PAS1100-P

Product Highlights

Function: Portable air system used for infection control to clean air and create negative pressure (or positive pressure) in medical facilities, or to clean and recirculate room air in isolation rooms or other high risk areas. Unit recirculates or exhausts 850 cfm (high speed) of clean and disinfected air.

Technology: HEPA Filtration and Ultraviolet Germicidal Irradiation (UVGI)

High Efficiency Particulate Air Filters (HEPA)

For over eighty years HEPA filters have been the primary mechanism used for removing airborne pathogens, microorganisms, dust, and particulate from the air at very high efficiencies. Standard certified HEPA filters are 99.97% efficient at .3 microns, meaning they are individually tested to perform at that efficiency. If a product contains a "HEPA" filter that is not certified, then in may not perform at HEPA efficiency. The HEPA filters used in the PAS1100 are all scanned and certified to perform at **99.99%** efficiency at .3 microns, and the HEPA filter is securely sealed within the cabinet to prevent air bypass around it. The PAS1100 comes standard with a HEPA filter that has a galvanized steel frame to ensure against frame disintegration or warping due to moisture.

Ultraviolet Germicidal Irradiation

UVGI has also been used as a means of destroying airborne bacteria and disease, as airborne microorganisms have been shown to be destroyed when subjected to certain levels of UV radiation. Please review the sheet showing dosage of UV-C necessary for complete destruction of various airborne pathogens. A key aspect of this is the fact that some pathogens may be too small to be trapped by a HEPA filter with 99.99% efficiency, but they are very susceptible to the effects of UV. The PAS1100 creates a UV dosage of 26,053 μW sec/cm^2 on high speed, thereby generating over twice the amount of UV dosage needed to destroy airborne TB, which is certainly enough to destroy many viruses. This is unlike other UV units on the market today, in that many systems having UV cannot create enough UV dosage to destroy airborne pathogens due to limited lamp intensity and lack of residence time.

Furthermore, the UV lamps in the PAS1100 are installed on the "dirty" (intake) side of the HEPA filter where the dust, bacteria, and microorganisms are collected. Microorganisms like mold, which are difficult for UV to destroy when because of their large size, can actually live and grow on filters (by feeding off of trapped particulate and

microorganisms on the HEPA), eventually eating through the filter media and potentially creating pinhole leaks. If this occurs over a long enough period of time, trapped microorganisms can destroy the integrity of the filter, rendering it inefficient and useless. However, because the HEPA media is constantly radiated by UV in the PAS1100, trapped molds and other microorganisms that cannot be destroyed when airborne will be effectively deactivated on the HEPA (because the UV is given a long enough residence time to deactivate the microorganism). And by having the UV constantly radiating and "cleaning" the HEPA filter; it creates a safer environment for when the filters need to be changed.

Applications:

Medical facilities in operating rooms, TB Isolation rooms, intensive care units, examination rooms, Emergency Rooms, bronchoscopy/sputum rooms, and waiting areas. Also used in laboratories (tissue culture or other high risk labs), homeless shelters, AIDS clinics, or anywhere there is a high risk of airborne bacteria and disease.

Recommended ACH: 12-15 ACH

Features/Advantages:

Negative/Positive Pressure Options

The units can be installed to create positive or negative pressure, depending on the location of the unit and exhaust air. To create a negative pressure room, (such as for a TB Isolation Room or a bronchoscopy/sputum room), the unit should be installed in the room where negative pressure is desired, and the exhaust air should be sent out of the room. To create negative pressure in a TB isolation room as per CDC guidelines, exhaust flows of at least 10% greater than supply air (but no less than 50 cfm) must occur, and all existing return air should be blocked off. For instance, a room having 300 cfm supply air must have at least 350 cfm exhaust (because you need at least 50 cfm more).

To create a positive pressure room, (such as for an operating room or immune-deficiency room), the unit should be installed outside of the room where positive pressure is desired, and the exhaust air should be sent back into the room.

Recirculation Option:

As a recirculation unit, the PAS1100-P is used to turn virtually any patient room into an Isolation Room, helping to protect health care workers from exposure to contaminated air. The most important aspect of any air cleaner is the air flow pattern created, as only air that passes through the unit can be effectively cleaned and disinfected. With the PAS1100-P, an excellent air flow pattern is created to ensure maximum effectiveness and

contaminant removal. Air is drawn into the lower end of the unit on four sides (not from the bottom, as such a design pulls dusty air from the floor which can cause premature HEPA loading), and exhausted from the upper end of the cabinet on three sides (front, left and right). This ensures excellent air mixing occurs throughout all corners of the room, preventing dead air spots from occurring on each side of the unit (as can happen when air is only exhausted in one direction). Furthermore, the height of the PAS1100-P allows for clear separation of air intake and exhaust, guarding against "short circuiting" of clean air that can occur in smaller units.

Combination UVGI/HEPA

Having both technologies provides double assurance that the air is completely clean and safe. Moreover, HEPA-only units are less efficient at removing viruses and can have problems with interior bacteria/microbial growth, while UV-only units provide no particle reduction at all.

Low Replacement Costs

UVGI not only enhances the effectiveness of the unit, but it also reduces the replacement costs, thereby increasing the overall efficiency. The most expensive replacement cost of any similar air cleaning device is the HEPA filter. In HEPA-only systems, mold and microbial growth can occur on the HEPA filter, so HEPA filters should be replaced at least once per year (even if the HEPA filter is not clogged). If they are not replaced, the microorganisms can actually eat through the HEPA media (this is known as bacteria grow-through), and ruin the integrity of the filter (and the overall air cleaning system). However, with the PAS1100, the entire HEPA filter is constantly bathed in UV light, so mold and microbial growth cannot occur. Given this and a prefilter that will take out larger dust particles, the HEPA filters in our systems can last up to three years (depending on particulate load), thereby lowering unit maintenance costs. Lastly, all replacement filters are standard sizes, keeping costs at a minimum and even allowing for local supplying of them if necessary.

HEPA Locking Mechanism

The galvanized HEPA filter in the PAS1100 is mechanically sealed into place to prevent air bypass around the HEPA filter. Pressure applied by thumb screws compresses the HEPA's gasketing against the HEPA shelf to create a tight seal and ensure the unit's efficiency. Therefore, the PAS1100 can actually operate at HEPA efficiency. Each unit is individually tested prior to shipping and sent with a Performance Certificate to ensure and document unit efficiency.

Mobile Option

The PAS1100 is easily transported throughout the facility on heavy duty 3" locking casters. Convenient handles are located on the side of the unit to allow for easy navigation and movement through the facility.

Ease of Maintenance
All filters and lamps can be easily and quickly changed through the front-access hinged door without needing to use ANY TOOLS. The unit comes standard with a digital differential pressure gauge for showing when the prefilter and HEPA filter need to be changed, and an LED indicator that monitors functioning of the UV lamps.

Ease of Conversion to Negative Pressure/Recirculation System
The PAS1100 comes standard as a negative pressure unit with a 12" collar on the top for duct connection. However, if in-room air recirculation is desired, the unit can quickly and easily be converted into a recirculation system by simply installing the recirculation top. To do so does not require any tools at all, in that the recirculation top fits directly on top of the negative pressure top, and is latched into place by means of hinges on each side of the unit.

Location of blower
As recommended by ASHRAE and hospital guidelines the blowers in the PAS1100 are located after the filtration technologies (specifically the HEPA filter), thereby preventing contamination of the blower components.

Compliance with CDC and OSHA Guidelines
The technology and type of function provided by the PAS1100 is endorsed and recommended by the Center for Disease Control for control of Tuberculosis and other infectious disease. As such, when using the PAS1100 correctly, facilities comply with CDC and OSHA standards for infection control.

Safety Interlock
A safety interlock mechanism is in place that will automatically shut down all power to the unit when the access door is opened. This prevents direct exposure to UV radiation and to any powered electrical components.

Full Variable Speed Control
Allows for use in a wide range of rooms both small and large.
UV On/Off Switch:
The PAS1100 employs a separate switch that will turn the UV lamps on or off separately from the blowers. This allows consumers to turn off the UV lamps when running the unit if energy consumption is a concern, and if bacteria/mold

destruction is not a problem at the time. PAS recommends that prior to changing filters (especially the HEPA), the UV lamps should be turned on without the motor/blower in order to destroy any microorganisms that may be trapped on the filters. Given the HEPA will trap molds and bacteria as long as the motor is running, it is conceivable that live bacteria and mold could be trapped on the HEPA even after the unit is shut off but the motor winding down. Furthermore, larger molds that require higher UV dosages may not be fully destroyed if collected on the filter shortly before the unit/motor is shut off. These live microorganisms could become airborne if disrupted when changing the filters, creating a health risk. However, with the ability to keep the UV lamps on without the motor running for a short period of time, all latent bacteria and pathogens on the HEPA should be deactivated. Therefore, with PAS1100, consumers are ensured that the HEPA filters are free from contamination before they are replaced, creating a much safer environment when maintaining your air cleaner.

For further information:
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