

SAAF™ ESP – Electrostatic Precipitator

INSTALLATION, OPERATION, AND MAINTENANCE INSTRUCTIONS

Table of Contents

1.0 Safety Precautions

2.0 Introduction

- 2.1 About this document
- 2.2 Principle of operation
- 2.3 Product components

3.0 Installation Instructions

- 3.1 Installation guide
- 3.2 Common mistake on installation
- 3.3 Airflow direction
- 3.4 Method for reversing airflow direction
- 3.5 Other precautions

4.0 Operation

5.0 Maintenance

- 5.1 Collector cell cleaning
- 5.2 Troubleshooting

6.0 Appendix

- 6.1 Wiring diagram

1.0 Safety Precautions

Please familiarize with safety alert symbol show in this manual before using your AAF equipment.



High Voltage Warning

Isolate all electrical sources of supply before opening or removing the cover



Wear Goggles

Wear goggles to protect your eyes



Wear Mask

Wear mask to filter irritating odor



Attention

General attention symbol



Wear Glove

Corrosive, wear glove for protection



Ground

Grounding is a must to avoid risk of fire and electric shock

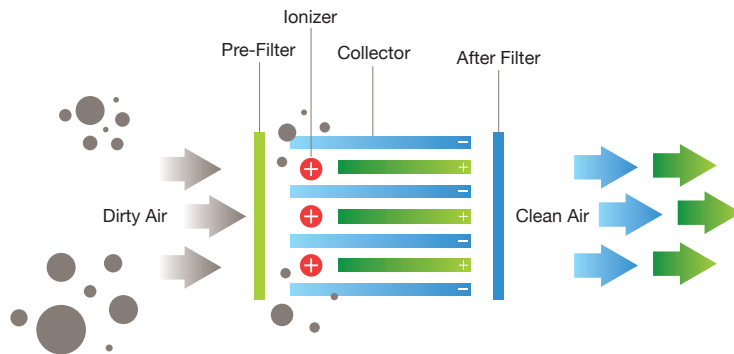
2.0 Introduction

2.1 About this Document

This document contains the information necessary to properly install, operate and maintain the SAAF™ ESP - Electrostatic Precipitator. The purchaser, installer and operator of this equipment MUST read and comply with this document in its entirety prior to installation of the equipment and its operation. Failure to comply with the requirements of this manual may void the equipment warranty.

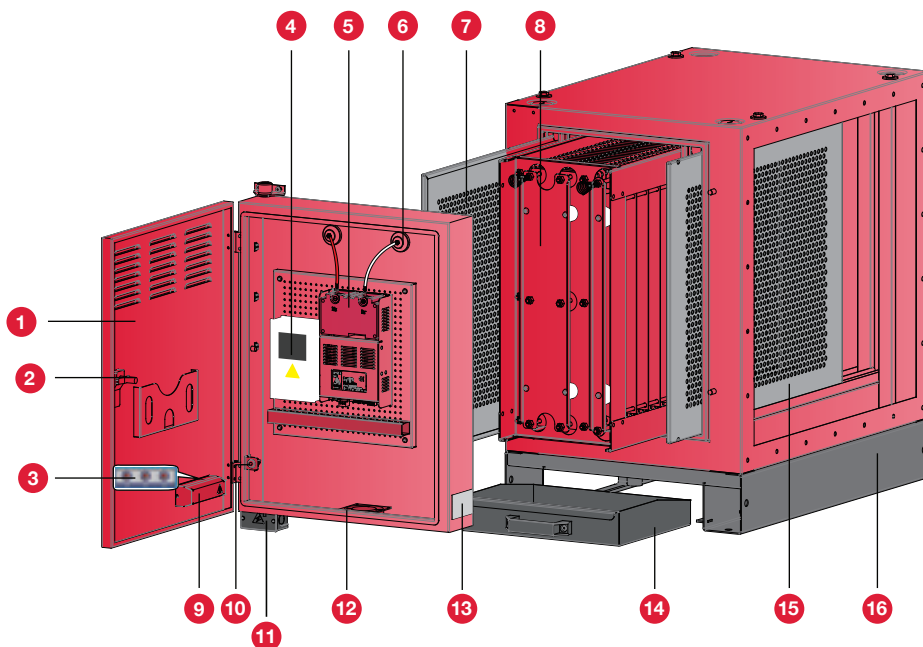
CAUTION: These instructions are specific to the SAAF™ ESP - Electrostatic Precipitator. All ancillary tasks including, but not limited to, electrical and mechanical work, equipment handling and safety procedures must be performed in accordance with industry accepted practice and all relevant local, state and federal government codes, laws and policies.

2.2 Principle of Operation



SAAF™ ESP - Electrostatic Precipitator is a two-stage electrostatic precipitator. The two stages consist of ionizer section and collector section. Ionizer section will charge the fine particles. These charged particles will then enter the collector section which is made up of parallel spaced plates. Each alternating plate is charged with the same polarity as the charged particles which will in effect repel the particles unto the other set of plates which is grounded. The particles will remain collected at the grounded plates until it is washed away.

2.3 Product Components



- 1. Control Panel Door
- 2. Door Lock
- 3. Indicator Light
- 4. Circuit Breaker

- 5. High Voltage Power Supply
- 6. Insulation
- 7. Distribution Plate
- 8. Collector Cell

- 9. Indicator Light Box
- 10. Safety Interlock
- 11. Wire Connector
- 12. Cooling Fan

- 13. Name Plate
- 14. Oil Sump
- 15. Protection Net
- 16. Base Frame

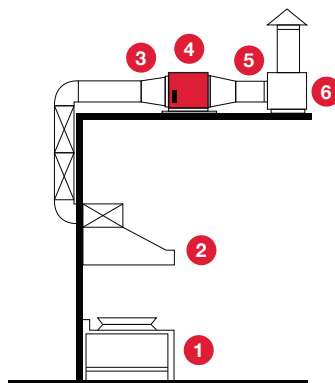
- Insert distribution plate **7** (round hole, will increase at least 100 Pa pressure resistance) at air entering side should the air distribution is not even due to improper ducting installation. Insert protection net **15** (hexagonal hole) at air leaving side.
- Take out distribution plate **7** (round hole, will decrease at least 100 Pa pressure resistance) and insert protection net **15** at air entering side when the air is distributed evenly.
- Manufacturing setting: Distribution plate **7** is installed at air entering side while protection net **15** is installed at air leaving side.

3.0 Installation Instructions

3.1 Installation Guide

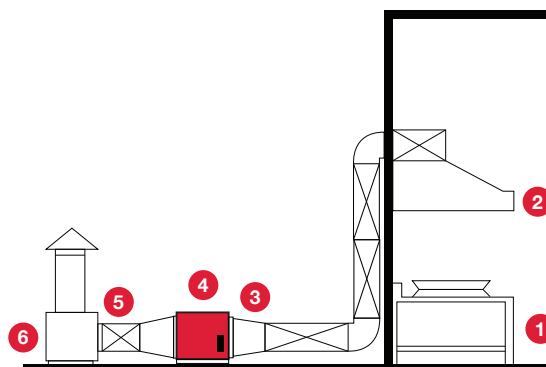
Rooftop Installation

Outdoor



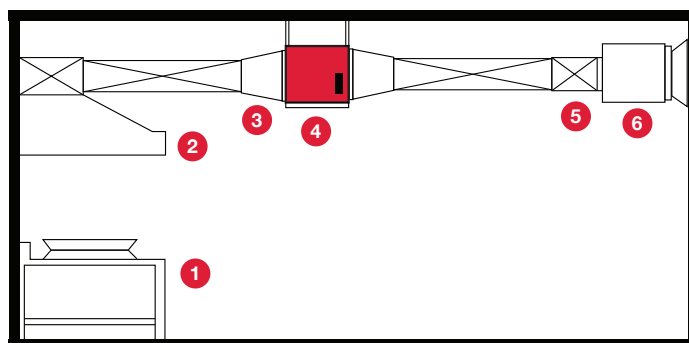
Floor Installation

Outdoor



Ceiling Installation

Indoor

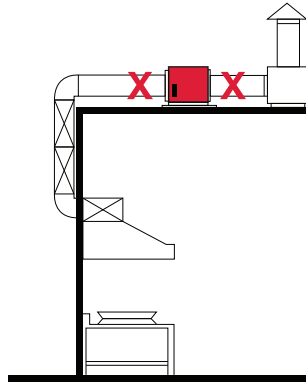


1. Kitchen
2. Hood
3. Reducer
4. Air Purification Unit
5. Flexible Coupling
6. Fan

3.2 Common Mistake on Installation

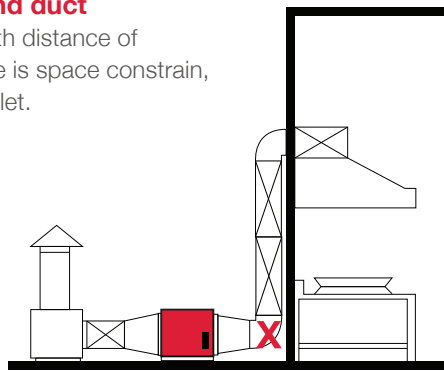
Reducer is not installed

Corrective Action - Install reducer



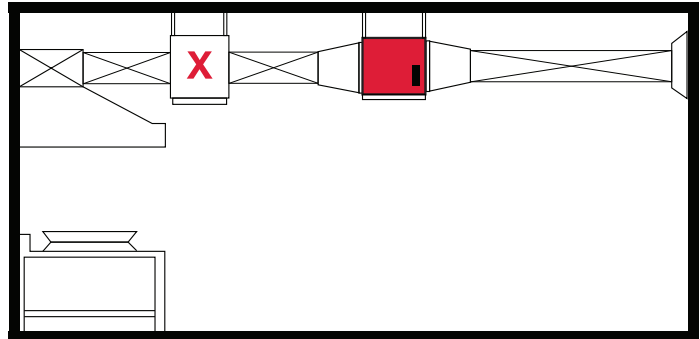
Straight duct is not installed after bend duct

Corrective Action - Install a straight duct with distance of $3\sim 4D$ at air inlet of air purification unit. If there is space constrain, suggest to insert air distribution plate at air inlet.



Fan installed before air purification unit

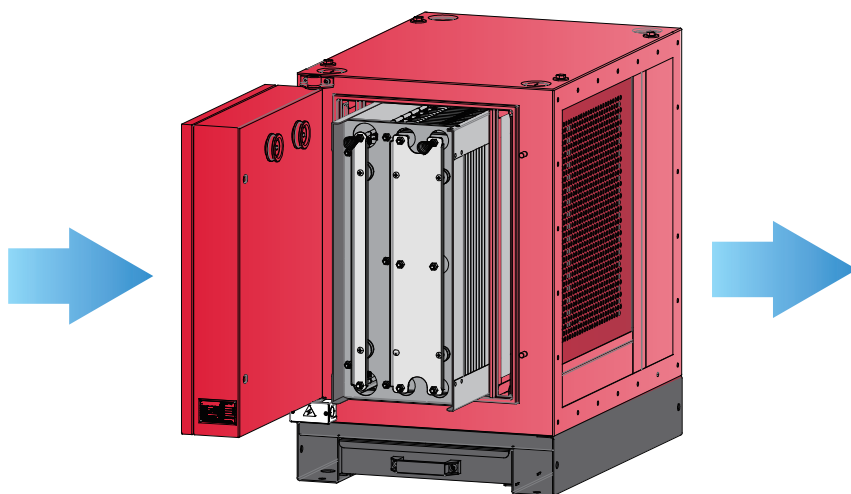
Corrective Action - Install fan after air purification unit



Note:

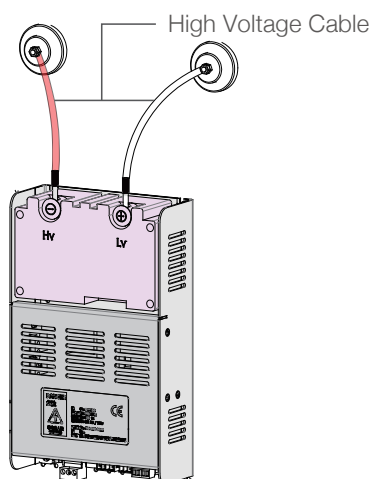
- 1) Cable diameter should be sized according to main circuit breaker (MCB) capacity.
- 2) The cable diameter for neutral line and live line should be identical. They should be connected properly.
- 3) Equipment should be grounded properly.

3.3 Airflow Direction



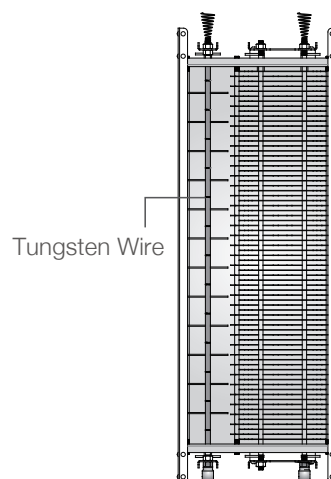
Note:

Default setting of airflow direction is from left to right



High Voltage Cable

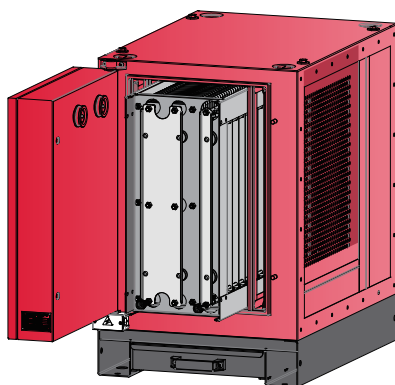
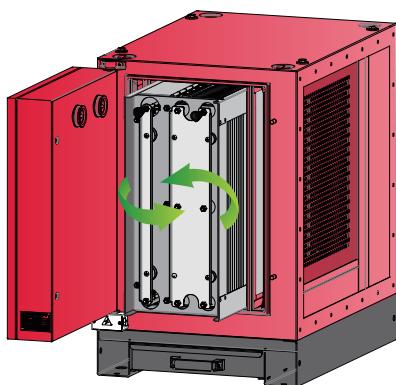
- Air inlet at left side - Left is red cable while right is white cable
- Air inlet at right side - Left is white cable while right is red cable



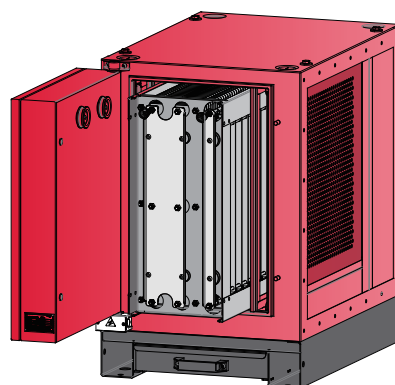
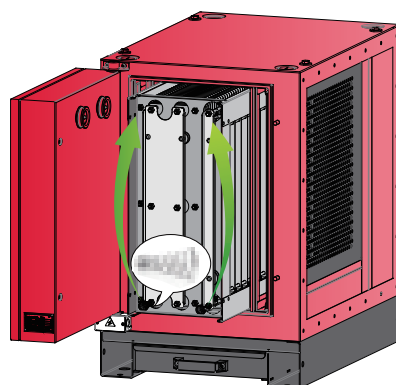
Direction of Collector Cell

- Air inlet at left side - Tungsten wire is at left side
- Air inlet at right side - Tungsten wire is at right side

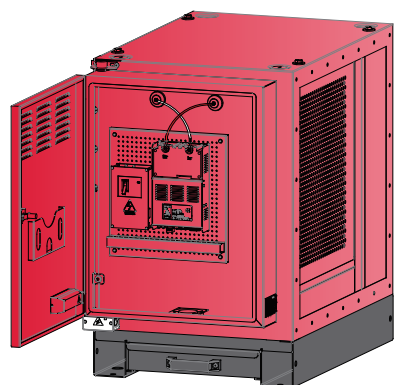
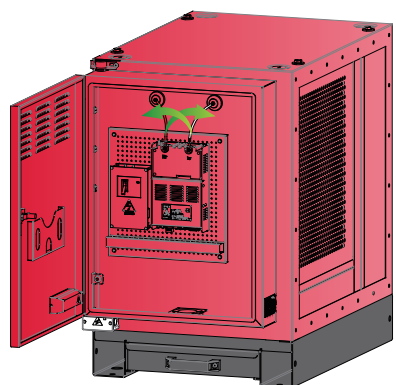
3.4 Method of Reversing Airflow Direction



1 Rotate the collector cell 180°



2 Move the spring and connector to top of collector cell

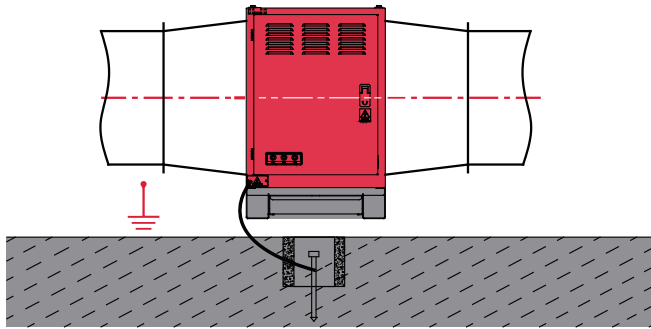


3 Swap the location of high voltage cable

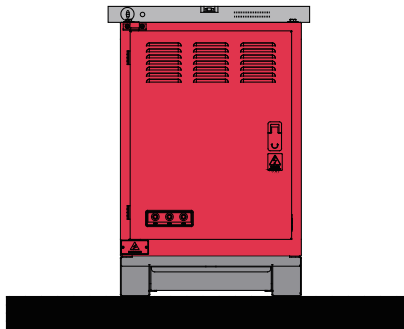
Attention!

Strictly follow the instructions to prevent any malfunction of equipment due to incorrect operation.

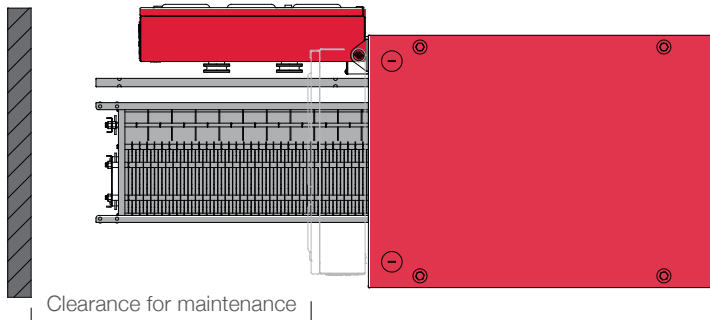
3.5 Other Precautions



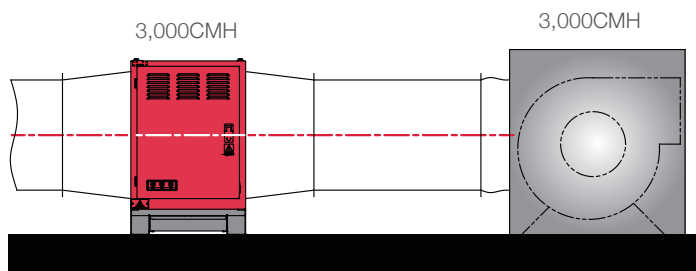
1 The equipment must be grounded properly



2 The equipment must be horizontally aligned.



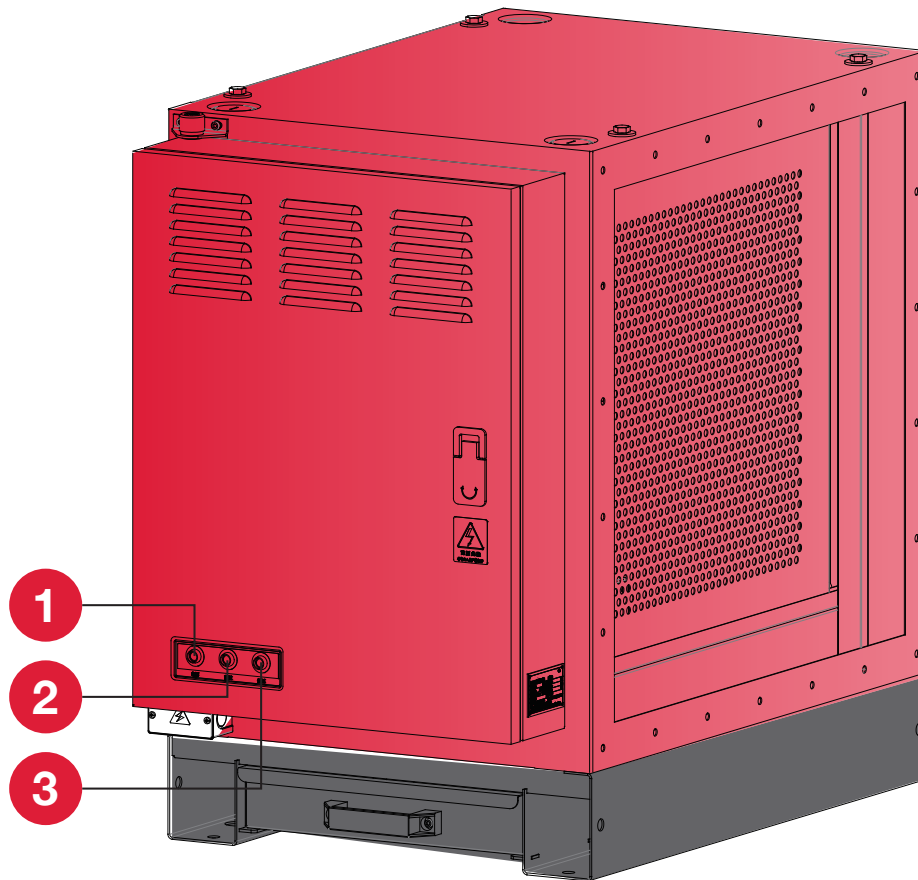
3 Reserved enough space clearance for access door to be opened during collector cell maintenance.



4 Airflow capacity for the equipment and fan should be identical

5. If the equipment is installed on a stand, it should be properly connected with the stand.
6. The gap between flange of the equipment and duct should be sealed properly.
7. Prohibited for non-trained personnel to dismantle, commission and service the equipment.
8. Any breakdown occurred, the power supply of equipment should be cut-off immediately and inspected by authorized service personnel.

4.0 Operation



1. On/Off light is on: High Voltage Power Supply is operating
2. HV light is on: Ionizer section is operating
3. LV light is on: Collector section is operating

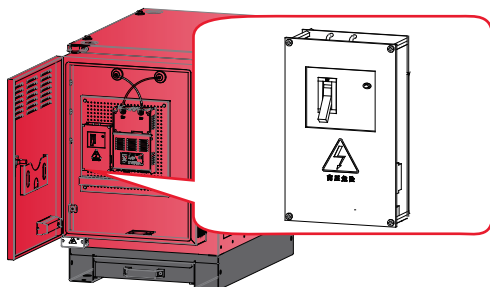


There will have a “siss” sound when power is turned on

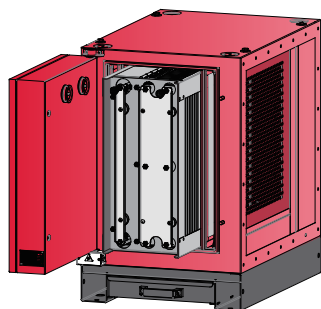
1. Check oil sump periodically.
2. Clean collector cell periodically to maintain equipment efficiency.
3. Clean collector cell immediately should below symptoms occurred.
 - Equipment efficiency has dropped and smoke is spotted after the equipment
 - Cracking sound is spotted frequently from the equipment due to electric discharge
 - HV light or LV light is flickering or dimmed for a long period
4. Check and wash distribution plate and protection net periodically.

5.0 Maintenance

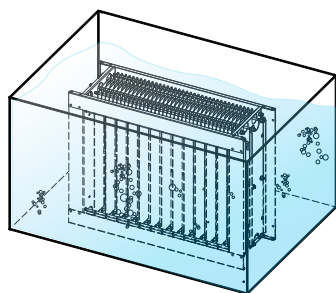
5.1 Collector Cell Cleaning



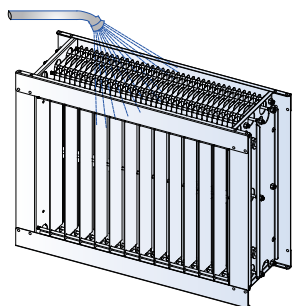
1 Open control panel and turn off the circuit breaker



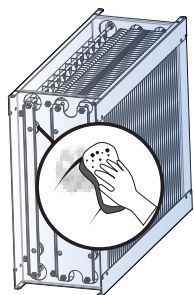
2 After 10 min of discharge, take out collector cell, distribution plate and protection net



3 Fully immerse the collector cell into diluted detergent for 3-5 min

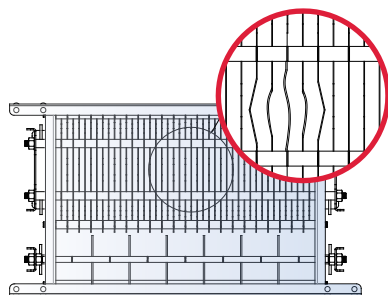


4 Rinse collector cell under running water

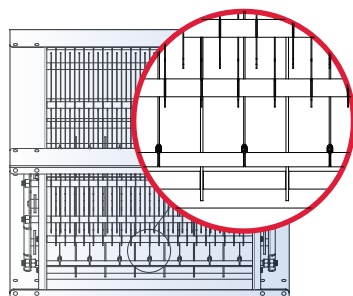


5 Wipe collector cell's insulation with dry cloth

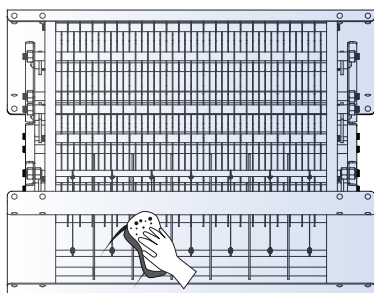
5.1 Collector Cell Cleaning



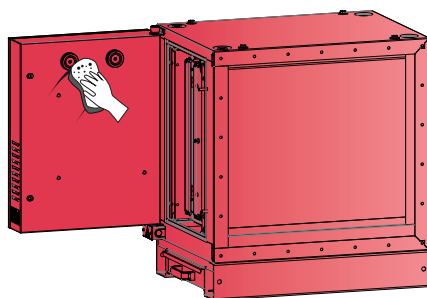
6 If collector cell has deformed, rectify it



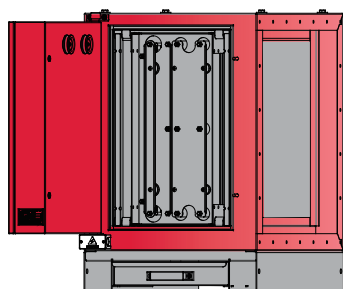
7 If tungsten wire has snapped or shifted, rectify it



8 Wipe tungsten wire should impurity is spotted



9 Wipe insulation on access door with industrial alcohol and let it dry



10 Assemble back and test run equipment

Reminder

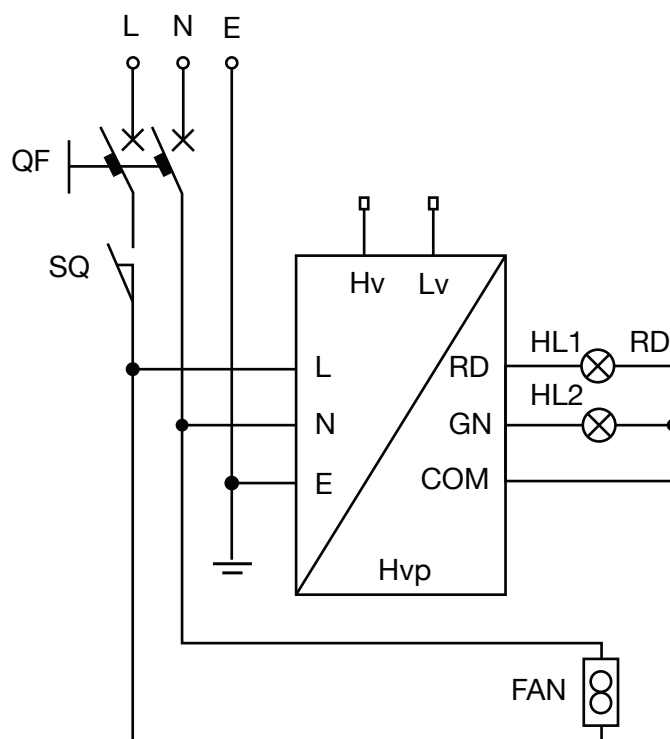
Wear goggles, safety shoes and anti-erode gloves during collector cell cleaning.

5.2 Troubleshooting

Problem	Possible Causes	Recommended Solutions
All indicator lights do not light on	Power supply has disconnected	Check power supply condition and rectify it
		Check wire diagram and connect back with power supply
	High voltage power supply has failed	Replace high voltage power supply
On/Off light is on while HV and LV lights are off	HV or LV of collector cell has short circuit	Check whether collector cell has deformed
		Check whether tungsten wire has snapped or shifted
		Clean debris in between cell plate
On/Off light is on while HV and LV lights are flickering	Collector cell is open circuit	Check the orientation of collector cell
		Check the spring and connector of collector cell is in position
		Make sure spring and HV connector is in contact
On/Off and HV lights are on while LV light is off	LV side of collector cell has short circuit	Check whether collector cell has deformed
		Clean debris in between cell plate
On/Off and LV lights are on while HV light is off	HV side of collector cell has short circuit	Check whether tungsten wire has snapped or shifted
		Check the condition of insulation
Cracking sound is spotted frequently due to electric discharge	Debris or impurity in collector cell	Clean debris in between cell plate
	Collector cell has deformed	Make good at the deformed area
	Dirty collector cell	Clean collector cell
	Loose connection on HV side	Re-insert the collector cell and check HV connector

6.0 Appendix

6.1 Wiring Diagram



MAM-ESPQ Series



Proven Expertise of AAF

We take pride in our commitment to providing the total solution for integrated airborne contamination control for food waste, helping home and building owners to solve their air quality problems. Talk to our sales team to learn more about how you can benefit from our clean air solution and also explore our product catalog to learn more or login to our website at www.aafintl.com for more detail information and solutions.

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