%.

BENEFITS OF REFLECTION

- Directs 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 and rubber 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 anodised aluminium parabolic reflectors to project the UV energy outwards from the centre 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 mould 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 SPC Sanuvox In-Duct UV Air Purifiers use an aluminium reflecting tube which houses the UV lamp, making for a concentrated self cleaning dosage of UV energy (**example 3**).



REFLECTING PATTERN



EXAMPLE 1



EXAMPLE 2



EXAMPLE 3

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

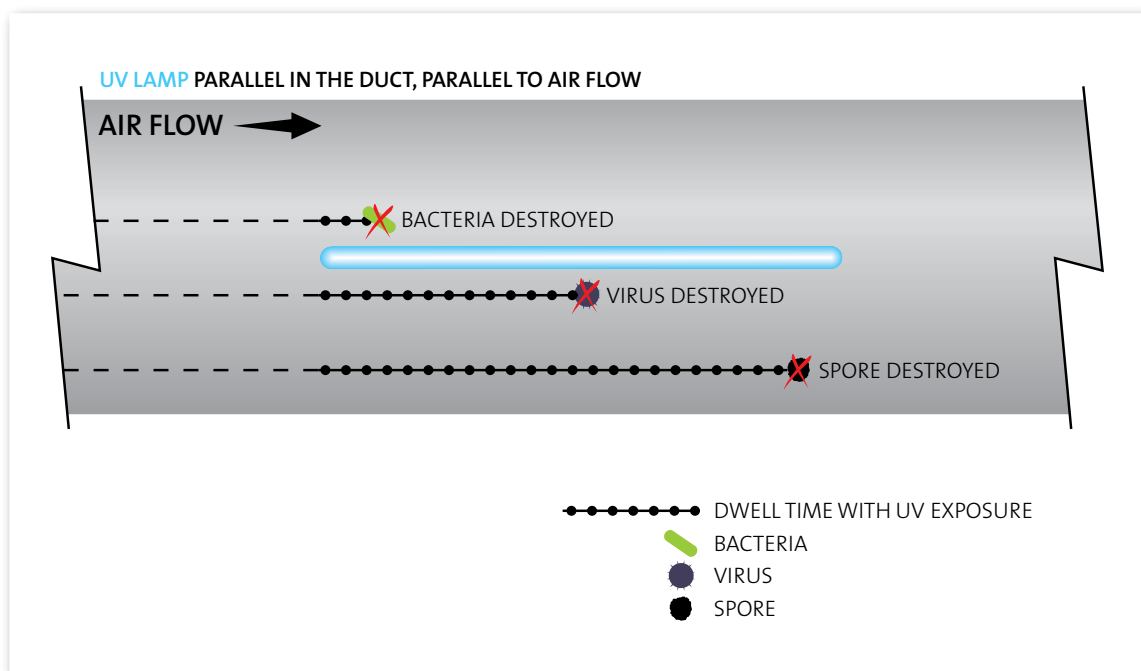
The Importance of Parallel Installation

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 (μW) to be destroyed. Typically, bacteria are the weakest contaminants, requiring the least amount of UV 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 5 times the amount of UV energy compared to a virus.

Research on SPC 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 and reduces pressure drop. The parallel lamp orientation provides the best overall performance and efficiency.

SPC Sanuvox proprietary Ultraviolet lamps produce two UV wavelengths. UVC (germicidal 254nm) and UVV (oxidising 187nm) pure fused quartz glass that are combined into one single UV lamp/emitter.



SPC SANUVOX UV AIR AND OBJECT PURIFIERS

In-Duct Ultraviolet Air Purifiers

UV BIO-WALL COMMERCIAL

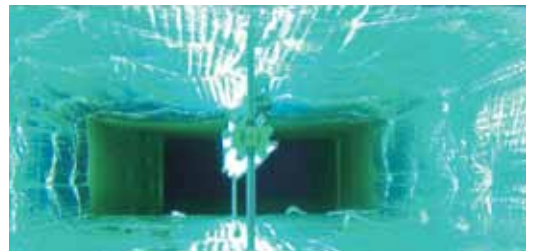
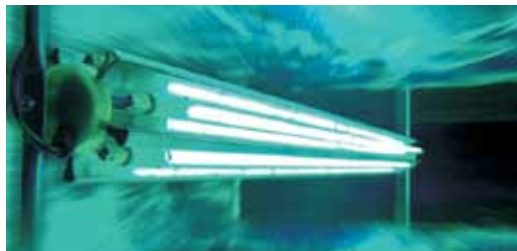
In-Duct UV Air Sterilisation System

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

Each Bio-Wall uses 5 high intensity 19mm pure fused UVC quartz lamps, which are mounted into anodised aluminium parabolic reflectors that reflect the full 360° of germicidal radiation. The Bio-Wall is mounted parallel to the airstream in order to maximise the contaminants 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 and “lamp out” alarms. Volt free contacts allow for building automation integration.

The number and length (lamps 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 of the contaminants.



FEATURES

- Reduce airborne infection rates, building related illnesses, workplace absenteeism while dramatically improving Indoor Air Quality.
- Continuously treats the entire duct.
- Destroys up to 99.9999% of bio-chemical contaminants.
- SPC Sanuvox provides detailed real-time kill rates & sizing calculations.
- Tested by the US EPA and National Homeland Security to destroy >99.9% of bio-contaminants on a single pass.
- Available in 40”, 50” and 60” lengths.
- 5 high-intensity pure fused 19mm. Quartz UVC lamps.
- Anodised aluminium parabolic reflectors maximises UV energy.
- Digital Timer, LED & audible alarm on ballast control panel.
- Available with volt free contacts.
- Warranty: 15 years ballast; 2 Years UV lamp.
- CSA C/US certified and C E compliant.

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

In-Duct Ultraviolet Air Purifiers



QUATTRO LIGHT COMMERCIAL

(can be supplied pre-fitted to appropriate ductwork at extra cost on request)

In-Duct UV Air Sterilisation System

Inspired by the overwhelming success of the Commercial UV Bio-Wall, the QUATTRO is designed as a light Commercial In-Duct UV Air Purifier. The QUATTRO can treat the entire duct at one time, destroying up to 99.9% of the biological and chemical contaminants in the air-stream.

The Quattro includes three 18" high-intensity pure fused quartz UVC germicidal lamps and one 18" high-intensity pure fused quartz UVC / UVV lamp, which are attached to four anodised aluminium parabolic reflectors and are mounted parallel to the air-stream.

Adjustable mounting brackets permit the lamps and reflectors to be extended up to 15" from the duct wall so the assembly can be positioned in the centre of the duct-work, creating a wall of germicidal UV energy up to 30" deep.

FEATURES

- Commercial In-Duct UV Air Purifier.
- Treats the entire duct at one time.
- Destroys up to 99.9% of biological contaminants at one time.
- Reduces chemicals & destroys biological odours.
- Installed PARALLEL to the air-stream results in greater 'dwell time' between the air & the UV lamps.
- 1,600 microwatts per/cm² of UV intensity @ 36".
- Four 18" high intensity pure fused quartz lamps.
- Four anodised parabolic reflectors intensify & maximise 360° of UV energy.
- Pressure Sensor turns purifier on & off. Simple installation, just 'plug & play'.
- LED 'smart system' status visual display.
- Four high-output electronic rapid-start ballasts.
- Adjustable clutch allows for reflectors & lamps to easily extend up to 15" to the centre of the duct.
- Patented design & SPC Sanuvox quality.
- Recommended lamp change after 2 years.
- CSA C/US certified & C E compliant.

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

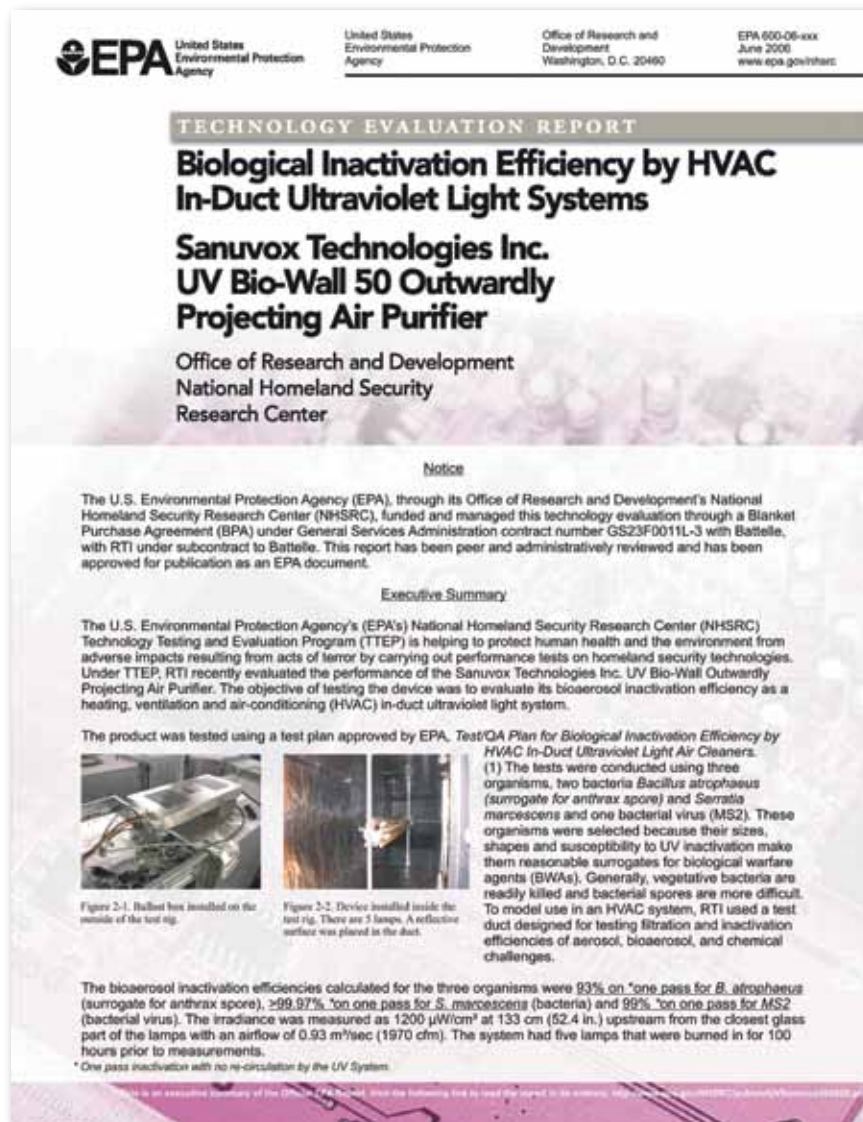
In-Duct Ultraviolet Air Purifiers

TESTING – AIR CLEAN

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).



SPC SANUVOX UV AIR AND OBJECT PURIFIERS

Stand Alone and or Ducted Models



UV AIR STERILISER

Bio Grid 600

The Bio Grid 600 unit is designed for easy installation in a standard 600 x 600mm ceiling grid.

This unit is designed to slow the air over the UV lamp and uses an aluminium reflective housing to intensify the UV energy. This will effectively reduce chemical contaminants and odours and destroy the biological contaminants that affect the indoor environment. The unit utilises a quiet and energy efficient E.C. motor/fan assembly.

The ability to treat an area of up to 500 sq ft per unit makes this the ideal solution for the problems associated with sick building syndrome.

FEATURES

- Destroys biological contaminants such as mould, bacteria, viruses, germs, allergens.
- Reduces chemicals & destroys biological odours.
- 10,000 microwatts per/cm² of UV intensity inside UV reflecting box.
- Patented 19 mm. Pure fused quartz UVC/UVV lamp.
- Reflecting box maximises UV intensity.
- High-output ballast.
- Patented Design & SPC Sanuvox quality.
- 2 year warranty.
- Integral E C Motor/Fan.
- CSA / US certified & C E compliant.

IDEAL FOR

- Ideal for offices, receptions, doctor's offices, waiting rooms, schools, daycare centres, etc.

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

Stand Alone and or Ducted Models



S300FX-GX

HEPA / UV Sterilisation

The S300FX-GX is designed for applications that require filtration as well as purification. The included HEPA filter is 99.97% effective, trapping particles down to 0.3 microns in size.

Purification is done through germicidal photo-oxidation. The air is pulled into the aluminium UV reaction chamber where the air is made to pass parallel to the UV lamp, bombarding it with UVC & UVV light, destroying the biological & reducing chemical contaminants in the air. The air continues to pass through the pre-filter and finally the HEPA filter.

By combining HEPA filtration & UV purification, SPC Sanuvox is able to offer a complete Indoor Air Quality solution in one unit.

FEATURES

- 2" pre-filter & True 2.5" HEPA filter captures particles down to 0.3 microns in size.
- Eradicates biological contaminants such as mould, bacteria, viruses, germs & allergens.
- Reduces chemicals & destroys biological odours.
- 200 / 300 cfm. 2 speed blower.
- Patented 19mm high-intensity quartz UVC/UVV 'J' lamp (18" arc length).
- Aluminium reaction chamber maximises UV intensity.
- Patented design & SPC Sanuvox quality.
- 2 year warranty.
- CSA C/US certified and C E compliant.

EASILY USED AS

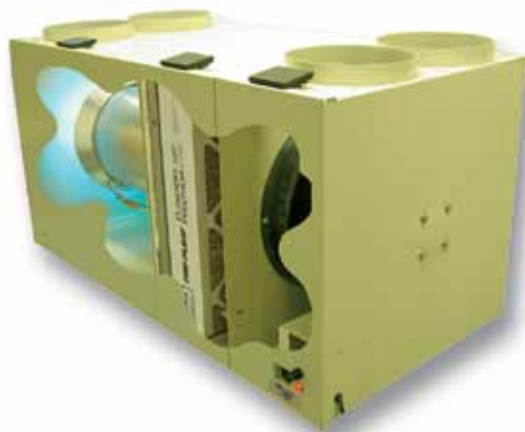
- A Stand-Alone UV HEPA system (as shown above).
- Mounted to the HVAC system (with inlet/outlet knock-outs on the back).
- Remotely mounted collar in/out (with two 8" inlet/outlet collars).

IDEAL FOR

- HVAC by-pass for whole home filtration / purification or Stand-alone wall mounting.
- Smoking rooms, hotels, commercial buildings, laboratories, nail salons, doctor's office, hospital patient rooms, dentist offices, etc.

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

Stand Alone and or Ducted Models



S1000FX-GX

Filter / UV Sterilisation

The S1000FX is a combination Ultraviolet - filter air purifier. The S1000FX can be used in applications including hospital clean room biological treatment, smoking environments and garbage room odour treatment to name a few.

In addition to the patented SPC Sanuvox UV process, the S1000FX clean room option is equipped with UV "J" lamps (one germicidal UVC lamp and one germicidal / oxidising UVC / UVV Lamp) for complete biological protection and chemical reduction. 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 0.3 microns (1 / 75000 of an inch) in size.

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

FEATURES

- Destroys biological contaminants such as mould, bacteria, viruses, germs, allergens.
- Reduces chemicals & destroys biological odours.
- Stand-alone installation or can be ducted to multiple rooms.
- Two 1" pre-filters & one 4" 95% ASHRAE pleated filter.
- "Clean Room Option" includes HEPA filter to capture particles down to 0.3 micron in size & additional UVC "J" lamp.
- 1750 cfm blower. Under load with filters, 1000 cfm.
- Patented 19mm pure fused quartz UVC/UVV "J" lamp.
- Aluminium reaction chamber maximises UV intensity.
- High-output ballast.
- Patented design & SPC Sanuvox quality.
- 2 year warranty.
- C E compliant.

IDEAL FOR

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

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

Stand Alone and or Ducted Models



PENTA

Mobile UV Sterilisation

There are instances in both hospital and commercial applications where room sterilisation is required.

A hospital may need to irradiate an empty room, a room with a hospital bed in it, a bathroom, etc to ensure that MRSA and C. difficile are not present.

In a commercial application, for example a cheese manufacturer, it may be necessary to irradiate the room where different types of cheese are made to prevent cross contamination.

The Penta – Dual is unique in providing a five log [99.999%] kill on MRSA and C. difficile in under 15 minutes in a hospital room that contains a hospital bed. This 15 minute time frame is to ensure that the five log reduction on MRSA and C. difficile is applicable to both sides of the handrails of the bed as well as the walls etc of the room.

FEATURES

- Able to provide greater than a 5 log reduction on C. difficile and MRSA in under 15 minutes.
- 5-60 inch High Intensity quartz UVC lamps for the Master unit.
- 5-40 inch High Intensity quartz UVC lamps for the Slave unit.
- Small footprint.
- Single carrier for both the Master and Slave units.
- Lamps protected during transport without the use of a removable cover.
- Motion detector on both units for emergency shut-off should anyone enter the room while the purifier is operational.
- Programmable shut-off time.
- LED indicators for “Cycle Completed” and “Cycle Interrupted”.

IDEAL FOR

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

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

Stand Alone and or Ducted Models



P900GX

Portable UV Sterilisation

The P900GX has all the benefits of the SPC Sanuvox patented system in a portable air purifier weighing only 11 lbs. The variable speed blower of the P900GX moves the air into the reflective aluminium reaction chamber so that the air travels parallel to the UV lamp. The dual zone UVC/UVV (germicidal / oxidising) lamp destroys the biological contaminants and reduces the chemical contaminants.

The P900GX can be used continuously, or when the need arises. Easily transported and including 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.

FEATURES

- Eradicates bacteria, viruses and mould.
- Reduces chemicals & destroys biological odours.
- SPC Sanuvox's patented system in a portable UV Air Purifier weighing 11 lbs.
- Patented 19mm high-intensity quartz UVC/UVV 'J' lamp.
- 9 electronically controlled speeds.
- Touch-pad digital controls with count-down timer.
- An effective air purifier where there is no forced air system.
- Purify up to 900 square feet.
- Easily wall mountable. Stand and handle included.
- 2 year warranty on parts including UV lamp.
- CSA C/US certified & C E compliant.

IDEAL FOR

- Homes, apartments, waiting rooms, classrooms, offices, hotel rooms, fire restoration and any application that would require spot biological & chemical purification.

NOTE

- All UVV oxidising lamps (187nm) must be used in unoccupied spaces for concentrated chemical & odour applications. Applications include: fire restoration, car dealerships, waste rooms, etc.

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

UV Object Purifiers For Mould & Bacteria on Evaporator Coils



UV COILCLEAN COMMERCIAL

Coil Cleaner

The patented SPC Sanuvox CoilClean IL UV Systems (available up to 60" lamp length) are designed to prevent and destroy mould and other microbial growth from growing on the evaporator coil and surrounding areas. The benefits include eliminating biological "blow-off" of bacteria, viruses, spores and odours into the building while maintaining a clean coil eliminating the need for conventional coil cleaning. Typically, bio-film coats the coil reducing heat transfer and coil efficiency. The CoilClean IL maintains a clean coil maximising system performance enabling the coil to work at optimum efficiency saving energy.

Equipped with High-Intensity 19 mm. Quartz UVC Lamps and High-Output Electronic Ballasts paired to anodised aluminium parabolic reflectors.

By using anodised aluminium parabolic reflectors, SPC Sanuvox UV CoilClean Purifiers are able to direct virtually all the UV energy onto the coil without losing UV on the back, top and bottom of the UV lamp. The reflector also protects plastics and wiring from destructive UV rays. The CoilClean parabolic reflector maximises UV energy much the same way a flashlight or a car's headlight uses a reflector to direct the UV energy where it is needed most, in this case the HVAC coil. Using any other UV lamp / emitter will result in losing more than half the UV energy.

FEATURES

- Destroys mould and other microbial growth on the evaporator coil as well as biological odours.
- Improves energy savings & reduces coil maintenance.
- Available in sizes up to 60" lamp length.
- High-Intensity 19mm. UVC quartz lamp.
- SPC Sanuvox provides detailed real-time kill rates & sizing calculations.
- Patented UV system maximises UV efficiency, while protecting plastics from destructive UV rays.
- University tested & published results in The Lancet Medical Journal.
- Higher UV intensity & reliability than other UV lamp / emitters (ballast on the outside of the AHU).
- 15 year warranty for the ballast and 2 year warranty for the UV lamp.

TESTING – COIL CLEAN

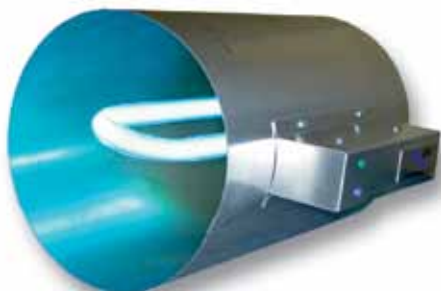
Sick Building Syndrome

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%.

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

Speciality Ultraviolet Products

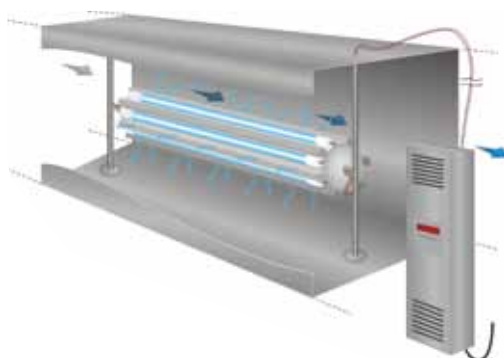


ODOUR-HRV

Commercial Odour & Chemical Exhaust Option

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

* Multiple units can work in series and/or parallel for any size exhaust. Custom applications available.



UV BIO-WALL

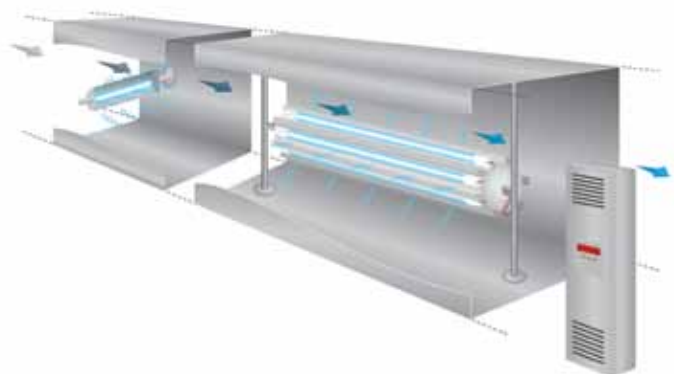
Standard In-Duct Air Quality Installation

This installation uses the standard UV Bio-Wall. Designed for "all-around" chemical & odour 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 oxidising glass may be used to reduce chemical contaminants and odours. 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 DUO SYSTEM

Elevated Chemical & Odour Option

If the application requires a higher level of odour/chemical control, "multi-split" fixture(s) are installed upstream of the UV Bio-Wall(s). This 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 odours will be reduced. Oxidation is used to reduce 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 convert the residual ozone. In addition to converting the residual ozone, the UV Bio-Wall will also destroy the biological contaminants in the air.



SPC SANUVOX UV AIR AND OBJECT PURIFIERS

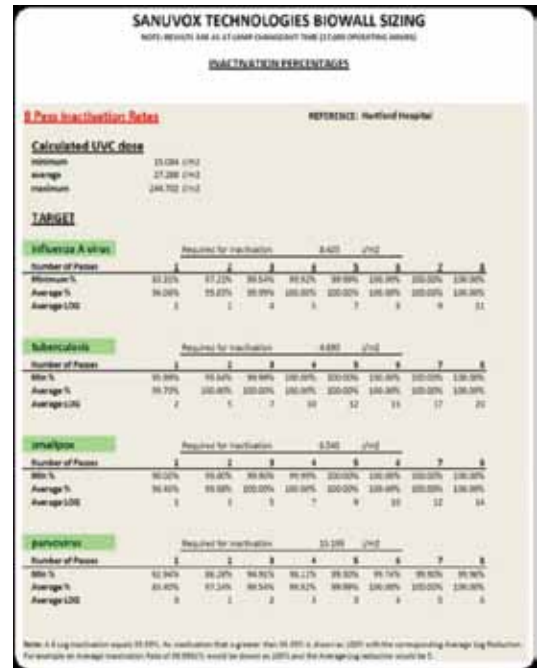
Selection Software

Selection Software is available for both CoilClean and AirClean applications.

An example of both can be seen below.

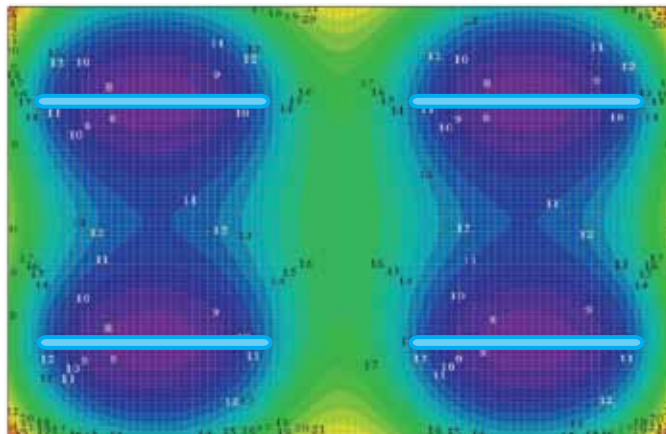
AIR CLEAN

The sizing programme will select the system to use and lamp length, and will give a breakdown of kill rates on various Bio-Contaminants.



COIL CLEAN

In this example, the UV CoilClean Selection software 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 Selection Software and provided in a user friendly PDF report.



Aspergillus Niger



Note: Complete destruction is considered to be Aspergillus Niger treated to 99.99% inactivation.

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

Applications and Solutions for UV Purification

1 PUBLIC AREAS



2 MEDICAL APPLICATIONS



3 MUSEUMS



4 RUBBISH ROOMS



5 EDUCATIONAL FACILITIES



6 PRODUCE STORAGE



7 FOOD PROCESSING



8 OFFICES



9 PRISONS



10 HOSPITALITY INDUSTRY



SPC SANUVOX UV AIR AND OBJECT PURIFIERS

BioWall Specifications

OUTWARDLY PROJECTING 5 LAMP CYLINDRICAL ARRAY UVC IN-DUCT AIR IRRADIATION SPECIFICATIONS

PART 1 GENERAL

- 1.1 Equipment to be CSA/UL/or ETL certified.
- 1.2 Each Cylindrical Array will be packaged with a plan for the installation as well as the manufacturer's calculation sizing chart for the installation.

PART 2 – PRODUCT

- 2.1 SANUVOX BioWall Air Steriliser or equivalent.
- 2.2 To provide an individual Cylindrical Array that will effectively create a barrier wall of germicidal UV energy that will treat 100% of the air that passes through it.
- 2.3 The Cylindrical Array will consist of five (5) outwardly projecting UV lamps to be used in an air duct supporting a longitudinal (parallel) airflow.
- 2.4 To maximise the UV irradiation directed to the air, each UVC lamp will be mounted to a parabolic reflector made of aluminium, reflecting at least 90% of the UVC (254 nm) energy, optimising the output UVC of the lamp.
- 2.5 The aluminium parabolic reflector will be built from an aluminium extrusion aerodynamically shaped to be capable of withstanding air velocities up to 1000 ft/min. without wobble, vibration or whistle noise.
- 2.6 The overall diameter of the Cylindrical Array will not exceed 18.4cm. (4.25 inches).
- 2.7 An aluminium convex deflector element mounted to the support, so that the airflow is directed over the Cylindrical Array.
- 2.8 The cone diameter of the convex deflector shall not exceed 8.75cm. (3.5 inches).
- 2.9 The portion of the wire set connecting the Cylindrical Array to the ballast box that is mounted inside the duct shall be constructed of 18Awg, ULI716 Teflon wire.
- 2.10 The aluminium ballast box shall consist of one ballast for each lamp; a resettable hour accumulating counter that will display the accumulated hours for each lamp; an LED "Lamp On" indicator for each lamp; an audible buzzer to indicate a "Lamp Out" condition; a volt free contact to connect to the BMS; and a second volt free contact to be able to remotely turn the Cylindrical Array on and off.

PART 3 – ELECTRICAL

- 3.1 The power source will be an electronic type, rapid start with a power factor greater than 0.95 and an energy conversion of at least 75%.
- 3.2 The power source shall be available in 120 V, 230V AC 50-60 Hz. and be able to operate reliably in indoor environments ranging from – 30F (-20C) to 158F (70C) temperature, with relative humidity up to 100%.

PART 4 – INSTALLATION

- 4.1 The one piece anodised aluminium Cylindrical Array will contain a plurality of five (5) reflectors, having a generally parabolic inner surface and a UV lamp mounted to each reflector so that the generally parabolic inner surface reflects all the UV radiation emitted by the UV lamps in a radial direction.
- 4.2 The Cylindrical Array can be positioned in either the return duct or the supply duct of the AHU.
- 4.3 In order to guarantee the adequate inactivation performance for a given AHU, the vendor shall specify in detail, a manufacturer approved layout of the number of Cylindrical Array's required and their respective position.
- 4.4 The inside of the duct where the Cylindrical Array will be installed must be lined with aluminium to reflect the UV intensity created by the Cylindrical Array back into the duct. The aluminium lining must have a minimum coefficient of reflection of 85%.
- 4.5 Safety interlock switches are to be installed on all access doors where UV intensity may be present. Manufacturer to provide CAUTION LABELS to be installed on these access doors.

PART 5 – UV LAMP

- 5.1. The High Intensity UVC lamp will be of the low-pressure (3.0 Torr) mercury laden argon-neon type internally coated to reduce solarisation.
- 5.2. The UVC lamp is a pure fused quartz type 219 shell, properly doped with Titanium Oxide in order to filter out 99.99% of the 185 nm. wavelength to avoid the production of ozone.
- 5.3. Depending on lamp lengths of the Cylindrical Array, the UV net output will be at least 1350 microwatts/cm² measured at 1 meter (after Burn-In time) in the 245 nm to 266 nm. band, while operating at nominal temperature in an air stream moving at 400 fpm.
- 5.4. The UVC lamp design will be based on a Single Ended, Circuline 4-pin type connection, hot cathode, T-6 diameter (19 mm).

PART 6 – PERFORMANCE

- 6.1. Performance of the Cylindrical Array is defined as the ability to irradiate an organism (customer specified) listed in the manufacturer approved computer simulation, to the specified irradiation percentage for either the single pass or a multiple pass application (customer specified) that is part of the computer simulation, after 17,000 hours of operation.

PART 7 – WARRANTY

- 7.1. The power source will carry a 15-year ballast warranty.
- 7.2. The high intensity UVC lamp will be guaranteed for 17,000 hours.
- 7.3 The control electronics will carry a 3-year warranty.

11. **Approved Manufacturers:**
- SPC Sanuvox or equivalent.

SPC SANUVOX UV AIR AND OBJECT PURIFIERS

Coil Mounted UVC Irradiation Specifications

COIL MOUNTED UVC IRRADIATION SPECIFICATIONS

PART 1 – GENERAL

- 1.1 Equipment to be CSA/UL/or ETL certified.
- 1.2 Each AHU, will be packaged with a plan for the installation of the lamp assemblies as supplied by the manufacturer's calculation chart, indicating the orientation (upstream, downstream, or both sides of the coil) of the installation.

PART 2 – PRODUCT

- 2.1 SANUVOX IL Coil Clean Object Steriliser equivalent.
- 2.2 To effectively irradiate the HVAC coil surface and maximise the UV irradiation onto the coil, each UVC lamp will be mounted to a parabolic reflector made of aluminium, reflecting at least 90% of the UVC(254 nm)energy, optimising the output UVC of the lamp.
- 2.3 The aluminium parabolic reflector will be built from an aluminium extrusion aerodynamically shaped to be capable of withstanding air velocities up to 1000 ft/min. without wobble, vibration or whistle noise.
- 2.4 The ballast will be mounted in an adequate aluminium enclosure that will enable it to be mounted on a rigid surface outside of the AHU, protecting the power source from moisture and humidity.

PART 3 – ELECTRICAL

- 3.1 The power source will be an electronic type, rapid start with a power factor greater than 0.95 and an energy conversion of at least 75%.
- 3.2 The power source shall be available in 120 V, 230V AC 50-60 Hz. and be able to operate reliably in indoor environments ranging from 45F (8C) to 170F (86C) temperature, with relative humidity up to 100%.

PART 4 – INSTALLATION

- 4.1 Each UVC source will be clamp-mounted for easy installation, positioning and maintenance onto standard ¾-inch (1.87 cm) electrical conduit or aluminium tubing, supplied by the vendor or field supplied and installed as a permanent support structure. The support structure will be adequately fixed with non-corrosive hardware so that the UVC source does not vibrate or loosen.
- 4.3 The UVC source may be installed either upstream, downstream, or on both sides of the coil depending on the recommendation of the manufacturer.
- 4.4 In order to guarantee the adequate performance for a given coil, the vendor shall specify in detail, a manufacturer approved layout of the number of UVC sources required and their respective position (distance from the coil, alignment on the coil as well as on which side of the coil the UV source is to be installed).
- 4.5 Safety interlock switches are to be installed on all access doors where UV intensity may be present. Manufacturer to provide CAUTION LABELS to be installed on these access doors.

PART 5 – UV LAMP

- 5.1. The High Intensity UVC lamp will be of the low-pressure (3.0 Torr) mercury laden argon-neon type internally coated to reduce solarisation.
- 5.2. The UVC lamp is a pure fused quartz type 219 shell, properly doped with Titanium Oxide in order to filter out 99.99% of the 185 nm. wavelength to avoid the production of ozone.
- 5.3. The UVC source net output will be at least 350 microwatts/cm² measured at 1 meter (after Burn-In time) in the 245 nm to 266 nm.band while operating at nominal temperature in an air stream moving at 400 fpm.
- 5.4. The UVC lamp design will be based on a Single Ended, Circuline 4-pin type connection, hot cathode, T-6 diameter (19 mm).

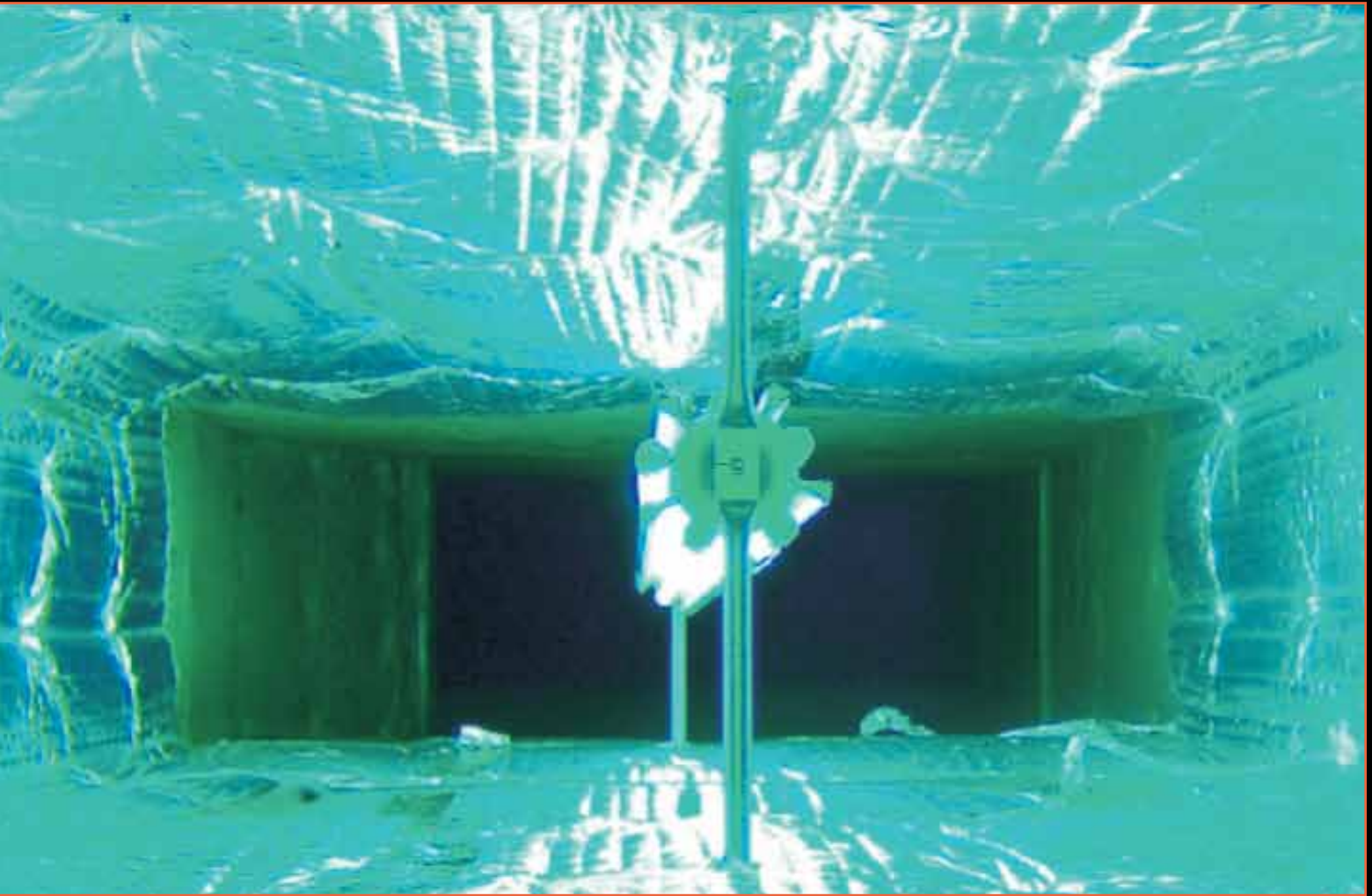
PART 6 – PERFORMANCE

- 6.1. Adequate performance is defined as the irradiation intensity required so that a microorganism requiring a lethal UV dose of 100,000 microwatts/cm² will not survive more than 60 minutes anywhere on the treated surface of the coil after 17,000 hours of operation. In order to validate the performance of the proposed arrangement, the vendor shall submit a manufacturer approved computer simulation showing the resulting microorganism kill (time map) of the treated surface of the coil after 17,000 hours of operation.

PART 7 – WARRANTY

- 7.1. The power source will carry a 15-year corrosion and performance warranty.
- 7.2. The high intensity UVC lamp will be guaranteed for 17,000 hours.

- II. **Approved Manufacturers:**
- SPC Sanuvox or equivalent.



SPC SANUVOX

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