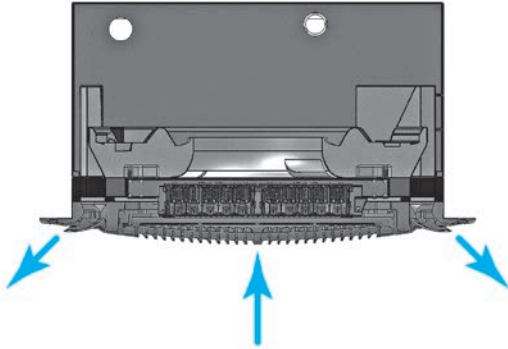
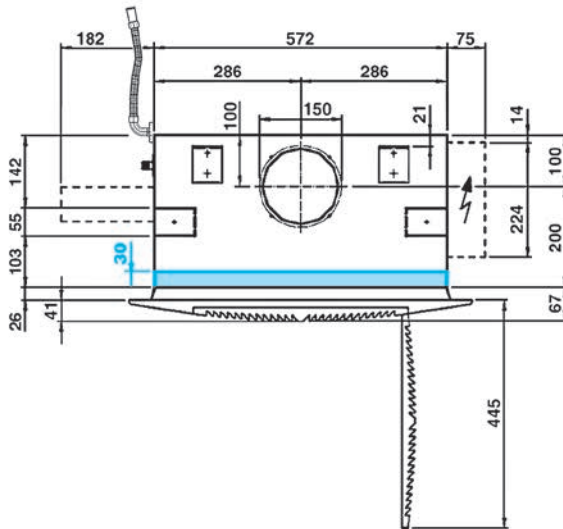


**Introduction**

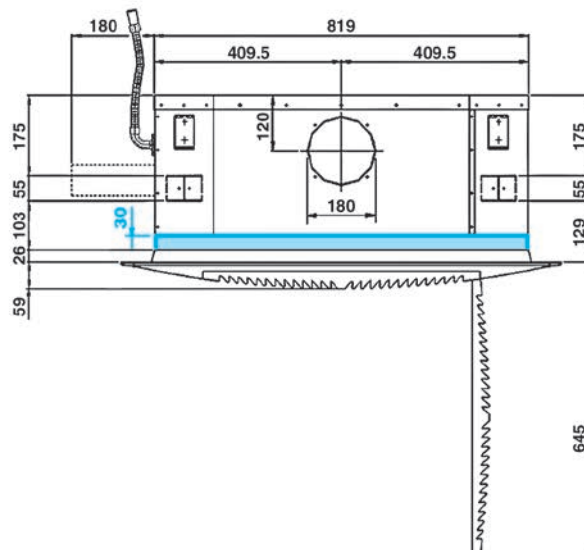
**Cassette SkyStar** can be equipped with the innovative plate type electrostatic filter, **Crystall**, combining air treatment and purifying in a single product.  
The electronic filter is patented and certified according to Standard UNI 11254.



**Dimensions**



**SK 0 / 1 / 2 / 3**  
(Model 600 x 600)



**SK 4 / 5 / 6**  
(Model 800 x 800)

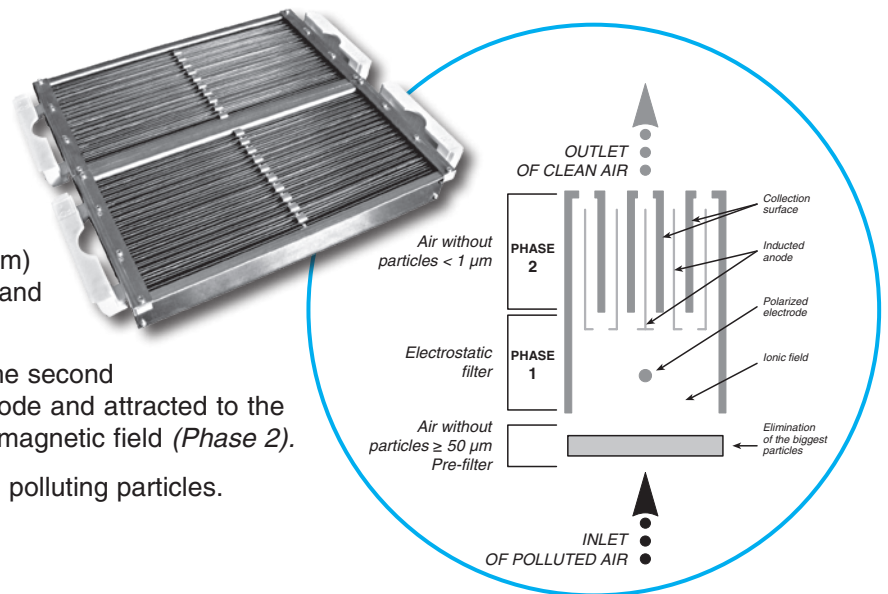
## Operating principle of the electrostatic filter

When the polluted air goes through the mechanical pre-filter the particles  $\geq 50 \mu$  are eliminated (powder, insects, etc).

Then the smallest particles ( $50 \div 0.01 \mu\text{m}$ ) are exposed to an intensive ionizing field and are polarized (*Phase 1*).

The charged particles passing through the second filter section, are pushed back by the anode and attracted to the collection surfaces by a strong, induced magnetic field (*Phase 2*).

The air which leaves the unit is free from polluting particles.



## Indoor air quality (IAQ)

The expression Indoor Air Quality (IAQ) covers all the procedures and methodologies used to **improve the quality of the air we breathe** in the places where we live and work, from all points of view, from temperature to cleanliness, to relative humidity, etc. (EN 15251 and EN 13779). Thanks to its new patented electronic filter, the **Crystall electrostatic filter totally eliminates the pollutants present in the air**, including tobacco smoke, dust (PM10, PM2.5), fibres, microbiological substances such as bacteria, fungi, etc., which are harmful to human health (source: OMS 2009). Purifying the air means not only greater well-being, but also energy saving, as the fresh air changes that are required to restore ideal climatic conditions and that entail greater consumption, are significantly reduced (it is sufficient to enter the quantity of air required to restore the optimum level of  $\text{CO}_2$  - source: EN 1379:2008). Moreover, according to the UNI 10339rev, air recirculated by the **Crystall** appliance can be considered as fresh air, to be added to the minimum requirements (0,5 ls/m<sup>2</sup>). Purifying the air with the Sabiana **Crystall** appliance also **entails no reduction of living room space**, as the dimensions of the fan convector are practically unchanged (just 3 cm higher). The positioning of the electronic filter allows **simple and effective maintenance** and, as it is easy to wash, **its working life is practically unlimited**. The modularity of the filter components and their ease of mounting make the system extremely competitive in terms of cost compared with other types of filters present on the market. In spring and autumn, if air conditioning/heating is not required, the appliance acts simply as an **air purifier**.

## Standards and legislation

### THE AMBIENT CONDITION IS ACCEPTABLE WHEN:

- **Microclimatic parameters are normal**
- **80% of people are satisfied by the quality of air**
- **Specific internal contaminants are not in harmful concentrations**

*“Guidelines for the protection and promotion of health in confined areas O.G.  
No. 276 dated 27 Nov 01 ordinary supplement no. 252”*

The method for obtaining the air quality required in confined areas and thus succeeding in ensuring that the contaminants present are in concentrations less than those considered dangerous to health are:

**Prescriptive approach:** ventilation of the internal area using only properly filtered fresh air, in the quantity and quality needed to dilute the internal contaminants in order to reach the required maximum acceptable concentration values (see WHO limits).

**Performance approach:** ventilation with fresh air and recirculated air from the same area, both properly filtered, in the quantity and quality needed to dilute the internal contaminants in order to reach the required maximum acceptable concentration values (see WHO limits).

The quantity and quality of recirculated air and outdoor air to be added is better specified in the prescriptive and performance approach in Standards UNI EN 13779:2008 and soon to be released UNI 10339rev according to the following simplified tables.

PRESCRIPTIVE METHOD	<b>UNI EN 13779:2008</b>			
	CATEGORY	UNIT	RATE OF FRESH AIR	
			TYPICAL RANGE	DEFAULT VALUE
	IDA 1	l.s. person	> 15	20
	IDA 2	l.s. person	10 – 15	12,5
IDA 3	l.s. person	6 – 10	8	
IDA 4	l.s. person	< 6	5	
<b>UNI EN 10339REV</b>				
CATEGORY	RATE OF FRESH AIR			
High	(l.s. per person) + (l.s. per m <sup>2</sup> )		Total fresh air volume varies based on the intended use of the confined area	
Medium	(l.s. per person) + (l.s. per m <sup>2</sup> )			
Low	(l.s. per person) + (l.s. per m <sup>2</sup> )			
not classified	not classified			

PERFORMANCE METHOD	<b>UNI EN 13779:2008</b>		
	<b>IDENTIFICATION AND QUANTIFICATION OF THE REFERENCE POLLUTANT (PM OR GAS)</b>		
	Concentration Limit	Minimum fresh air l.s. person	Quantity of recirculated air provided that it is filtered like fresh air
	WHO publicized values and legislative acts expressed in µg/m <sup>3</sup> , PPM, etc.	5 - 6	The volume of air to be considered is based on the internal production and the imposed concentration limits in the confined area
	<b>UNI EN 10339REV</b>		
<b>IDENTIFICATION AND QUANTIFICATION OF THE REFERENCE POLLUTANT (PM OR GAS)</b>			
Concentration Limit	Minimum fresh air l.s. person	Quantity of recirculated air provided that it is filtered like fresh air	
WHO publicized values and legislative acts expressed in µg/m <sup>3</sup> , PPM, etc.	The minimum volume of air input varies based on the intended use of the confined area	The volume of air to be considered is based on the internal production and the imposed concentration limits in the confined area	

## Fresh air flow rates according to the performance approach

### UNI EN 13779:2008 and UNI 10339rev Standards

The example reproduced at the bottom of the page shows how, with adequate air filtering, it is possible to decrease considerably the quantity of fresh air to be brought into the environment (up to 3-4 times less); the thermal energy dissipated due to ventilation is in fact in direct proportion to the number of air changes, as indicated in the following equation:

$$Q_v = \Delta T \cdot \frac{R}{3600} \cdot D \cdot C \cdot Vol.$$

- Q<sub>v</sub>** = Thermal energy lost for ventilation - Watt
- ΔT** = Indoor-Outdoor difference (T) - °C
- R** = A.C.H.
- D** = Air density - Kg/m<sup>3</sup>
- C** = Specific air heat - J/Kg-°C
- Vol** = Room size - m<sup>3</sup>

## Construction features

The **Crystall** electrostatic filtering system consists of two parts: the first is a **plate type electronic active filter** and is fitted in the return air section of the cassette, while the second is an **electronic control and regulation board**, fixed on the structure.

All electrical connections are made during production. The installation of the SkyStar Sabiana cassette fan coil unit incorporating the **Crystall** electronic filter is therefore similar to that of a normal unit: the only difference is the installation height, for which the filter dimensions must be taken into account.

**Crystall** filters are not suitable for electric heater versions.

### Active plate type electronic filter

The filtering element consists of two sections: the first consists of electrodes and insulating elements, forming a self-supporting ionising frame, while the second consists of special light aluminium fins (collector).

The two sections are installed above the return air grille to make the extraction and maintenance of the filter easier.

Accessibility to sections to be cleaned is ensured by easy-open plastic closures.

The collector can be cleaned by washing with water and ordinary detergents or steam jets (please consult the maintenance manual for further details).

### Electronic board

Controls and regulates all functions of the electrostatic filter.

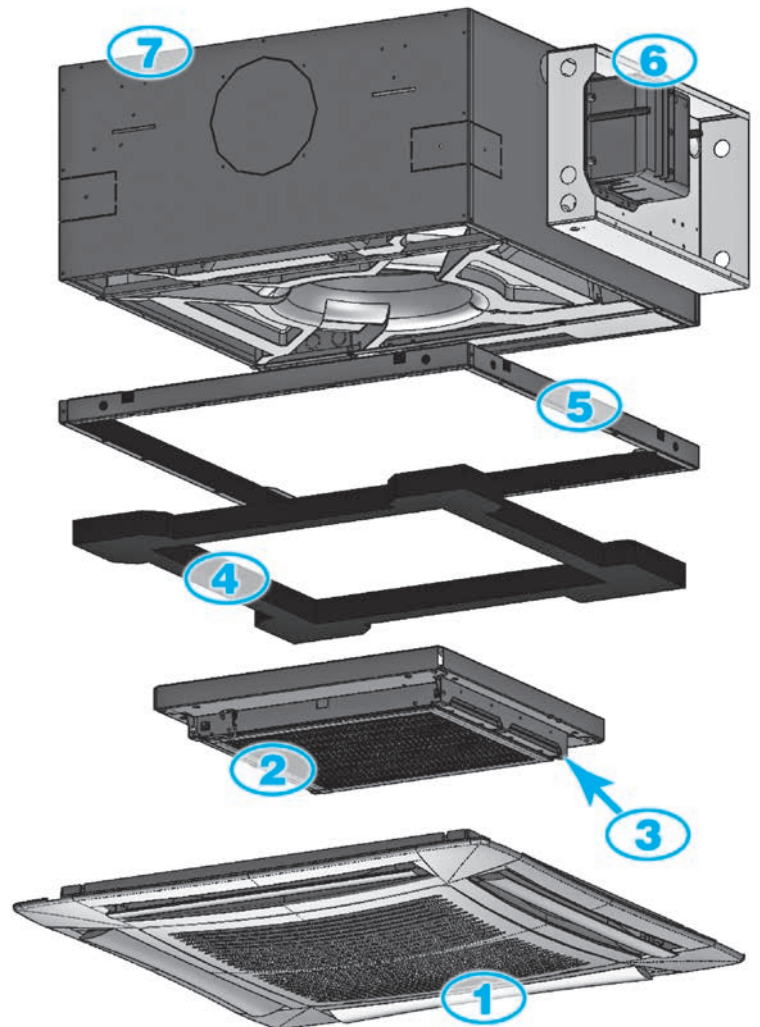
It is appropriately protected against any operating defects of the electrostatic filter. It supplies a constant voltage to the electrodes when the mains supply voltage varies ( $\pm 15\%$ ).

The supply transformer is constructed with its primary and secondary coils physically separated and wound onto separate cores.

The energy consumption of the filter group is 25 W (to which the electrical consumption of the Cassette must be added).

### Control and regulation commands

Units with **Crystall** electrostatic filter can be controlled and regulated by the series of **IAQ** controls that are already provided for CRC Carisma fan coils.



- 1 - Diffuser with return air grid
- 2 - Active plate type electrostatic filter
- 3 - Plastic opening
- 4 - Insulation
- 5 - Filter containment frame
- 6 - Electronic board
- 7 - Cassette