KLC®
KINGLANDCLEAN

USER MANUAL

ELECTRONIC AIR CLEANER

(AC SERIES)

Content

I Product description

Thank you for choosing KLC electrostatic air cleaner, also called as electrostatic precipitation (ESP filters). This product can effectively remove harmful substances in the air and provide a healthy, high-quality clean air environment. In order to ensure the effective operation of this product, please read this instruction manual carefully, keep it for easy reference during the application period

In order to ensure the safe and reliable operation of the product, please appoint a trained professional as the operation manager of the product. If there any questions or suggestions regarding maintenance and troubleshooting, please report to the administrator or contact KLC. We will wholeheartedly provide quality service!

1.1 Product overview and features

KLC electrostatic air cleaner is a kind of indoor air purification equipment that uses high-voltage electrostatic field to charge the dust particles in the air, and drives the charged particles tomove to the dust collectina electrode, there by being captured by the integrated board.

Features:

① Effectively capture dust particles as small as 0.01μm in the air, kill the microorganisms attached to the dust particles. The solid-state power supply maintains the high-efficiency and long-lasting filtration efficiency of the equipment.
② Ultra-low wind resistance and pressure loss, the resistance is only 12-38Pa, which greatly reduces the energy consumption of the system while ensuring the indoor air quality;
③ Low energy consumption, the maximum power consumption of a single unit is 31W.
④ Multiple units are assembly to meet the air volume requirements of the system;
⑤ Signal indicators for power, fault, cleaning;
⑥ Communication interface compatible to various building management system;
⑦ Pre-filtration for large particles collection in order to protect the ionization units.

2.2 Application

For commercial and industrial ventilation central air conditioning system; used in the pipes of air heating, refrigeration or ventilation systems to effectively remove particles >0.1 um in the pipes, provide passive signal contacts to connect with the building control system. Not suitable for flammable, explosive or dew condensation environments; ambient temperature should be within the range of -10~50℃.

2.3 Safety precautions

To avoid possible injury or property damage to yourself or others, be sure to read and keep in mind the following safety precautions.

WARNINGS	Violation of the following prohibited / mandatory actions may result in serious injury or death. Make sure to follow the rules! "◆" Prohibited actions ; "★" Mandatory actions

◆ 1. Forbidden to filter liquid particles flammable and explosive gases, coolant, fat, working fluid, wet or oily dust particles, etc., can cause short circuit, fire or electric shock.

◆ 2. Strictly prohibited from entering water. Or it will cause short circuit, arcing, internal damage to the appliance, fire or electric shock.

◆ 3. Strictly forbidden to carry out repair and maintenance when power on.

◆ 4. The ion box and metal mesh must be fully dried before installed and reset. Power on the equipment with water will cause continuous arcing, breakdown of plastic insulation, fire or electric shock.

◆ 5. Do not turn on the power until the installation is complete. Electric shock accidents and misoperation of electrical wiring will cause equipment damage and personal casualties.

◆ 6. Strictly forbidden to open holes in the electric control part of the unit, avoid damage to the interior of the product, which will lead to fire or electric shock.

◆ 7. Do not disassemble or modify the electrostatic air cleaner without authorization. Unauthorized dismantling or modification will cause the whole equipment to malfunction or cause fire.

◆ 8. Strictly forbidden to put fingers or metal objects into the air cleaner when power on, or will result in electric shock or injury.

★ 9. The input power must be consistent with the voltage and frequency indicated on the nameplate. Wrong power supply will cause damage to the electrical appliance and cause fire accident. Must verify that all wiring of the air cleaner complies with local codes and regulations.

NOTICE

Violation of the following prohibited / mandatory actions may result in serious injury or death. Make sure to follow the rules!

"◆" Prohibited actions; "★" Mandatory actions.

★ 1. The main power supply end of the electrostatic air cleaner needs to be equipped with a suitable leakage protector. In order to protect wires against electric shock when leakage fault occurs, it can also be used for infrequent switching and starting of wires under normal circumstances.

★ 2. The standard power line load power CANNOT exceed 1000W.

★ 3. Do not run the machine without wind blow. It may cause the accumulation of ozone and consume energy.

◆ 4. Forbidden liquid particles to float into the electrostatic air cleaner which may cause electronic shock or fire

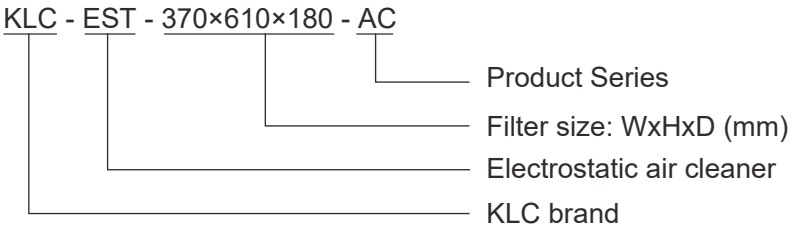
★ 5. The electrostatic air cleaner CANNOT be used in the outdoor environment. The product should be installed in a weatherproof structure such as a wind room.

★ 6. The air cleaner must be installed and maintained by trained and qualified maintenance technicians. It is recommended to contact a maintenance supplier with the qualifications.

★ 7. Allow sufficient maintenance space in front of the entrance to the dust chamber assembly. The minimum width of the inspection section is 600mm for workers to turn around during the maintenance process; the minimum reserved for inspection is 400mm×700mm, so that the pre-filter and the ion box unit can be taken out. Special models need to reserve maintenance space both at the front and the rear side.

Ⅱ Details

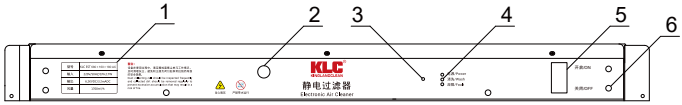
2.1 Standard models



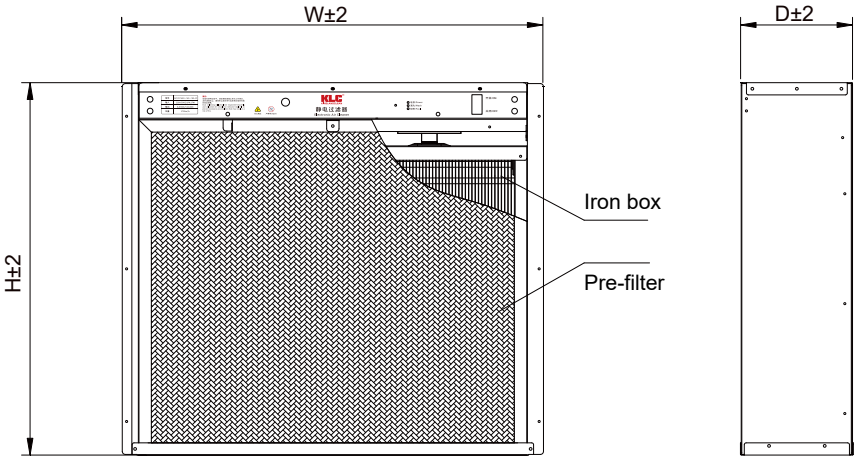
2.2 Parameters

Specifications	Standard model		Compound model	
	Single	Double	Single	Double
Input power	220V/50Hz/1PH		220V/50Hz/1PH	
Output	6.2KVDC/3.2m ADC		6.2KVDC/3.2m ADC	
Power consumption	17W	31W	40W	82W
Proper temperature	4℃ ~ 52℃		4℃ ~ 52℃	
Total weight	12KGS	18KGS	16KGS	25KGS

2.3 Control panel description



1. Parameter	2. Airflow sensor	3. Reset switch
4. Working light	5. Power switch	6. Power wire & signal wire



2.4 Model list

Models	W (mm)	H (mm)	D (mm)
KLC-EST-680×610×180-AC	680	610	180
KLC-EST-370×610×180-AC	370	610	180
KLC-EST-680×610×207-AC	680	610	207
KLC-EST-370×610×207-AC	370	610	207
KLC-EST-680×610×215-AC	680	610	226
KLC-EST-370×610×215-AC	370	610	226
KLC-EST-680×610×275-AC	680	610	275
KLC-EST-370×610×275-AC	370	610	275
KLC-EST-680×610×300-AC	680	610	300
KLC-EST-370×610×300-AC	370	610	300

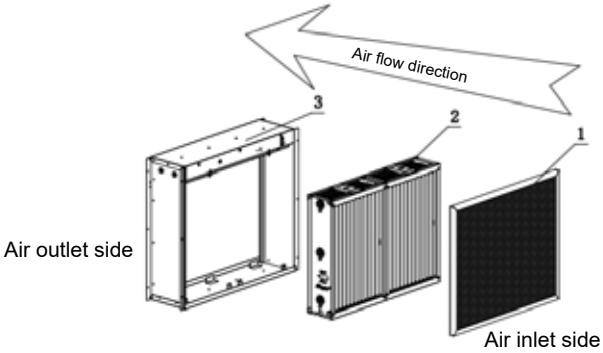
KLC-EST-370×610×300-AC	370	610	300
KLC-EST-370×622×312-AC	370	622	312
KLC-EST-680×622×312-AC	680	622	312
KLC-EST-370×1126×312-AC	370	1126	312

2.5 Configurations

	Components
KLC-EST-680×610×180-AC	K2 Metal mesh filter
KLC-EST-370×610×180-AC	
KLC-EST-680×610×207-AC	K4 Metal mesh filter
KLC-EST-370×610×207-AC	
KLC-EST-680×610×215-AC	K2 Metal mesh filter+UV lamp
KLC-EST-370×610×215-AC	
KLC-EST-680×610×275-AC	K2 Metal mesh filter + UV lamp + photocatalyst
KLC-EST-370×610×275-AC	
KLC-EST-680×610×300-AC	K4 Metal mesh filter + UV lamp + photocatalyst
KLC-EST-370×610×300-AC	

2.6 Structure

1. Metal mesh pre-filter
2. Ion box unit
3. Housing



III Installation Instructions

3.1 Unpack inspection

Check carefully whether the outer and inner packing are damage or not. If any damages, please claim to the logistic transit.

Attention: Deformation of the air cleaner will cause safety hazards.

When taking the electrostatic air cleaner out of the carton box, please wear protective gloves to avoid being scratched by sharp edges. The filter is heavy, better to have two people for the process. It is recommended to place the air cleaner horizontally when storage.

Note: Do not drag the signal wire and power wire at both ends of the device when removing the electronic air cleaner

3.2 Installation Position

3.2.1 Electrostatic air cleaner are not designed for outdoor use, the system should be installed in a weather proof structure such as a wind house or in a closed room.

3.2.2 Do not install the electrostatic air cleaner upside down in case of the per-filter and ion box will fall off by gravity.

Attention:

- Heavy fall may result in personal injury or equipment damage.
- Must reserve at least 600mm maintenance space at air inlet side; and reserve at least 400x700mm as access port for facilitate the pre-filter and the ion box.
- For optional UV lamp model, the inlet and outlet air surface need to reserve at least 800mm for maintenance space.
- Pay attention to the airflow direction during installation.

3.3 Installation design requirements

Series of units can be installed side by side and stacked in a row in order to meet client's large area

requirement. Layout quantity of equipment and installation location of each equipment is required.

3.3.1 Framework installation

According to equipment quantity and installation layout to install support frame for the electrostatic air cleaner, provide enough structure support to avoid collapse.

Attention: Collapse may result in personal injury or air cleaner damage.

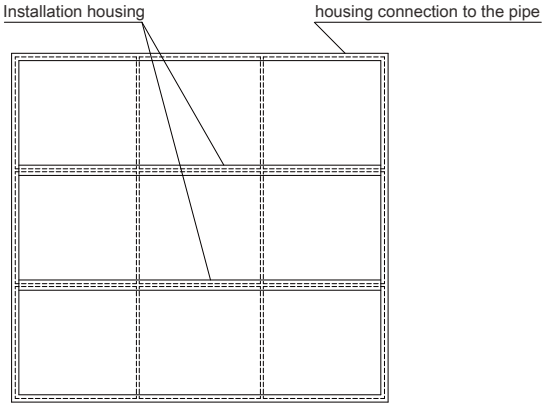
3.3.2 Wind pipe installation

When there is a risk of rain, snow, or debris entering the system, the fresh air intake should be provided with rain proof shutters, covers, or metal cloths to protect the electrostatic air cleaner.

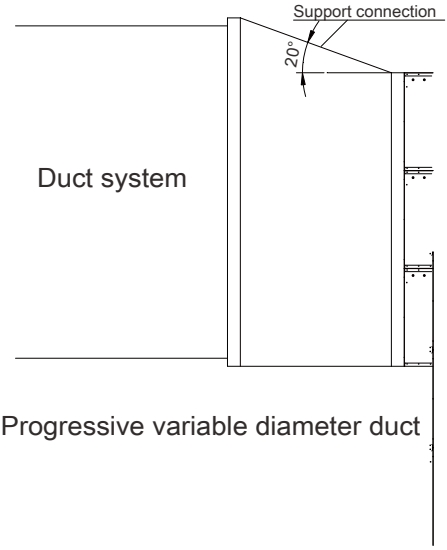
To purify the air most effectively, the air must be evenly distributed to the electrostatic air cleaner. If wind pipe size is different from the AHU, it is suggest to design transit wind pipe.

Transit wind pipe can reduce airflow disorder and increase effectiveness, the angle of the transit wind pipe shoud be ≤20°, and extend 1 meter wind pipe from every 3 meters' distance.

Note: The installation needs to ensure the sealant between the unit and the air duct in order to prevent air leakage.

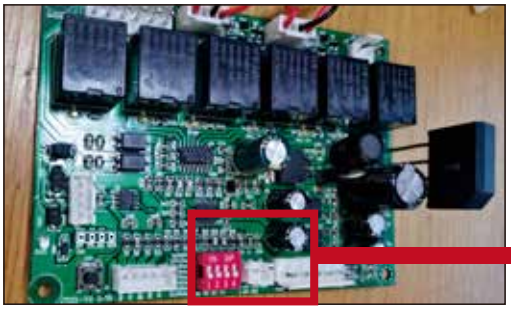


The unit bracket

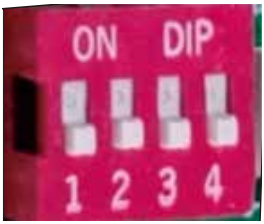


Progressive variable diameter duct

3.4 Clean time settings

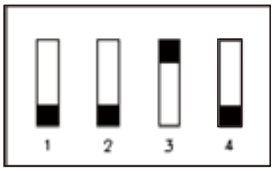


Open the electrical fixing plate;

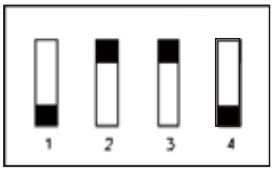


DIP switch

Cleaning time setting

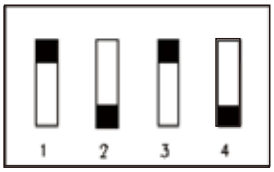


001=25days

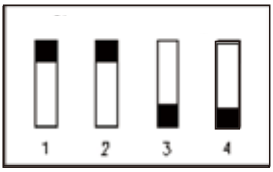


011=50days

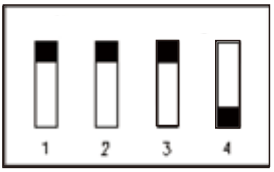
100=75days



101=100days



110=125days



111=150days

Cleaning alarm settings and display status:

① 6 ranges are available: 25days, 50days, 75days, 100days, 125days, and 150days.
② Referring to the position of the button above and adjust the fluctuation button to set the cleaning alarm period.
③ There's a LED green light, it's flashing times in 8 seconds represents the setting time divided by 25
④ Positiion 4 stands for the on/off setting of the wind speed sensor.
⑤ The default setting is 111=150 days.

3.5 Assembly

To install the external frame of the air cleaner, first need to take out the pre-filter and the ion box.

Pre filter disassembly:

Step 1: Rotate the buckle

Step 2: Pull out the air filter

Ion box disassembly:

Step 1: Open the bottom buckle

Step 2: Spin out the top of the ion box

KLC electrostatic air cleaner are designed with flange edges, it can easily form a row of up to 6 units connected by M4*8mm tapping screws. Before the installation, connect the external power wire and signal wire on the side of the unit with the external lead corresponding to the adjacent unit.

External lead connection

The connection of adjacent units

Rows of unit modulars can be stacked to fit the size of the AHU. Use M5*10mm pan head screw to lock and connect the upper and lower modules to the outer frame roof and bottom plate, so as to fix the upper and lower adjacent modules. If the upper and lower layers of the unit share the same power supply, the side unit's external power wire and signal wire can be connected together. Only install the ion box and pre-filter after the housing were installed.

Attention:

1. It is strictly forbidden to open holes on the electric control part of the unit in order to avoid internal damage to the electrical appliances.
2. If there are a large number of units, the units should be fixed to the designed supporting frame to prevent from collapsing.
3. Optional photocatalyst model, photocatalyst needs to be installed and maintained from the air outlet side.

The connection between the upper and lower frames

The upper and lower lines are connected

3.6 Ion box and Pre-filter reset

3.6.1 Install ion box

① Place the ion box upwards and towards the worker;
② Tilted the ion box towards the workers, load the botton into the housing.
③ Push in the ion box and make sure it is contacted to the election plate

Operation procedure:

Step 1: The ionization wire facing to the worker

Step 2: load the bottom of the ion tank into the housing

Step 3: Push the ion tank into the housing

Step 4: Install the barb buckle

3.6.2 Install the pre-filter

The slot between the limit block and the outer frame of the ion box is used to install the pre-filter. Load the bottom of the pre-filter into the slot firsth, then push the filter in and unlock the buckle at last.

3.7 Sealing

To ensure the efficiency of the air cleaner, the air must pass through the electrostatic filter completely. Blind plate should be installed around the unit to block airflow. When the blind plate is fixed with the air handing unit, sealing strip can be filled in the gap. The connecting gap between the upper and lower parts of the unit can be sealed with sealant glue.

Install the blind flange

Seal the gaps between the mounting frames with sealant

IV. Electrical wiring

Connect to the correct power supply

4.1 Wiring

① Determine which end of the installed electrostatic air filters is the most convenient for wiring operations;

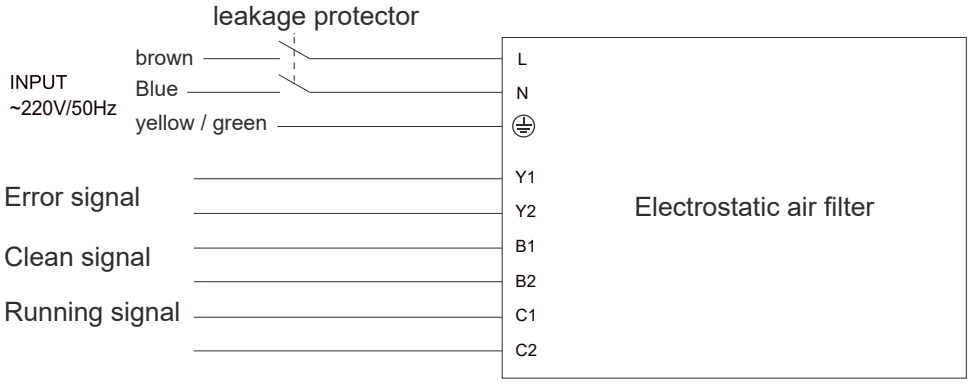
② Lead the power wire and signal wire of the electrostatic filter at the end of the loop out to the AHU. The standard power cable of the electrostatic air cleaner is 1mm², and it is recom mended that one loop should not exceed 1000W;

③ Outside the AHU unit, optional to install a 168mmx132mm junction box;

④ Lead the wires properly to the junction box then connect it to the external power supply and signal wires;

⑤ After wiring, cover the junction box.

Suggestion: Install proper leakage protectors for the external power supply terminals based on the number of electrostatic air cleaner in the unit. The maximum size of the power cable connected to the terminal of the junction box is 2.5mm² copper core wire.



Circuit diagram of leakage protector

4.2 Detection

4.2.1 Installation inspection

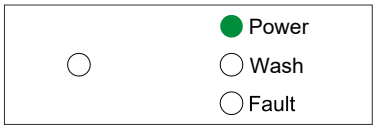
① The connection between the unit and the air duct should be competely sealed;
② All plates have been connected.
③ Add sealing strip for large gap;
④ Use outdoor fresh air, if conditions permit, it is recommended that the airflow be mixed with the return air before flowing through the electrostatic air filter;

⑤ Electrostatic air cleaner's ion box and pre-filter must be clean and dry;
⑥ Check if the airflow direction of the electrostatic air cleaner is correct;

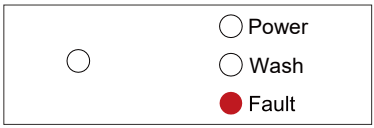
4.2.2 Electrostatic air cleaner unit operation inspection

After all components are installed properly, turn on the switch. If the Power (green indicator) is on, the Wash and Fault indicators are off, it is normal. If the operation is inconsistent with the above, please refer to the fault diagnosis diagram (P14).

Note: Before product commissioning, please keep the pipe clean. Large particles (such as soot, fiber particles, hair, etc.) may affect the normal operation of the air cleaner



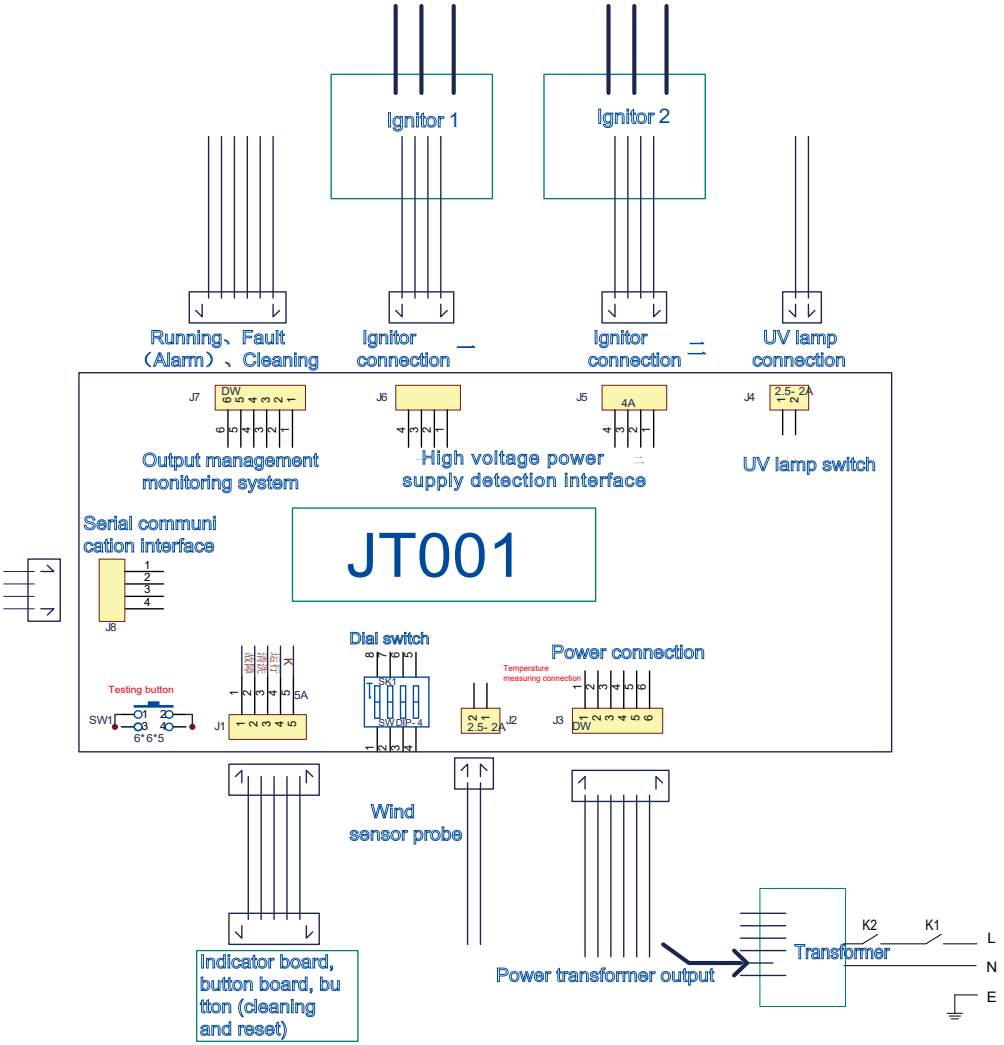
Normal operation



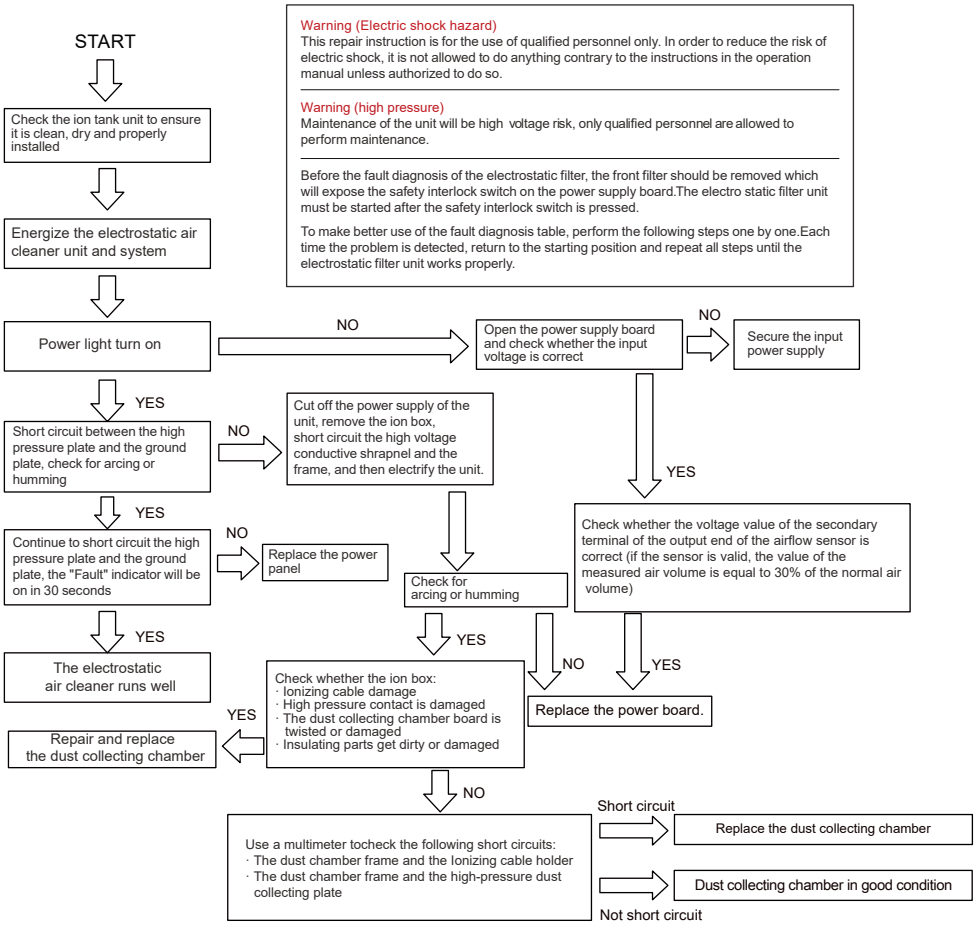
Fault Alarm

Fault (red light) refers abnormal working status.

Standard electrical wiring diagram
(see next page)


Ignitor 1
Ignitor 2
Running、Fault
（Alarm）、Cleaning
Ignitor
connection
Ignitor
connection
UV lamp
connection
J7
DW
J6
J5
4A
J4
2.5- 2A
Output management
monitoring system
High voltage power
supply detection interface
UV lamp switch
Serial communi
cation interface
JT001
J8
Dial switch
Power connection
Temperature
measuring connection
Testing button
SW1
J1
5A
SW DIP-4
J2
2.5- 2A
J3
DW
Wind
sensor probe
Indicator board,
button board, bu
tton (cleaning
and reset)
Power transformer output
Transformer
K2
K1
L
N
E

Fault diagnosis diagram

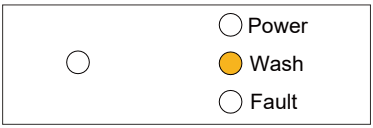


V. Repair and maintenance

Attention: Before repair and maintenance, remember to confirm the electrostatic air filter is power-off, please wear protective gloves to avoid being scratched by sharp edges.

5.1 Regular maintenance

The ion box unit and filters need to be cleaned regularly to keep the electrostatic air cleaner function properly and get the best performance. The cleaning cycle can be set according to the on-site working environment or according to user's experience, the cleaning (Wash) indicator will lights up to prompt cleaning.



Cleaning indicator

Trigger the cleaning reset switch

5.2 Cleaning operation

Attention: The ion box and pre filter should be fully dried before putting back into the housing; the ion box unit must be cleaned first, then to clean the pre-filter to avoid fibers, lint, etc. on the pre-filter from entering the ion box.

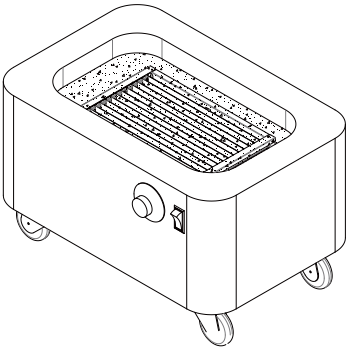
Cleaning process:

① Pay attention to the water temperature to avoid burns; do not splash the detergent solution into the eyes.

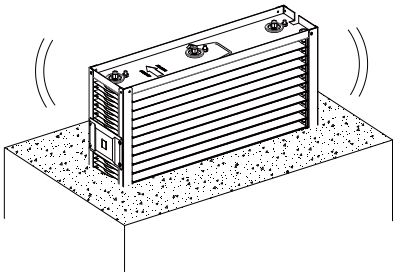
② Wear rubber gloves to avoid prolonged touching the detergent solution.

③ Keep detergents and solutions out of the reach of children.

④ Each ion box unit in the electrostatic air cleaner has a corresponding number. During the cleaning process, try to keep the holds the one-to-one correspondence between the ion box and the housing. It is recommended to use ultrasonic cleaning equipment with ultrasonic frequency at 40KHz; and cleaning water in temperature 40~45℃.

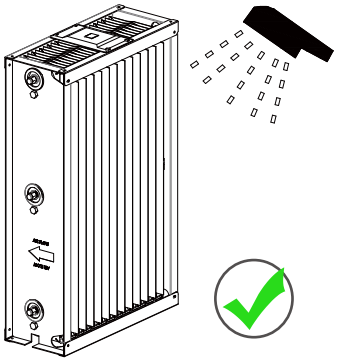


Ultrasonic Cleaning

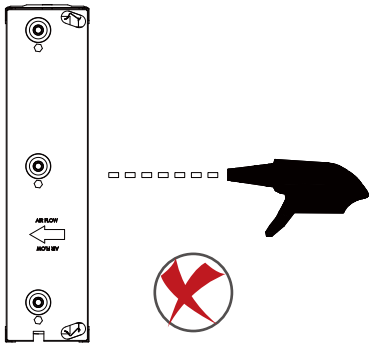


Soak in water and rinse

⑤ After cleaning the ion box, clean the pre-filter in the solution; soak and rinse with clean water after cleaning; Or rinse the ion box and pre-filter with water, thoroughly rinse the ion box to remove all dust and fibers until the water from the rinse is no longe cloudy;



Rinse ion box



Do not flush the ionization wire with high pressure water

Note: Do not spray water directly on the ionization wire with high-pressure water to avoid stretch, deform or break;

⑥ Place the rinsed ion box in a ventilated place and dry it for two hours. If it cannot be fully dried, the time should be extended (if permit, auxiliary equipment such as drying or air drying can be used to shorten the time of natural drying. If use air drying method, please do not blow directly towards the ionization wire).

After cleaning, the aluminum ion box dust collecting plate has a slight fade. This is a normal chemical reaction between aluminum and detergent, which will not damage the unit or affect the performance.

Note: for detailed cleaning instructions, please contact after-sales services.

5.3 Reset installation

Before reset, please check the the followings

① Make sure the ion box and pre-filter are fully dried

② Whether the ion box is deformed
(deformed ion box units cannot be used continuously);

③ Whether the ionization wire is loose or broken
(any loose or broken ionizationwire should be replaced in time);

④ Whether the spacing between the plates is even
(obvious uneven spacing needs to be adjusted);

⑤ If the nuts on both sides are loose, they need to be re-tightened

5.4 Airflow sensor maintenance:

The electrostatic air cleaner equipped with airflow sensor can be shut down timely and reliably when there is no airflow passing through. The airflow sensor is installed inside the device, a deflector cap is to guide the air flow through the sensor. When the electrostatic air cleaner is used in a dusty or harsh environment, a large amount of dust or fibers may adhere to the surface of the sensor, causing the sensor to fail to work properly. When cleaning the airflow sensor, remove the blackflow cap from panel and carefully wipe the sensor with a cotton swab dipped in rubbing alcohol. Or the sensor can be set to fail mode, the power supply of the electrostatic air cleaner unit can be linked with the power supply of the fan for controlling.

Air flow sensor

VI Replace faulty components

6.1 Ionzing wire replacement

The ionization wire is suspended in a support frame by a stable design tension. When an ionization wire is broken, the cleaner will continue to work .The broken ionization wire will cause a short circuit and lead to visible arc light or sparks. Continuous arc pulling will cause abnormal working and will trigger the fault signal. All loose and broken ionization wires should be immediately replaced upon discovery.If an ionization wire is missing, the unit will continue to work, but will reduce the filtration efficiency.

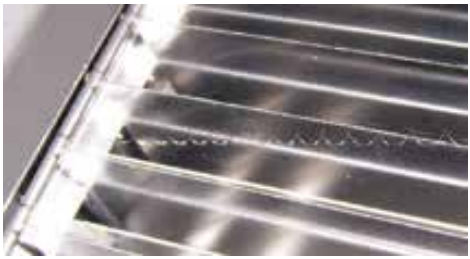
① After confirming that the ON/OFF switch is in the OFF state, remove the pre-filter and ion box unit from the housing;

② Clean up the residual part of the broken ionization wire in the ion box;

③ Put one end of the ionization wire into the slot of the ionization wire support frame, pinch the other end of the ionization wire with your thumb and index finger, stretch it to the position of the slot corresponding to the opposite;

④ Insert it diagonally from the bottom of the L-shaped bracket, clamp the ionization wire end clamp into the corresponding slot with the help of needle-nose pliers.

⑤ After the installation of the ionization wire is completed, the ionization wire should have sufficient tension to be self-supporting and still hang in the wire slot of the tungsten wire support frame,otherwise it needs to be replaced.

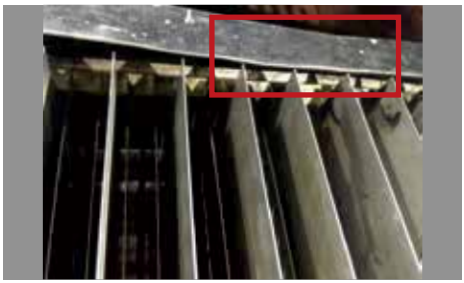


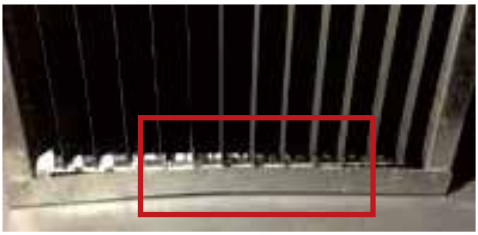
6.2 Ion box unit replacement

If the ion box is dropped or hit, it will cause deformation; the deformed ion box cleaner is likely to have uneven spacing between the plates, or the plates are bent and deformed.

Using the deformed ion box unit will affect the filtration efficiency if abnormal arcing occurs, the air cleaner will not work normally, and trigger fault alarms.

If the ion box unit is seriously deformed, it needs to replace the ion box with a new one. If the deformation is slight, it can be repaired manually with pliers, If icannot be repaired, it needs to replace the ion box with a new one.





Ion box deformation

Uneven spacing of ion plates

6.3 UV lamp replacement

For the cleaner equip with UV lamp, please replace the lamp by referring to the following steps:

① After confirming that the ON/OFF switch is in the OFF state, remove the pre-filter and ion box unit from the unit;

② The UV lamp tube is reinforced with cable ties during transportation. When disassembling the lamp tube for the first time, need to cut off the ties reinforced at the upper and lower ends;

The base
is firmly fixed

③ The lamp tube is fixed by two elastic buckles at the top and bottom, first disassemble the lower buckle, then the upper buckle, and finally pull out the lamp wiring;

Remove the lower light buckle

Remove the upper light buckle

Unplug the light cord

④ The UV lamp installation sequence is opposite to the disassembly, connecting the lamp wire first, then install the upper buckle, and finally install the lower buckle;

Connect the light tube

Install the upper buckle

Install the lower buckle

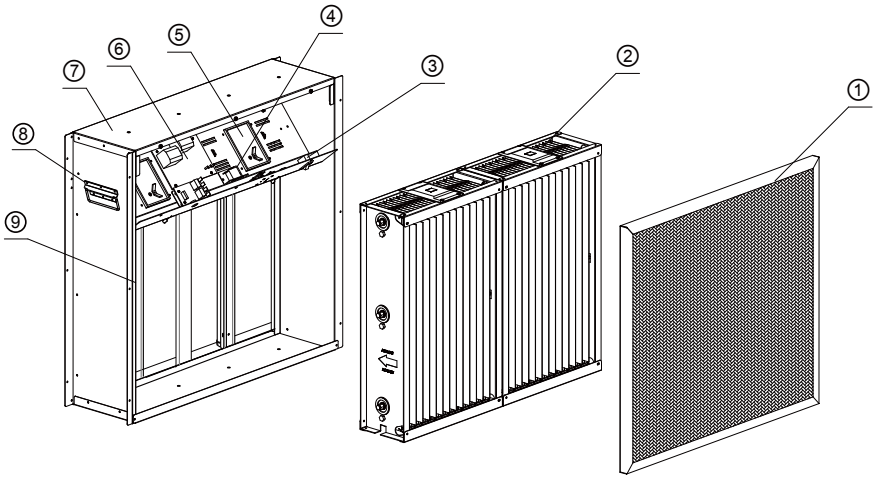
VII Transport and storage

The electrostatic air filters are packed in carton box, stacked on pallets, and wrapped with polyethylene film. During handling and storage, there should be no strong impact, and should not be exposed to water drenching or splashing to avoid damage and rust.

When transporting, the corresponding lifting tool should be selected according to the weight of the pallet.

VIII Appendix

8.1 Schematic diagram of Standard model



① Pre-filter ② Ion box ③ Power switch ④ Safety interlock switch

⑤ High voltage contact plate ⑥ High voltage circuit board

⑦ Housing ⑧ Handle ⑨ UV lamp