

ELECTROSTATIC FILTER FEL SYSTEM



DESCRIPTION

Building on the reliability and the success of the FE SYSTEM range, thanks to our experience in the applications of particular food-agricultural processes, we have been able to conceive and develop the FEL SYSTEM range. This is a new range of active electrostatic filters with built-in electronics, for oil and oily vapour applications.

FEL SYSTEM represents a revolutionary development and a valid alternative to traditional filters. It was conceived to facilitate the use of electrostatic oil filters for specific processes. Its use in agricultural-food plants ensures consistent filtration efficiency.

Thanks to high separation and oil accumulation capabilities, because of low load losses, it also provides important energy saving. Its multipole connection system means that several filters can be connected at the same time, depending on the air flow and filtration requirements. In addition, electrostatic filters can be installed and removed by simply sliding them across the equipment filter frame support.

The built-in electronic power input circuit is equipped with LED to notify the user that the filter is working correctly. A customized range of electrostatic filters without built-in electronics is also available for oil and oily vapor applications.



ELECTROSTATIC FILTER FEL SYSTEM

CHARACTERISTICS

FEL filters are particularly suited for the abatement of polluting substances such as oily vapours and mists, with and without particulate. The main distinguishing characteristic of this filter is the bottom section of the capture blades, the shape of which has been purposely conceived to enable the dripping of high quantities of oily pollutants, with reduced formation of electric discharges between the plates. In addition, the special mechanical construction ensures, also in the presence of emulsifying oils, that no electric discharges occur on the insulator, therefore providing high reliability in the long term.

The open bottom part makes it possible to collect, in appropriately conceived containers, the condensation formed during the filtration process. The high separation performance together with a high capability of capturing particulate, also makes it possible to obtain compact abatement systems with low load losses virtually consistent across time and with high levels of efficiency. It is therefore possible to obtain a reduction in electric consumption when compared with other systems using mechanical filters.

From an operating point of view, the FEL600 filter is capable of condensing hundreds of grams of oil every day. Furthermore, this filter is certified for the Ozone emissions, which are significantly lower than the maximum set by the legislation.

In addition, the Expansion Electronic electrostatic filters subjected to the tests of the UL867 standard have passed the tests and achieved the UL certification, a US standard that relates to the safety of equipment and specifically deals with the Safety of Electrostatic Air Filters.



EASY INSTALLATION

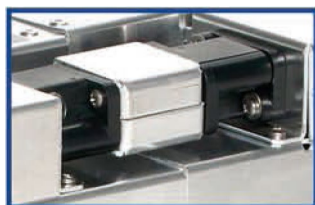
The FEL SYSTEM represents an alternative to the common pocket filters and it is conceived to simplify the use of electrostatic filters.

Its adoption within ventilation systems in general, and more specifically in the air conditioning plants, does not imply any variation regarding constructive and dimensional characteristics of the plants themselves.

Thanks to its multipolar connection system, the installation of FEL electrostatic filters becomes simple, then it's enough to slide in and out the filtering units inside the filter frame support.



PSC - POWER SUPPLY CONNECTOR



JC - JUNCTION CONNECTOR



FCC - FINAL COVER CONNECTOR

APPLICATION SECTOR

FOOD: Control of airborne contamination during food processes

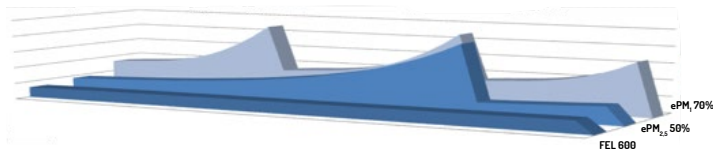
ENERGY SAVING

In the active electrostatic filter FEL SYSTEM, the initial pressure drop increases slowly while the filter gets dirty. This characteristic, combined to an extraordinary capacity of pollutants accumulation, allows the filter to have a long operation time between maintenance and the other one.

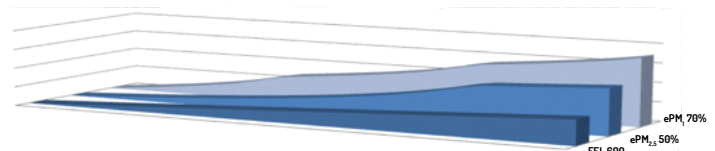
In a traditional pocket filter the initial pressure drop is higher than in a FEL SYSTEM, and it increases considerably during its clogging. The pocket filter must be replaced when it reaches the maximum pressure drop of 300 Pa.

Comparing the FEL SYSTEM with two other different filtering systems, operating at the same contaminated indoor air conditions and at the same air flow capacity, we can observe that the FEL SYSTEM has a pressure drop that grows very slowly, while a pocket filter ePM_{2.5} 50% (ex F7) reaches the max pressure drop of 300 Pa before the filter is saturated. Even more evident is the operation time of a pocket filter ePM₁ 70% (ex F9) that needs to be replaced three times in the same period of operation compared to FEL SYSTEM.

A higher flow restriction means merely higher energy consumption for the pocket filters. Compared with an electrostatic filter FEL SYSTEM, we can estimate a double energy consumption using an ePM_{2.5} 50% and three times more using an ePM₁ 70%.



AIR PRESSURE DROP



ENERGY SAVING

COMPLETELY REGENERABLE

The electrostatic filter FEL is embedded with a rigid rugged aluminum frame which gets dirty by attracting and holding airborne particles of pollutants which remain accumulated on collector plates. When the filter is saturated, it is sufficient to wash it with water and detergent to remove dirt and regenerate the filter without removing the electronics as it is completely resined and watertight. (Waterproof). This avoids disposal and replacement costs.

An adequate filter cleaning guarantees efficiency and long-lasting performance, equal to the life of the machine in which it is installed (Long Life Cycle).

INCORPORATED ELECTRONIC

The electronic circuit permits to generate the necessary voltage directly in the filter.

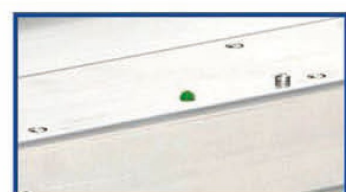
Through the multipolar connectors PSC, JC, FCC, it is possible to carry the power supply to the filter with power voltage of 230V-50Hz, combine multiple filters in a row and give out alarm signal.

Efficient watertight solutions allow the electronic box to be bathed with the filter during the maintenance instead of being removed.

The circuit is also equipped with a thermal sensor which automatically blocks the operation of the filter when too high temperatures are reached, guaranteeing a thermal protection.



ELECTRONIC CIRCUIT



LED

TECHNICAL SPECIFICATIONS

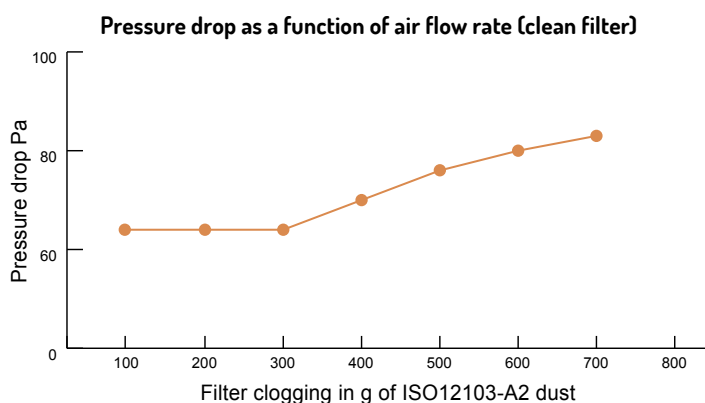
| Model | Dimensions | Weight Kg | Energy consumption W | Accumulation capacity g | Air flow capacity m ³ /h | | | | | Annual energy consumption (KWh/Y) | |
|----------|-------------|-----------|----------------------|-------------------------|-------------------------------------|------|------|------|------|-----------------------------------|----|
| FEL150RV | 287x287x218 | 4,5 | 9 | 140 | 200 | 400 | 550 | 625 | 700 | 150 | A+ |
| FEL250RV | 490x287x218 | 8 | 9 | 216 | 380 | 480 | 600 | 720 | 800 | 170 | A+ |
| FEL250 | 287x490x218 | 8 | 9 | 216 | 470 | 600 | 750 | 900 | 1200 | 256 | A+ |
| FEL300RV | 592x287x218 | 9 | 9 | 240 | 250 | 500 | 630 | 720 | 1000 | 213 | A+ |
| FEL300 | 287x592x218 | 10 | 9 | 280 | 600 | 800 | 1000 | 1200 | 1600 | 341 | A+ |
| FEL450 | 490x490x218 | 14 | 16 | 378 | 820 | 1050 | 1310 | 1570 | 2100 | 448 | A+ |
| FEL500 | 490x592x218 | 16 | 16 | 494 | 1070 | 1400 | 1730 | 2100 | 2770 | 590 | A+ |
| FEL550 | 592x490x218 | 16 | 16 | 460 | 990 | 1270 | 1590 | 1910 | 2550 | 544 | A+ |
| FEL600 | 592x592x218 | 19 | 16 | 600 | 1300 | 1700 | 2100 | 2550 | 3400 | 702 | A+ |

| FILTRATION CLASS ACCORDING TO UNI EN ISO 16890 | ePM% | ePM ₁ 95% | ePM ₁ 95% | ePM ₁ 90% | ePM ₁ 80% | ePM ₁ 70% |
|--|--------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| Filtration class according to UNI 11254 | (A, B, C, D) | A | B | C | D | - |
| Filtration class according to EN 1822 | (E10 - E11) | E11 | E10 | - | - | - |
| Air speed passage on the filter | m/s | 1 | 2 | 2,5 | 3 | 4 |
| Percentual of max air flow capacity | % | 40% | 50% | 65% | 75% | 100% |
| Pressure drop according to ISO 16890 | Pa | 10 | 17 | 24 | 37 | 64 |

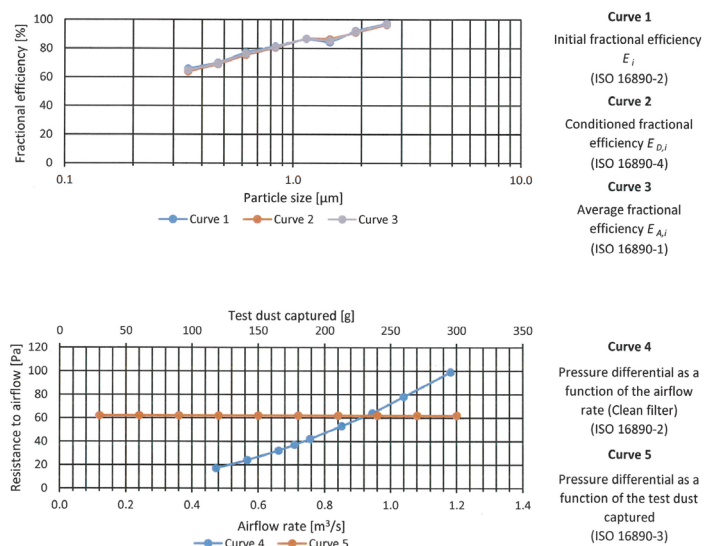
| | | | | | | |
|--|----------------|---|---|----|----|----|
| Filtration class according to old EN 779 | (F7 - F8 - F9) | - | - | F9 | F8 | F8 |
|--|----------------|---|---|----|----|----|

FRAME material: aluminium - PREFILTER material: metal mesh

CHARTS



Test performed at 3400 m³/h - Speed air passage 4m/s



CERTIFICATIONS

ILH BERLIN
INSTITUT FÜR LUFTHYGIENE

BSRIA

CETIAT
ensemble, innover et valider

Consiglio Nazionale delle Ricerche



POLITECNICO DI TORINO



Instituto Argentino de Normalización y Certificación



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