

Airculeless

ULTRA CLEAN AIR

Permanently removes medical cannabis
odor & diseases



SPECIALLY ENGINEERED FOR MEDICAL CANNABIS

- Removes odors from the air permanently
- Kills and contains 99% of viruses, bacteria and fungi
- No risk of fungal growth and mold
- Capable of filtering high airflow volumes
- Saves energy due to low pressure drop

CHALLENGES OF GROWING MEDICAL CANNABIS

01

Medical cannabis odor control



02

Medical cannabis disease control



Treat the air inside the production areas

Odor control

During the flowering period the plant starts to stretch out and gets ready to show its flowers. By doing so it also creates crystal-like structures on the surface, known as trichomes. These trichomes are glands producing a resin that is rich in cannabinoids and smelly terpenes, which protect the plant from insects and fluctuating temperatures but are also responsible for the smell nuisance in surrounding areas. When significant amounts of cannabis plants are flowering at the same time, the nuisance of the smell in the area can be significant.

With the rise of cannabis farms, thanks to the legalization of medicinal cannabis production in several states and counties across the US, certain areas have become more and more popular to grow cannabis. The counterpart of this trend is that communities are experiencing a significant rise in complaints relating to smell nuisance. This has caused disagreements between local political parties, resulting in strict legal regulations. Cannabis growers are in the middle of these discussions because they are the source of the nuisance. The growers are obliged to reduce or even eliminate the odor nuisance in the area around the production site, having their permits depend on actions taken.

Disease control

Airborne pathogens are present in the air at all times. These pathogens consist of fungi, bacteria, viruses, smells, endotoxins, pollen and/or dust. Most of these are so small they are barely detectable. In many cases, when detecting them it is already too late.

This is no different when producing cannabis products. Mildew, Botrytis and Aspergillus niger are three diseases that are common threats when producing cannabis. These diseases most often spread via airborne particles and prevail under damp conditions. So in order to prevent Mildew, Botrytis and Aspergillus niger to appear in the crop, it is highly necessary to keep control of the greenhouse environment. Without the right environment for the disease to grow, it will be easier to prevent it from settling in the crop. To control the greenhouse environment it is possible to ventilate the warm and humid air through the ventilation roofs of the greenhouse but by doing so also open up the doors for other infections. Even though it is important to prevent diseases like Mildew, Botrytis and Aspergillus niger from growing, cannabis plants tend to grow better with relatively higher humidity levels, making it a complex balance between crop growth and disease control.



WHAT IS AIRCULESS

Airculess is a durable and high efficiency air purification system that combines innovative and proven filter technologies with the newest and state-of-the-art air cleaning techniques. The Airculess effectively cleans the air 24/7, without affecting the production and growth of medical cannabis plants.

The system is consciously engineered to work without the use of the traditional and expensive HEPA filter, ensuring a very high air purification efficiency and also has 80% less pressure drop resulting in substantial energy savings. The unique system permanently destroys odors, micro-organisms and removes ultra-fine dust from the greenhouse environment creating a healthy and pure environment for people and plants.

Dual stage filtering

The Airculess high efficiency air purification system works with a dual stage filtering principle. The dual stage filtering principle makes sure every filter to only capture the particles the filter is designed for, without polluting any of the filters with unintended particles, making the Airculess extremely durable and energy efficient.

In the first stage of filtering high efficiency ionization and electrostatic filters capture and eliminate the coarser particles, to preserve the durability and efficiency of the second stage filters. While in the second stage of filtering all remaining particles will be captured and eliminated by our state-of-the-art and patented TiO_x-eACF filter.



Manufacturing and certification

By only using parts that have been tested by various independent institutes and by having the machine built by an experienced manufacturing team, the device can be used anywhere in the world.

For use of the machine in the US, only UL-certified parts are used in the manufacturing process. While for use of the machine in Europe, only CE-certified parts are used in the manufacturing process.

Ultimate combination

With the Airculess integrating the highest level engineering together with the newest, most innovative and state-of-the-art technologies result in the ultimate combination of the most promising yet proven filter in the market.

Every piece, every part and every inch is specially engineered for use in medical cannabis. With our custom software uploaded as standard the Airculess is the best environmental control solution within medical cannabis, taking care of smelly odor and unwanted diseases threatening health and profit.



AIRCULESS

STAGE 1 FILTERING

In this first phase of filtering, coarse particles are captured using specially designed filters, supported by an ionization process. For this so-called electrostatic filtering system, the Airculess uses a sensor that controls the ion charges and adjusts them according to the amount of air pollution. This sensor control prevents an excessive amount of charged ions. By ionizing the air and collecting the ionized particles in specially designed and oppositely charged filters, we ensure that all microorganisms are completely destroyed and not just captured, as with traditional cloth filters. In addition, this electrostatic filter has a very low back pressure which makes the system more energy efficient.

Stage 1 removes particulate matter in the PM0.1-PM10 range and protects the Stage 2 filter components by filtering out excessive, coarse and unintended particles. With only odor and gases remaining, Stage 1 greatly increases efficiency and durability and drastically reduces the energy consumption of the Airculess.

How does stage 1 filtering work?

The air is sucked in from the top of the Airculess, where the coarse mesh pre-filters capture large dust particles and any excess moisture droplets. The air is then sucked through the ionizer tubes, where an ion charge is imparted to the remaining airborne particles. The Airculess uses a specially engineered ionizer with extreme low ozone levels. The extreme low levels of emitted ozone are captured and removed in Stage 2 filtering, resulting in virtually no impact on the growth of medical cannabis plants. The ion charged particles (from particulate matter to gases, emissions, VOC's and microbiological contaminants) are then captured in the counter-charged filters, below the ionizer tubes, making sure that no unintended particles are sucked into the Stage 2 filtering. Without those unintended particles the Stage 2 filter components are not unnecessarily polluted making all Stage 1 as well as all Stage 2 filter components high efficient and extremely durable. Some part of the odors are already removed by capturing the particles after the ionization process.

High performance electrostatic filter system

The Airculess ionization process charges the particles with a positive ion charge. Positive ion charging results in virtually no ozone emissions and much higher performance compared to most common ionizers, which charge the particles with a negative ion charge. The ion charged particles are captured by our specially designed statically charged filters in a closed system. Our specially designed statically charged filters acquire a negative static charge from the production process, making it a natural process and which makes them high performance filters.

Extreme low ozone levels

Capturing particles with an ionization process and a collection process is what is called an electrostatic filter. The electrostatic filter in the Airculess is custom made making it a high efficient and high performance filter. As a result the ionization process is only emitting extreme low levels of ozone in a closed ionization process, which ensures that no ozone escapes from the system. The amounts of ozone that are emitted within this closed ionization process are being captured and removed in Stage 2 filtering, resulting in an ozone free ionization process in the Airculess.



AIRCULESS

STAGE 2 TIOX-ACF

In the second stage of filtering, the in stage 1 pre-filtered air is guided through a state-of-the-art TiOx-eACF. The TiOx-eACF, which is short for Titanium Oxide enhanced Activated Carbon Filter, is a filter based on a unique combination of three proven and well-known techniques: activated carbon, TiOx (titanium oxide) and UV light.

In stage 2 filtering we capture and eliminate the remaining particles, which mostly are smaller in size and cannot be captured by any stage 1 filter component. After passing through stage 2, the air is cleaned for almost 99% of all particles like odor, harmful pathogens and gases.

How does stage 2 filtering work

The air is drawn into the TiOx-eACF filter compartment from the chamber in stage 1. From the outside-in the air is sucked into the TiOx-eACF filter through the activated carbon, adsorbing nearly all of the medical cannabis odor. With a process called photocatalysis, the adsorbed gases are then converted into less harmful and milder components such as CO₂ and water. The air leaving the Airciless is now (for 99%) free of odor, harmful pathogens and gases.

Stable performance with high humidity levels

Thanks to dual stage filtering all particles are captured. High humidity levels will not affect the TiOx-eACF performance. High humidity levels cause a faster photocatalytic effect, but lower the adsorption capacity. Low humidity levels cause a slower photocatalytic effect, but better adsorption capacity. These TiOx-eACF characteristics result in a very wide operating zone, which is not affected by humidity levels. In addition, during the engineering phases and also during the manufacturing phases we have paid extra attention to selecting the right quality raw materials well suited for the destination area of the Airciless. Our raw materials are geographically adapted, resulting in an optimal odor reduction.

Outstanding results and durability with UV light

The activated carbon used in the TiOx-eACF filter has an unprecedented advantage over other activated carbons. The activated carbon is treated with a special titanium-oxide-nano coating, enabling new functionalities such as improved adsorption and a photocatalytic effect when used in combination with UV light. At the core of each TiOx-eACF filter cartridge is a UV light source initiating the photocatalytic process and the self-cleaning and regeneration process of the activated carbon. The self-cleaning and regeneration process have a positive effect on the life span and efficiency of the activated carbon used in the TiOx-eACF filter. Our nano coated activated carbon has an enhanced life span, which is much longer than other activated carbon.

AIRCULESS FOR YOUR BUSINESS

By partnering up with our carefully selected suppliers, TEG-Envinity is able to deliver best-in-class solution for controlling medical cannabis odor and disease pressure. Our partners work closely together with our highly valued R&D experts resulting in integrating the most innovative yet proven technology in Airculless.

Odor regulations

With the use of Airculless, medical cannabis odor can be prevented from being experienced within residential zones, as set by your county. Every facility is unique in it's specifications and surroundings, therefore projects cannot be threatred with a standardized solution.

Each facility will be analyzed on multiple parameters which result in a custom made plan. By performing these essential analyses and implementing Airculless in your facility, we enable you to comply with any government odor regulation while preserving your growing permits.

Disease pressure

Other than removing medical cannabis odor, the Airculless also reduces the disease pressure caused by airborne microorganisms e.g. Mildew, Botrytis and Aspergillus niger. This can lead to several benefits: less diseases, healthier crop, less losses and a positive impact on business profits.

Tailor-made solution

Our team is well trained and has years of experience with the agricultural industry, including medical cannabis. They give you clear insight into what is needed for your facility. Based on multiple parameters, calculations can be made to achieve optimal results.

When you choose for TEG-Envinity, you also choose for the best technical knowledge and a team that understands your product and process.



AIRCULESS

TECHNICAL SPECIFICATIONS*

Product name	Airculess
Start	Slow start
Capacity	5000 m ³ /h (2943 cfm)
Power	1500W (normal conditions)
Sound	70db
Efficiency	99%
Size	957 x 1305 x 2749,5 mm
Weight	700KG (1543 lbs)
Materials	Stainless steel
Power input	480 VAC 3 phase delta

Absolute maximum power consumption: 4kW per unit
based on: 2.4kW maximum fan power and 1.6kW
maximum 480/110 VAC transformer.

*Specifications subject to product updates and changes





CONTACT

TEG-ENVINITY

+1 805-566-0917
info@totalenergygroup.com

5154 Foothill Rd
Carpinteria
CA 93013
United States

