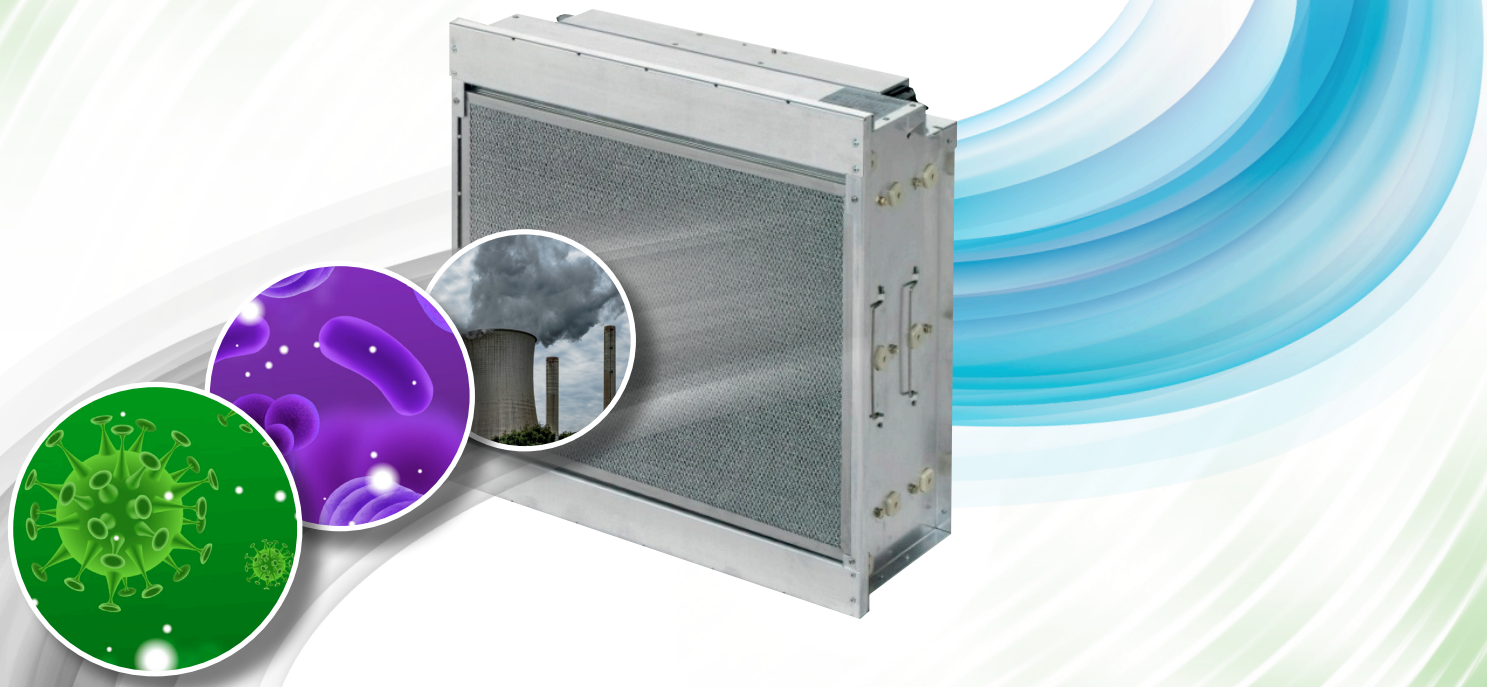
expansion® electronic

BETTER AIR FOR A BETTER QUALITY OF LIFE

SUSTAINABILITY: OUR FOREVER GOAL



Active electrostatic filtration technology

Sustainability for us **is:**

Starting from an **idea of the future**.

From a future where **innovation**

and sustainability move in the same direction.

Where **research and design** create a shared value.

A future where use of **advanced filtration technology**

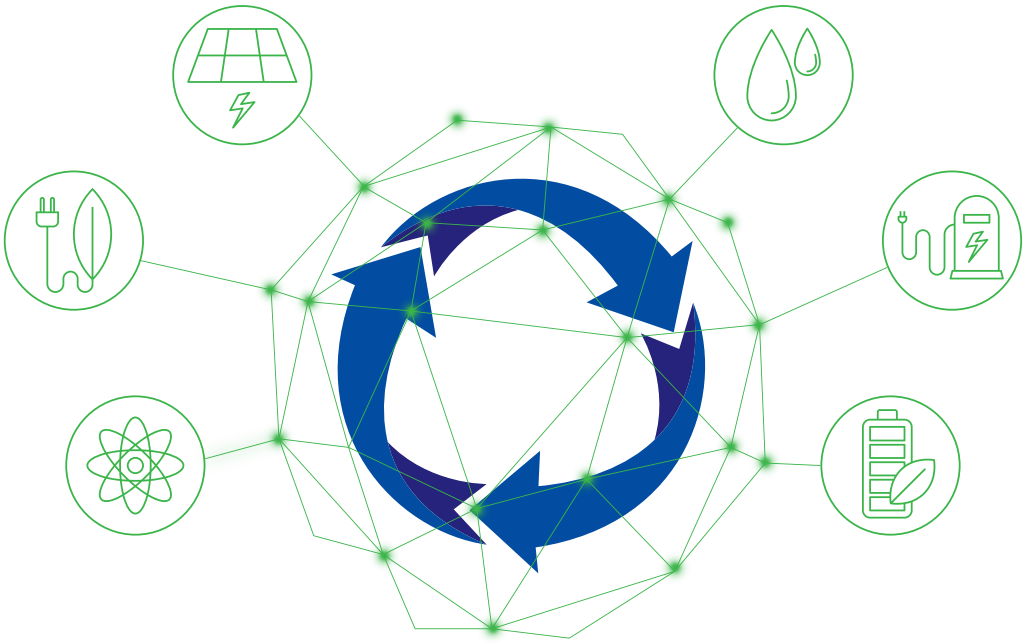
makes life safer and more enjoyable.

Where **innovation means Progress**.

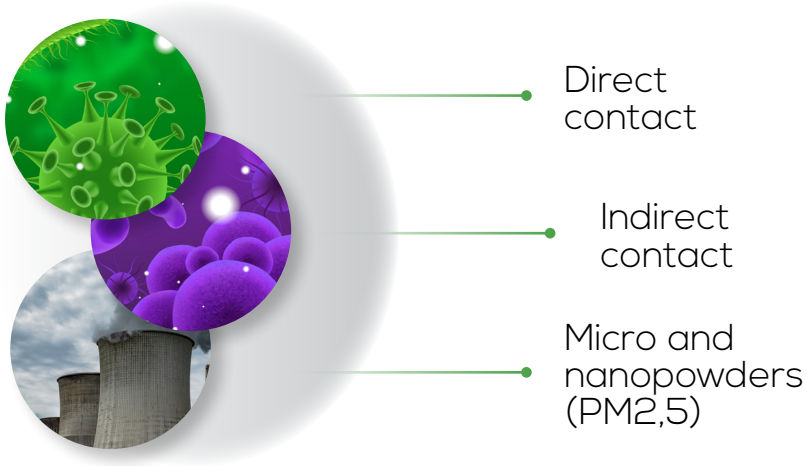
Because the future we are aiming for is based on

sustainability that improves the quality of life

on the planet for us and for future generations.



The importance of **indoor air quality**



The role of air conditioning, ventilation, air treatment and filtration systems is central **in reducing the risk of infection from viruses such as COVID-19, bacteria and airborne pollutants**. The active electrostatic filter, thanks to its high certified filtration efficiencies, **guarantees the capture and the incativation of these micro organisms**.

Experts confirm that **better indoor air quality** guarantees the reduction of respiratory diseases, allergies, asthma, blood pressure problems, insomnia, irritability and inability to concentrate, contributing to **greater comfort and well-being of people** in their homes, in the workplace and leisure.

The neutralization of viruses and bacteria through an active electrostatic filter also ensures **the reduction of risks for the operators** involved in the installation and maintenance of ventilation systems, unlike other systems that capture pathogens without inactivating them.

In addition to this, of course, it is necessary to comply with the rules issued by the WHO in terms of social distancing, hand and surface sanitation, use of masks.

GENERALITY

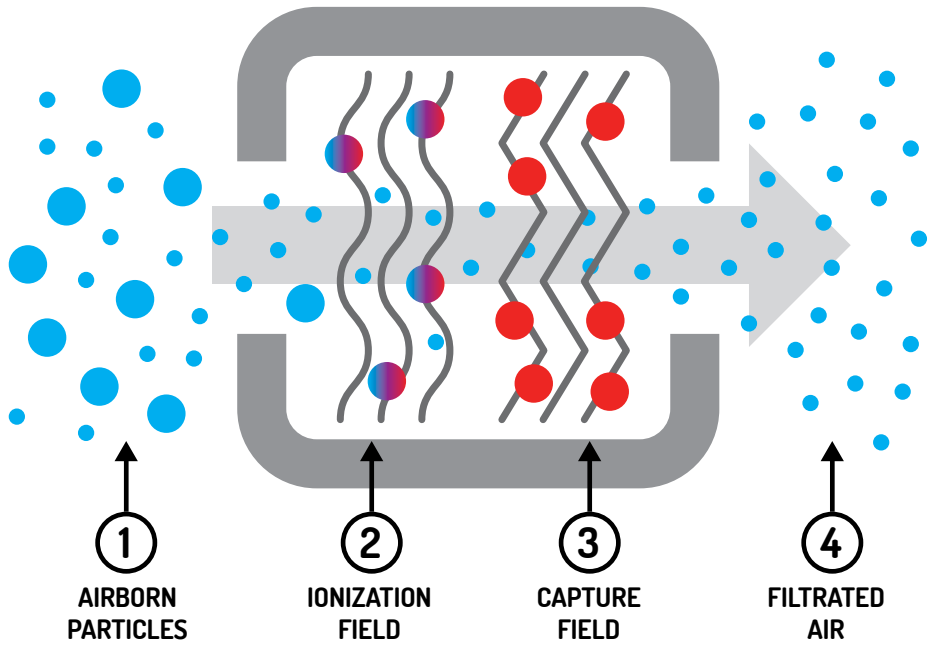
The use of static electricity for air filtration dates back to the early 1900s, when a device just patented in the United States was used for the abatement of fumes from a plant for the synthesis of sulfuric acid.

Thanks to the specialization for different applications and the evolution of materials and regulation and control systems, this principle is now available in numerous construction variants of different complexity, aimed at specific uses such as HVAC systems **in the residential and commercial sectors, industrial, hospitality, naval, hospital, food.**

OPERATIONAL PRINCIPLE

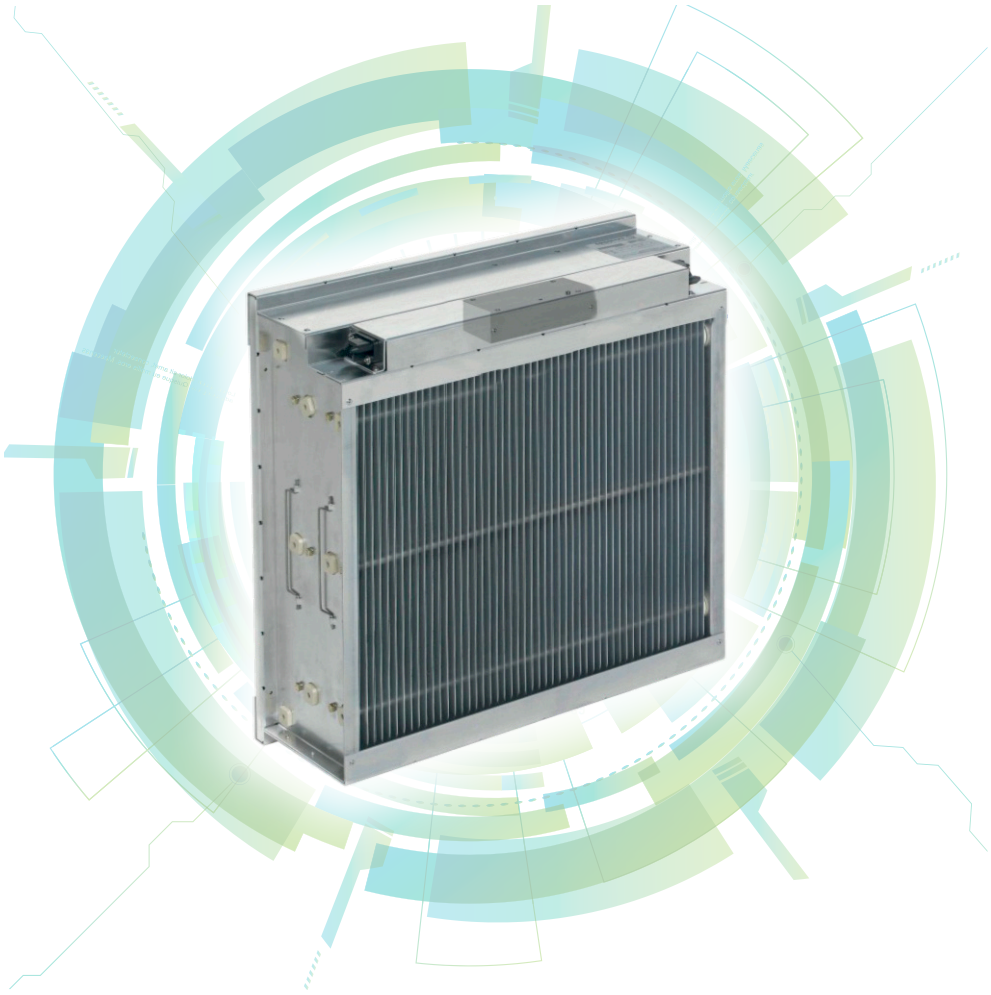
The operating principle of the active electrostatic or electronic filter is based on the electrostatic precipitation process, the effect of which is comparable with the attraction of iron objects towards a magnetic field. The air flow that passes through the electrostatic filter when it comes into contact with the filter is affected by 2 main phases:

1. transfer of an electric charge to the particles (ionization) phase n ° 2,
2. capture of particles (capture) phase n ° 3



CONSTRUCTION FEATURES

The **FE SYSTEM** series consists of a new range of active electrostatic filters, very practical and usable in replacement or in addition to traditional mechanical filters, in new and/or existing systems without any adaptation costs.



FE SYSTEM active electrostatic filters consist of an aluminum metal body, which during the filtration process intercepts the pollutant accumulating it on the collection blades.

Its adoption in ventilation systems and in particular in the air conditioning sector does not require changes in the structural and dimensional characteristics of the system.

Dimensions standardized according to the international standard EN 15805.

CONSTRUCTION FEATURES

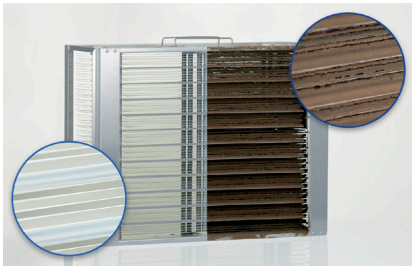
1 - ADAPTABLE

One of the main features of the **FE SYSTEM** Filters is their adaptability to countless applications in various sectors, thanks to the standard sizes compatible with those of bag filters.
AIR CONDITIONING: installation inside HVAC systems (AHU, Rooftop) in the residential, commercial, industrial, hospitality, naval, hospital, food sectors.
INDUSTRIAL: Filtration of micro dust, rubber and plastic fumes, fumes in general, welding fumes (such as ferrous metals, precious metals, control panels) with a maximum concentration of 20 mg / m^3.
HOSPITAL: Control of airborne contamination for hospital rooms, clean rooms, clinics, waiting rooms.
FOOD: Control of air contamination during food processing processes.

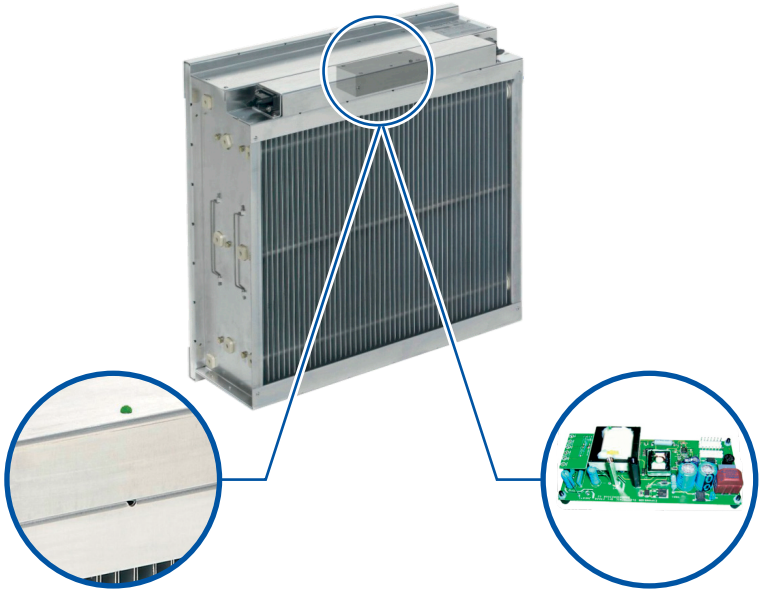
2 - REGENERABLE BY WASHING

The **FE SYSTEM** filter consists of an aluminum metal body that gets dirty by accumulating the filtered pollutant on the internal plates.

When the filter is saturated, the LED starts flashing. It is sufficient to perform a simple washing with water and a little alkaline detergent to remove the dirt. During this operation, the electronics on board must not be removed because they are protected by waterproof resin coating.



3 - ONBOARD ELECTRONICS



Led

Through the multipolar connectors it is possible to connect multiple filters together with a single power supply line (230V - 50 HZ) and provide the alarm signal. Fully waterproof integrated electrostatic circuit.

Electronic circuit

Another feature that distinguishes FE SYSTEM filters is the onboard electronics that generate the high voltage necessary for the filter to function.

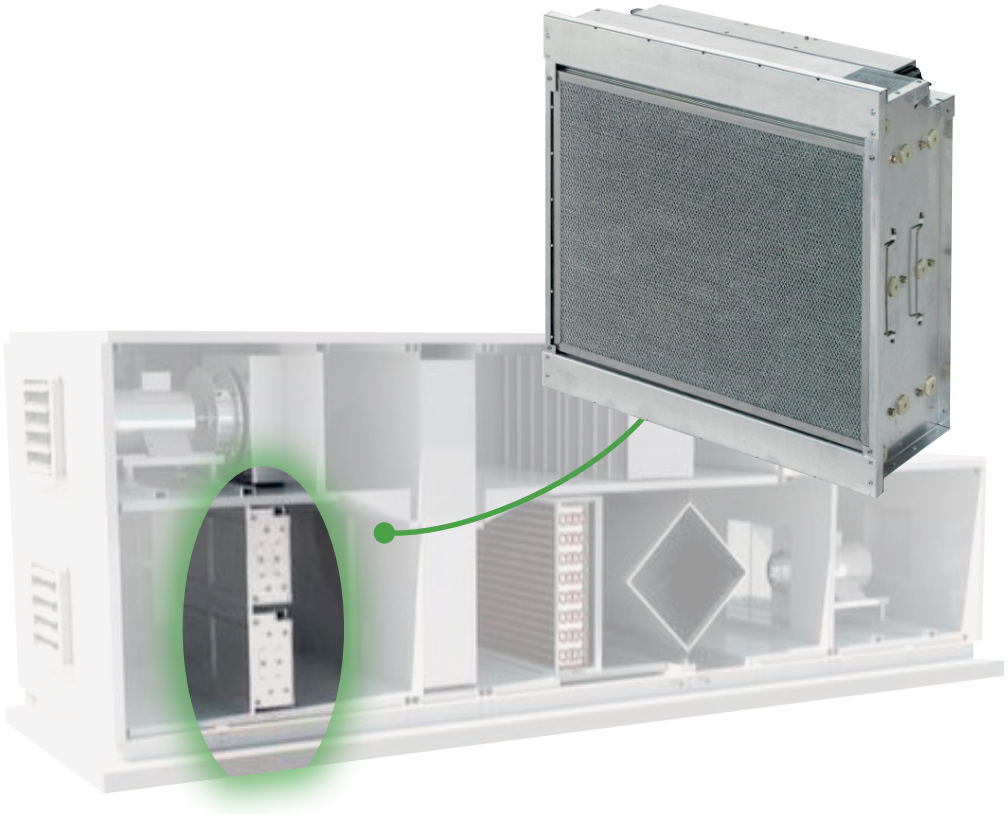
4 - CERTIFIED EFFICIENCY

The **FE SYSTEM** filters have been tested by independent, autonomous and international bodies, which have issued the following certifications:

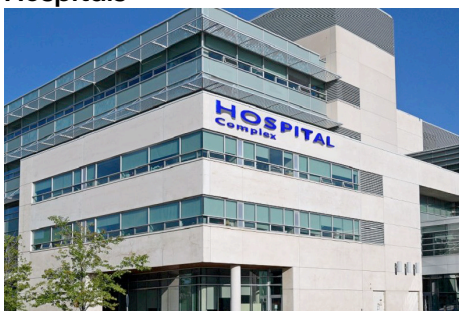
UNI EN ISO 16890	Classifies **FE SYSTEM** filters for air based on their ability to retain airborne particulate matter (PM10, PM2.5 and PM1). International certification
UNI 11254 : 2007	Classifies **FE SYSTEM** Filters in four filtration grades (A, B, C, D) Italian Certification
EN 1822 : 2005	Classifies **FE SYSTEM** Filters as Absolute Filters (class E10-E11) International Certification
EN 779 : 2012	Classifies the **FE SYSTEM** Filters as Fine Filter (class F7-F9) International Certification

FE SYSTEM

Active electrostatic filter for Air Handling Units and Rooftops.

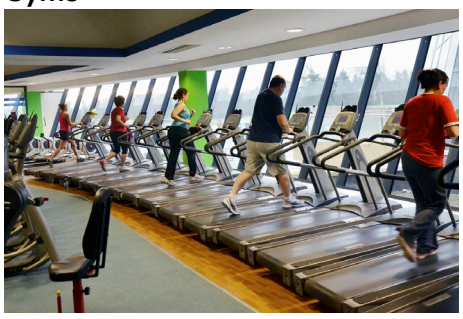


Hospitals



Airports

Gyms

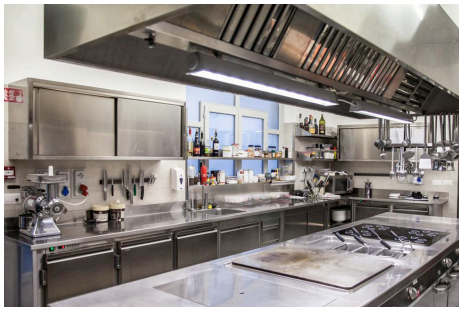


Banks

FEL SYSTEM

Active electrostatic filter for industrial and commercial kitchens

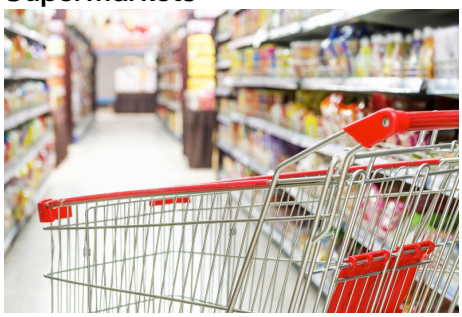
Kitchens



Restaurants

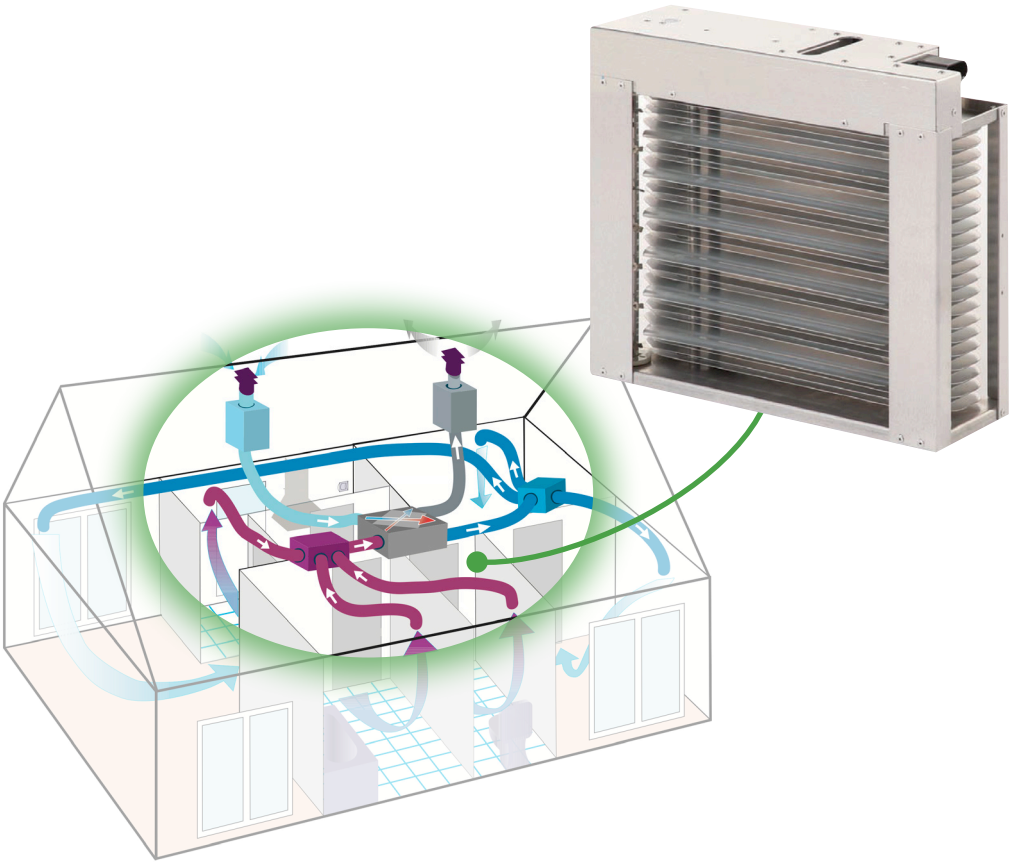
Fast food

Supermarkets



FCP SYSTEM

Active electrostatic filter for CMV systems.



Schools

Residence

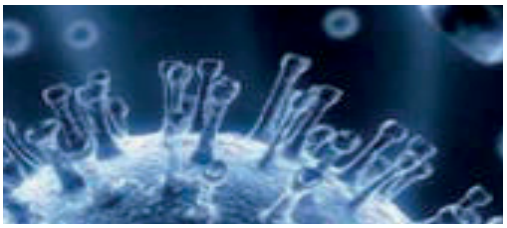
Offices

Medical clinics

ABATEMENT OF VIRAL AND BACTERIAL LOADS

Electrostatic filters are extremely efficient on **pollens, fine powders, toner, molds, smog, bacteria and viruses such as COVID-19**.
As documented in the technical and scientific literature and on the basis of specific tests and laboratory tests (**ILH Berlin, San Matteo Pavia and University of Lucerne**), active electrostatic filtration systems are able to capture, retain and make inactive from the flow of treated air, with an **efficiency between 98.5% and 99.9%**, microorganisms such as:

- airborne bacteria, such as Micrococcus luteus,
- yeasts, such as Rhodotorula rubra,
- Bacillus Anthracis,
- molds and germs, present in the natural spectrum of air



ENERGY CONSUMPTION

The filter is powered through the integrated electronic board. The integrated electronic circuit is completely watertight (waterproof).
The power supply is 230V -50/60 Hz.
The **electrical absorption** of the filters, even at full load, has a **negligible impact (less than 1%)** on the overall behavior of the treatment unit.
The **absorbed electrical power** is **0.016 W** for large size filters and **0.09 W** for smaller size filters.
It is estimated, following real tests carried out, that in an average air treatment plant, **energy saving is 30% per year.**

ENERGY COMPARISON

MECHANICAL FILTER
VS
ACTIVE ELECTROSTATIC FILTER

With the new **UNI EN ISO 16890** classification, the **FE SYSTEM** active electrostatic filter by Expansion Electronic **is the only air filter with constant and real A + energy classification over time.**

	Mechanical Filter	Active Electrostatic Filter
Pressure drop	They increase as more synthetic powder i s added during the test.	At 300g of injected powder, the pressure drops remain constant. The variations are so low that the energy costs are certain.
Energy Class	A+ only if the filter is replaced with a high periodic frequency.	Energy class **A+ guaranteed and constant.**
Replacement	To maintain the class A+, the filter must be replaced when it reaches 90 Pa of pressure drops. If the filter is not replaced, it is downgraded as energy consumption increases.	To maintain the class A+ the filter can reach 300g of dust accumulation keeping the pressure drops constant at 62 Pa. With an accumulation of 600g, the pressure drops have a variation of only 20 Pa, still guaranteeing the energy efficiency class A+.

ECONOMIC ANALYSIS

High performances of electrostatic filters are accompanied by important benefits mainly due to:

- **Pressure drop on the airflow side** is absolutely modest, determined almost exclusively by the metal prefilters G2 or G4. This results in a significant reduction in the energy consumption for ventilation, with the filtration efficiency that stays constant throughout the operating cycle;
- **The life cycle of the filters is equal to the life of the machine itself (15-20 years)**: the soiling of the electrostatic filter is signaled by a sensor that allows to program its periodic maintenance. The user can easily do maintenance by himself, without any need to replace the filtering septum as is the case of traditional cells.

CONCLUSIONS

Which technology or filtration system today is more effective, performing, safe and sustainable at the same time?

The parameters for choosing one air filtration technology over another may vary according to different needs, probably the degree of efficiency first.
Ensuring **maximum environmental comfort and efficient air sanitation,** in total safety, have become an essential priority in modern civilization, however this must no longer compromise the resources of our planet, which is already hopelessly exploited and damaged.
Our prerogative is to be able to offer an air filtration technology that simultaneously and in a single product contains **the parameters of efficiency and hygiene, energy saving, safety and respect for the environment** using a material, aluminum, totally recyclable and above all avoiding continuous disposal of plastic.
We want a future where **innovation and sustainability** move in the same direction to **improve the quality of life** on the planet for our and future generations.

Help us in this new challenge.

Expansion Electronic, with a view to social, economic and environmental sustainability, is committed to ensuring high filtration efficiency (IAQ), energy saving and using renewable and recyclable materials, preserving the environment thanks to products with long life cycles.

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