





## New Air Intake Filtration System® for gas turbines

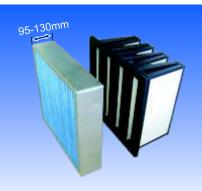
### **Advantages of new system:**

- Compactness the reducing size to place 2<sup>nd</sup> and 3<sup>rd</sup> step of filtration system.
- Increasing the arae filtration of prefilters more 100%.
- Reducing the pressure drop at 40-80 Pa.
- Increasing the efficiency of gas turbine at 0.06-0.12%.
- Increasing the life time of pre filters class G4 comparable with the fine filters class F8-F9.
- Reducing the maintenance expenses not necessary to change pre filters during the operation of gas turbine at least for a year or more.

### **Existing types of air intake systems**

### Variant #1

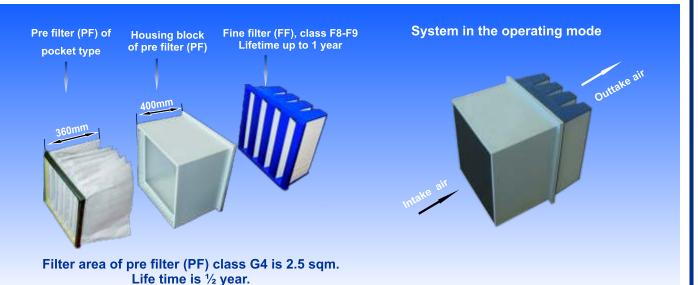
Il Step Pre filter (PF), class G4 Filter area is 2-2.5 sqm Life time is ½ year



III Step Fine filter (FF), class F8-F9 Life time is up to 1 year

- \* PF pre filter
- \*\* FF fine filter.

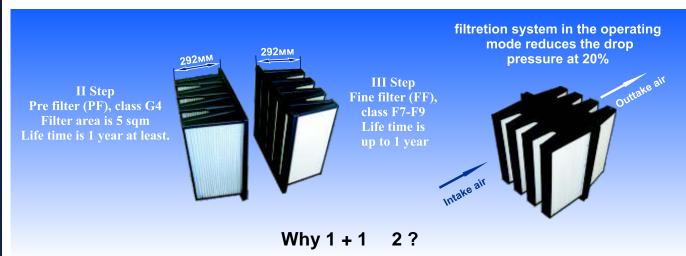
#### Variant # 2





## New System of 3-Steps Filtration (the fine cleaning)

At the 1st step of filtration is used standard coalescer filters, and at the 2nd and 3rd teps is used pre filters (PF) and fine-filters (FF) as shown on the scheme below.



The pressure drop of the filter could be calculated as:

 $\Delta PF = \Delta PIn + \Delta PFPack$ 

where are:

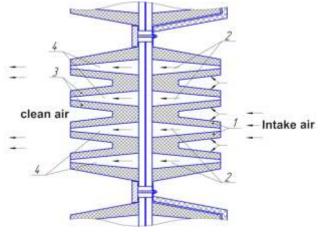
 $\Delta PF$  – the pressure drop of the filter;

 $\Delta PIn$  – the pressure drop of the airflow at the intake of Air Filter;

 $\Delta$ PFPack – the pressure drop of the airflow is flowing through the filter pack.

As shown on the picture below, both the pre filter (PF) and fine filter (FF) are mounted to each other so, that the output channels of pre filter (PF) are the continuation of the input channels of fine filter (FF). Thus, it eliminates the input pressure drop at the input of the filter, which is 40 Pa at the airflow of 3400 m3/hour.

The pressure drop for both filters are mounted separately is equal the pressure drop to each of them, but new filtration system eliminates the pressure drop at the intake of the fine filter (FF). Thus, the pressure drop for both filters are mounted accordance with the new scheme is less than the pressure drop for two filters are mounted separately.



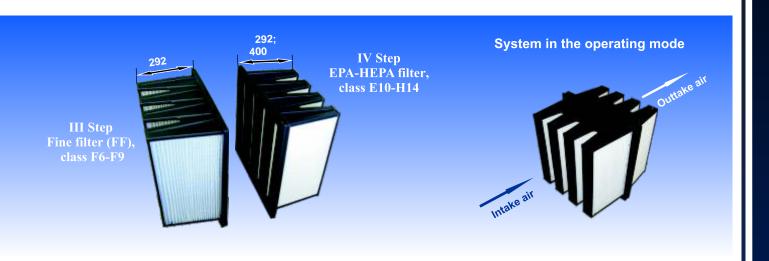
### Scheme of 2-Step Filtration

1 – the filter packages of pre filter (PF), class G4; 2 – the output channels of pre filter (PF); 3 – the filter packages of fine filter (FF), class F7-F9; 4 – the input channels of fine filter (FF)

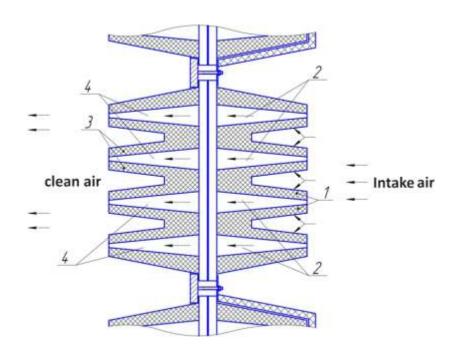


# New System of 4-Steps Filtration (the finish cleaning, class E10-H14)

At the 1st Step of filtration is used standard coalescer filters (CF), and pre-filters (PF) of class G4 at the next step. The scheme of 3rd and 4th Steps is shown below.



## Reducing the pressure drop at 40-80 Pa $1 + 1 \neq 2$



### Scheme of 4-Stage Filtration

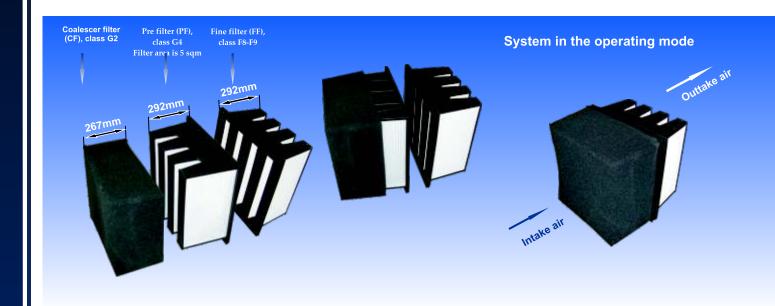
1 – the filter packages of fine filter (PF), class F6-F9; 2 – the output channels of fine filter (PF); 3 – the filter packages of fine filter (FF), class F6-F9; 4 – the input channels of fine filter (FF)

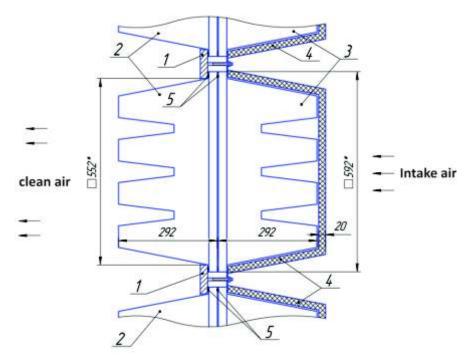


# New Compact Air Intake Filtration System for gas turbines

### Advantages of new system:

- Increasing the filtering area of coalescer filter up to 30%.
- Increasing the filtering area of pre filter up to 100%.
- Increasing the life time of pre filter class G4 up to 1 year and more.
- Reducing the total drop pressure at 80 Pa for 3 (three) steps of filtration.
- Increasing the efficiency of gas turbine at 0.12%.





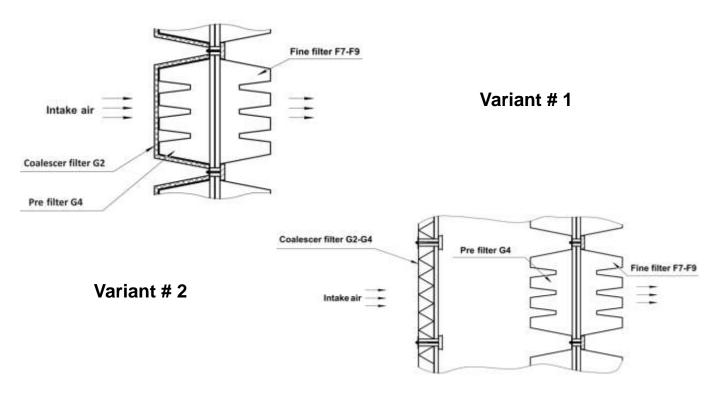
### **Scheme of Compact Filtration System**

1 – the supporting wall of the filter chamber of the Air Intake System; 2 – the fine filter (FF); 3 – the pre filter (PF); 4 – the coalescer filter (CF); 5 – the gasket



## Different types placement of filters in air filter housing gas turbines

### **3-Steps Filtration**



## **4-Steps Filtration**

