

ELECTROSTATIC PRECIPITATOR & ELECTROSTATIC PRECIPITATOR WITH TECHNICLEAN UV-C

PCL 5000 Module
PCL 7500 Module
PCL 5000/UV-C Module
PCL 7500/UV-C Module

**INSTALLATION, OPERATION
& MAINTENANCE**

**Grease, Odour and Smoke Control Unit
for Commercial Kitchens**



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THIS PRODUCT CONTAINS LAMPS THAT EMIT UV-C LIGHT. IMMEDIATE OR PROLONGED EXPOSURE TO UV-C LIGHT CAN RESULT IN PAINFUL EYE INJURY, SKIN BURN, PREMATURE SKIN AGEING OR SKIN CANCER.

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Congratulations on purchasing a Plasma Clean air purifier

Thank you for purchasing a Plasma Clean air purifier and we hope you will have many years of trouble-free service from this product.

Plasma Clean air purifiers utilise advanced air cleaning technology developed by the University of Manchester, UK. Unlike most products in the marketplace which simply mask the problem, Plasma Clean air purifiers act by effectively reducing odours and destroying microbes in the air, helping to dramatically improve air quality, leaving your environment smelling fresh and clean.

Before you start to enjoy the benefits of your Plasma Clean air purifier product, please read this manual carefully and in particular the Safety Precautions section. Once you have read the information, please keep this manual safe for future reference.

This manual covers the Electrostatic Precipitator PCL 5000 and PCL 7500 Module and the Combined Electrostatic Precipitator with UV-C PCL 5000/UV-C and PCL 7500/UV-C Module.

If you have any questions, please do not hesitate to contact your Plasma Clean representative, who will be only too happy to help,

Thank you,

The Plasma Clean Team

SAFETY

The manufacturer does not accept any liability for the damage to the product or personal injury caused by non-observance of the safety instructions in this manual, or by negligence during installation, use or maintenance.

Everyone working on or with the product must be familiar with the contents of this manual.

Always keep the manual with the product.

The user of the product is fully responsible for observing local safety instructions and regulations.

Safety Instructions & Warnings

Some of the following information will be repeated in the relevant sections of the manual. This section should be fully understood prior to operation of the equipment supplied.

- A technically competent person should install Plasma Clean equipment.
- The instructions in this manual are intended for guidance only and are not intended to form a training document.
- During normal operation this device carries very high voltages internally.
- The unit will store an electrical charge when it is switched off. Wait for a minimum of one minute prior to opening any access door on the equipment.
- When installing this equipment using the suspension eyebolts a second lock nut must be fitted on each eyebolt to lock it in place.
- When installing in an oil mist application a liquid drain trap must be fitted. Regular inspections of oil residue areas should be carried out. Failure to comply with this may result in flashover arcing or fire damage in extreme cases.
- This appliance must be connected to a true earth and isolated in accordance with EN60947-3
- The unit is fitted with a safety interlock device, which should not be disabled.
- Care should be taken when handling filters and cell unit as they may have sharp edges. In oil mist applications oil residue may make the filters and cells slippery and difficult to grip. Suitable PPE should be issued & worn.
- When cleaning / maintaining the equipment

suitable PPE / safety procedures should be supplied to the technician to ensure his / her safety.

- Use of non-approved detergent may damage your unit. Plasma Clean only recommend the use of TRI-DEX detergent on their units.
- This manual should be retained for future use. It contains recommendations that will ensure a long service life of the supplied equipment.

Working Safely with UV-C Light

Only approved personnel familiar with the assessment of hazards and risks associated with industrial electrical and ventilation equipment such as fans and air handling units should install, operate and maintain the product.

If the installer or user is unable to understand the information in this manual or has any doubt that a safe and reliable installation, operation and maintenance of the equipment can be assured, Plasma Clean or their representative should be contacted for advice.

Additional warnings and safety information relevant to specific operations are contained at the start of the sections to which they apply.



 **Ultra –Violet light in the C Band can damage the skin and eyes**

 **Personal Protective equipment must be worn and direct viewing must be avoided**

 **The effect of unprotected eyes is similar to that caused by an electric arc welding torch**

Access to the lamps is gained through an access cover on the front of the UV-C reactor. Care is to be taken to prevent unauthorized access of the equipment.

The ozone that is generated by the UV-C lamps is an irritant.

⚠ The unit must not be operated without the Kitchen Extraction Fan running

It is recommended to control the unit via a Plasma Clean Air Flow Interlock switch (please enquire) or directly interlock to the main fan control to ensure that the lamps do not operate if the extract system is not operating.

A class D rated MCB must be used for surge protection.

⚠ THIS MANUAL SHOULD BE CAREFULLY READ BEFORE STARTING

NOTE - STACKING TWO OR MORE UNITS

Two to four units (maximum) can be stacked and interwired either in the factory or on site. The units are to be sealed with silicone and bolted together ensuring that the drainage holes are aligned. A stacking kit is available, please enquire at the time of ordering.

SPECIFICATION: ELECTROSTATIC PRECIPITATOR

THE PREPARATION & INSTALLATION OF THE AIR CLEANER

The electrostatic precipitator is designed for the effective treatment of grease and smoke. When combined with UV-C, gaseous odours are also treated.

The unit has two stages of filtration:

- Mesh prefilters
- Combined ionizer and ESP collector cell to remove grease and smoke particles

Part 1 of this manual addresses the Electrostatic Precipitator

SPECIFICATION: COMBINED ELECTROSTATIC WITH UV-C

THE PREPARATION & INSTALLATION OF THE AIR CLEANER

The combined electrostatic precipitator with UV-C light technology is designed for the effective treatment of grease, smoke and gaseous odour.

The combined unit has three stages of filtration:

- Mesh prefilters
- Combined ionizer and ESP collector cell to remove grease and smoke particles
- UV-C filtration to remove residual grease particles and gaseous odour control through a process of photolysis and ozonolysis.

Part 1 of this manual addresses the ESP stage

Part 2 of this manual addresses the UV-C stage

Technical Specification Electrostatic Unit Only

Specification	PCL 5000	PCL 7500
Volume flow rate (95% efficiency)	4,420m ³ /hr	6,630m ³ /hr
Power	50W	66W
Dimensions	533H x 1086W x 635L mm	533H x 1574W x 635L mm
Weight	80 kg	120 kg
Power supply	230Vac/1 phase/50Hz	
Installation	Free Standing, Wall or Frame Mounted	
Airflow*	Horizontal, Right to Left or Left to Right	
Ioniser/Collector Output Voltage	12 kV/6 kV	
Number of cells	2	3
Collector Cell Weight	15 kg	
Controls	On/Off Switch with Indicator	
Pre-filter	Expanded Aluminum (460mm x 460mm x 22mm)	
Primary Filter	Electronic Ioniser/Collector Cell	
Power Supply	PWM Power Supply	
Efficiency	To 95% Based on D.O.P. Test Method to 99.75% for Double Pass (Calculated)	
General	Multiple Units Can Be Joined Together for Increased Volume or Efficiency	
Optional extras*	Suspension eyebolts – 4 Oil Drain – 1(must be specified at ordering stage)	

Technical Specification Combined Electrostatic with UV-C

Specification	PCL 5000 / UV-C6	PCL 7500 / UV-C8
Volume flow rate (95% efficiency)	5000 m ³ /hr	7500 m ³ /hr
Power	622 watts	846 watts
Power supply	230Vac/1 phase/50Hz / 3A Class D circuit breaker required	230Vac/1 phase/50Hz / 3A Class D circuit breaker required
Dimensions	533H x 1086W x 855L mm	533H x 1547W x 855L mm
Weight	105 kg	150 kg
Installation	Free Standing, Wall or Frame Mounted	
Airflow*	Horizontal, Right to Left or Left to Right	
Ioniser/Collector Output Voltage	12 kV/6 kV	
Number of ESP cells	2	3
Collector Cell Weight	15 kg	
No UV-C tubes	6	8
Lamp rack weight	10kg	12kg
Controls	On/Off Switch with Indicator	
Pre-filter	Expanded Aluminum (460mm x 460mm x 22mm)	
Primary Filter	Electronic Ioniser/Collector Cell	
Secondary filter	UV-C lamp frame containing 6 or 8 lamps	
Pressure drop	140 Pa (dirty filters)	
Efficiency	To 95% Based on D.O.P. Test Method to 99% for Double Pass (Calculated)	
General	Multiple Units Can Be Joined Together for Increased Volume or Efficiency	
Optional extras*	Suspension eyebolts – 4 Oil Drain - 1	

*These items must be specified at ordering stage

Related products – please enquire:

Air Flow interlock
Stacking kit
Drain sump nut and tubing

PART 1: ELECTROSTATIC PRECIPITATOR

I. PREPARATION FOR INSTALLATION

This manual should be carefully read before starting the preparation and installation of the air cleaner.

The installation should conform to all local ordinances associated with building codes and electrical codes required for the unit. Authorities having jurisdiction should be consulted before installation is made. If there are no local codes, the installation should conform to the National Electrical Code.

⚠ Factory designed access to all electrically charged high voltage components contain electrical interlocks for the safety of operating personnel. Any additional access that may be provided in the system, where there is access to high voltage, must be equipped with such interlocks. Interlocks are readily available from the factory.

For maximum air cleaning efficiency, your air cleaner should be located as specified by your Plasma Clean representative.

The unit can be either wall-mounted or chain-hung.

NEW UNIT INSPECTION

Immediately, upon receiving the unit, carefully examine the package for damage during transit. If the unit is damaged, contact the last carrier for claim filing and contact your Plasma Clean representative immediately.

While unpacking the unit, look for concealed shipping damage. If there is damage, it should be reported to the last carrier for claim filing.

OPERATION

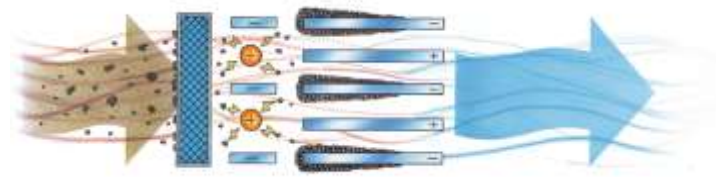
What is your Electronic Air Cleaner?

Your air cleaner is a high efficiency contaminant collector designed to remove up to 95% of the dust, smoke, liquid aerosol and other pollutants from the air passing through it.

HOW IT OPERATES

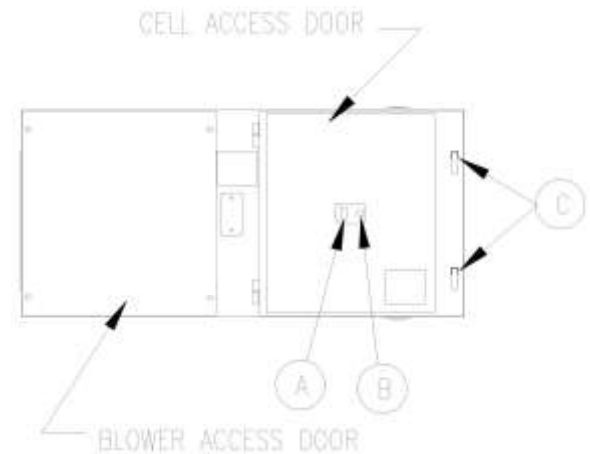
The PCL 5000 and PCL 7500 units require an external air handler to move the air.

After passing through a pre-filter, the particles in the air are given an electrical charge supplied by the power supply. As the particles enter the collector cells, these charged particles are attracted to and collected on grounded collecting plates.



Typical Electronic Cell Operation

UNIT OPERATION



Control Switch (A): The control switch is located on the cell access door. It controls the operation of the power pack. The control switch should be in the “OFF” position when the cell access door is open for maintenance of the unit.

Indicating Light (B): The light located adjacent to the control switch is an indicator of the performance of your electronic air cleaner. When the control switch is “ON”, the indicator light should glow. If the light does not glow or if it continually flickers and is accompanied with a continual snapping or arcing noise, the air cleaner requires attention and may need to be cleaned.

Cell Access Latches (C): The cell access latches are located on the door near the intake end of the unit. To open the cell access door, lift and turn the latches counter clockwise.

Arcing (snapping or cracking noise): An occasional arcing noise may be emitted from the air cleaner. This is a normal occurrence caused by exceptionally large pieces of dirt, etc., entering the collecting elements. In addition, an arcing noise accompanied by a flickering of the indicating light may be noticed after washing the cells. Should this occur, allow more drying time. Also, see “Troubleshooting Chart”, for additional causes of arcing.

The louvres on the grill are adjustable so the direction of airflow can be controlled as desired.

NOTE: The unit is equipped with an interlock switch for your safety. The unit will not operate if the cell access door is not closed securely.

DUCTING APPLICATION

To maintain the selected cleaning efficiency, it is important to ensure that the total air volume (capacity in CFM or m³/hr) is uniformly distributed across the entire face area of the unit. The metal mesh filters, perforated plate or mist suppressors provide some resistance to effect even air distribution. However, since most air ducts are designed to handle air velocities greater than the rated velocity of the air cleaner, it is necessary to properly transition any attached ducting. If possible, a contraction ratio of 1 in 3 (approximately 20°) should be maintained. If space prohibits, turning vanes, air baffles or other means may be utilized. Ducting – where attached to the cabinet collars – should be gasketed, caulked or otherwise made watertight.

II. INSTALLATION – READ THOROUGHLY

1. Carefully unpack unit from shipping crate or carton and examine for damage in shipment.
2. Remove ionizer/collector cell(s), pre-filters and after-filters.
3. Two to four units (maximum) can be stacked and interwired either in the factory or on site. The units are to be sealed with silicone and bolted together ensuring that the drainage holes are aligned. A stacking kit and stacking instructions are available, please enquire at the time of ordering.
4. Attach 500 pound (227 kg) test chain to the ceiling joist using:
 - a. Wood joist – 3/8" (m10) eye bolts
 - b. Metal joist – wrap chain around joist at least twice and secure with 500 pound (227 kg) test connecting link
5. Chain should be cut to allow the unit to hang from a predetermined height from the floor. (Usually 10-12 feet or 3.0-3.6 m).
6. The unit is equipped with a locator dimple in each corner on the top and bottom. Using the dimples as a guide, drill (4) 13/32" dia. (10.3 mm) holes that will be required for mounting the eyebolts, which are attached to the suspension chain.
7. Position a 3/8" (m10) diameter eyebolt (or larger) in each hole and secure with a washer and appropriate nuts.

NOTE: Be sure to place two nuts on each eyebolt to act a locking nut. Failure to do so may cause the nuts to loosen and the unit to fall.

8. Using 3/8" (10 mm) connecting links, attach unit to chain. Use turnbuckles on diagonally opposite chains.

NOTE: Foul threads on turnbuckles after leveling unit to ensure that the turnbuckle will not "back off" or loosen and cause the unit to fall.

9. The units can be suspended with the direction of airflow from the right to left. If a left to right airflow is desired, the unit may be flipped over and the eyehooks installed in what was originally the bottom.



LIQUID AEROSOL APPLICATION INSTALLATIONS

The unit is equipped with a sump, drain hole sized to accept a 1/2" NPT fitting.

For the collection of liquid contaminant:

1. Install drain fitting to allow for the attachment of a liquid collection cup or drain hose. A drain fitting is available from your representative. An "S" trap is required in the drain hose to ensure proper drainage of the collected liquid.
2. Raise the front corner of the unit, opposite of the drain corner, 1/2" (13 mm) to enable the collected liquid to flow to the drain sump.

Contaminants to be collected – such as oils in vaporous state – must be condensed into particulate form prior to entering the ionizing-collecting cells in order to maintain the anticipated efficiency. Gases, vapors or any non-particulate cannot be precipitated and will therefore pass through the air cleaner. Any condensing that takes place downstream from the air cleaner defeats the purpose. Similarly, heavy concentrations of water vapor, or other matter that becomes highly conductive when condensed, must be prevented from entering and/or condensing in the collecting elements to prevent electrical arc over and shorting.

ELECTRICAL INSTALLATION

All units must be wired directly in the junction box on the access door side of the unit. Use NEC Class I wiring methods. Size branch circuit protection in accordance with the NEC. Refer to the appropriate enclosed wiring diagram in the attached figures.

⚠ Exercise all the normal precautions when working with high voltage and comply with nec and all appropriate local codes.

Check Out for System Start-up

When the installation has been completed, assure that the equipment is ready for start-up by checking the following:

- A. All construction debris is removed from the ionizing-collecting cells, drain connections and ductwork.
- B. The drain line from the drain basin is clear and completely connected to its point of termination.
- C. Supply line power is available and electrical wiring is completed to the junction box.

III. MAINTENANCE

The following instructions are for use by qualified personnel.

⚠ WARNING - RISK OF ELECTRIC SHOCK
These serving instructions are for use by qualified personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

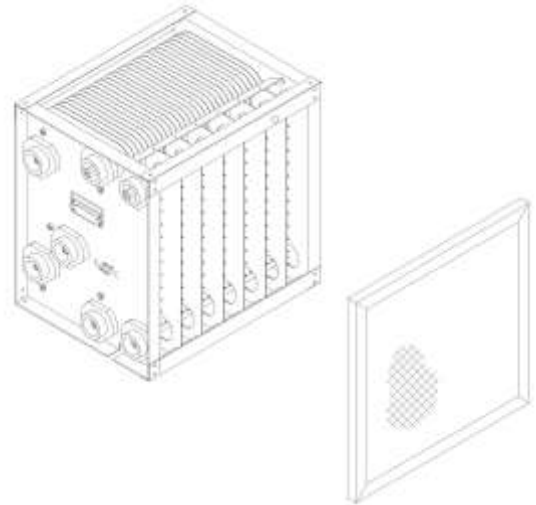
⚠ Factory designed access to all electrically charged high voltage components contain electrical interlocks for the safety of operating personnel. Any additional access that may be provided in the system, where there is access to high voltage, must be equipped with such interlocks. Interlocks are readily available from the factory.

CLEANING

To maintain optimum collection efficiency, the pre-filters and ionizer/collector cells should be removed periodically and soaked in a solution of hot water and Plasma Clean Tridex detergent for 2 to 4 hours, rinsed thoroughly and then air dried completely before reinstalling in the unit. The frequency of cleaning is dependent on the type of contaminant being collected. Liquid aerosol requires less cleaning while welding smoke may require more frequent cleaning.

⚠ Plasma Clean Tridex Detergent is specially formulated for use with Plasma Clean electronic air cleaners. Use of other cleaners and detergents, not specifically approved by Plasma Clean, can cause

possible failures in the unit and will void any and all warranties on our equipment.



WASH IONIZING/ COLLECTING CELLS

⚠ Do not use high pressure steam cleaning equipment to clean cells. The excessive heat and pressure will cause the plates to warp and in turn possibly cause excessive arcing.

1. Turn the control switch "OFF" and disconnect power to the unit.
2. Open the cell access door.
3. Remove ionizer/collector cells and wash in HOT detergent water. If the collected contaminant is of extremely dry nature, it can be blown off the cells with a pressure hose or by gently tapping the end plate of the cell.
4. Remove the mechanical pre-filter. Remove collected dust or lint by vacuuming or brushing. Wash with warm, soapy water.
5. Rinse all components thoroughly in warm, clear water and allow to drip dry completely.
6. Replace pre-filters and ionizer/collector cells. ENSURE the airflow arrows point in the direction of airflow (towards the blower).
7. Close the access door; reconnect power to the unit.
8. Turn control switch to "ON". If arcing occurs or the indicating light flickers, the components may still be damp. Turn the unit OFF and allow the cells to dry completely.

IV. REPLACEMENT PARTS ORDERING INFORMATION

The following pages contain exploded views and Bills of Material for the Plasma Clean Electrostatic Air Cleaners. Use these pages to determine the part numbers of the items needed. To order parts contact your local Plasma Clean representative and provide the following information:

- a. Unit Model number – located on the data label near the junction box.
- b. Part Number and description – from exploded views.

V. WARRANTY

All Plasma Clean Electronic Air Cleaners are warranted for 2 Year Limited Warranty on units and 1 Year Limited Warranty on replacement parts. Labor is NOT included. Do not return defective parts without permission from the factory and receiving a material return acceptance number.

VI. TROUBLESHOOTING GUIDE

PCL 5000 / PCL 7500

Problems and Possible Causes:

1. Indicating Light Out
 - a. Unit not plugged in
 - b. Control switch “Off”
 - c. Cell access panel not fully closed
 - d. Broken cell insulator
 - e. Extremely dirty cells
 - f. Service panel not secured in place
2. Excessive arcing noise after washing
 - a. Collector elements still wet – Allow more drying time
 - b. See “Continuous arcing noise” below
3. Continuous arcing noise and flickering indicating light
 - a. Extremely dirty collector plates
 - b. Bent collector plates
 - c. Large piece of material lodged between cell plates
4. Contaminant Bypass
 - a. Velocity of airflow is too high through unit
 - b. Collector plates not grounded
 - c. Collector cell not making solid connection to access door and high voltage contact.

IF PROBLEM CANNOT BE DETERMINED OR CORRECTED - CONTACT YOUR LOCAL PLASMA CLEAN REPRESENTATIVE OR CALL PLASMA CLEAN CUSTOMER SERVICE AT +44 (0)161 870 2325 FOR ASSISTANCE.



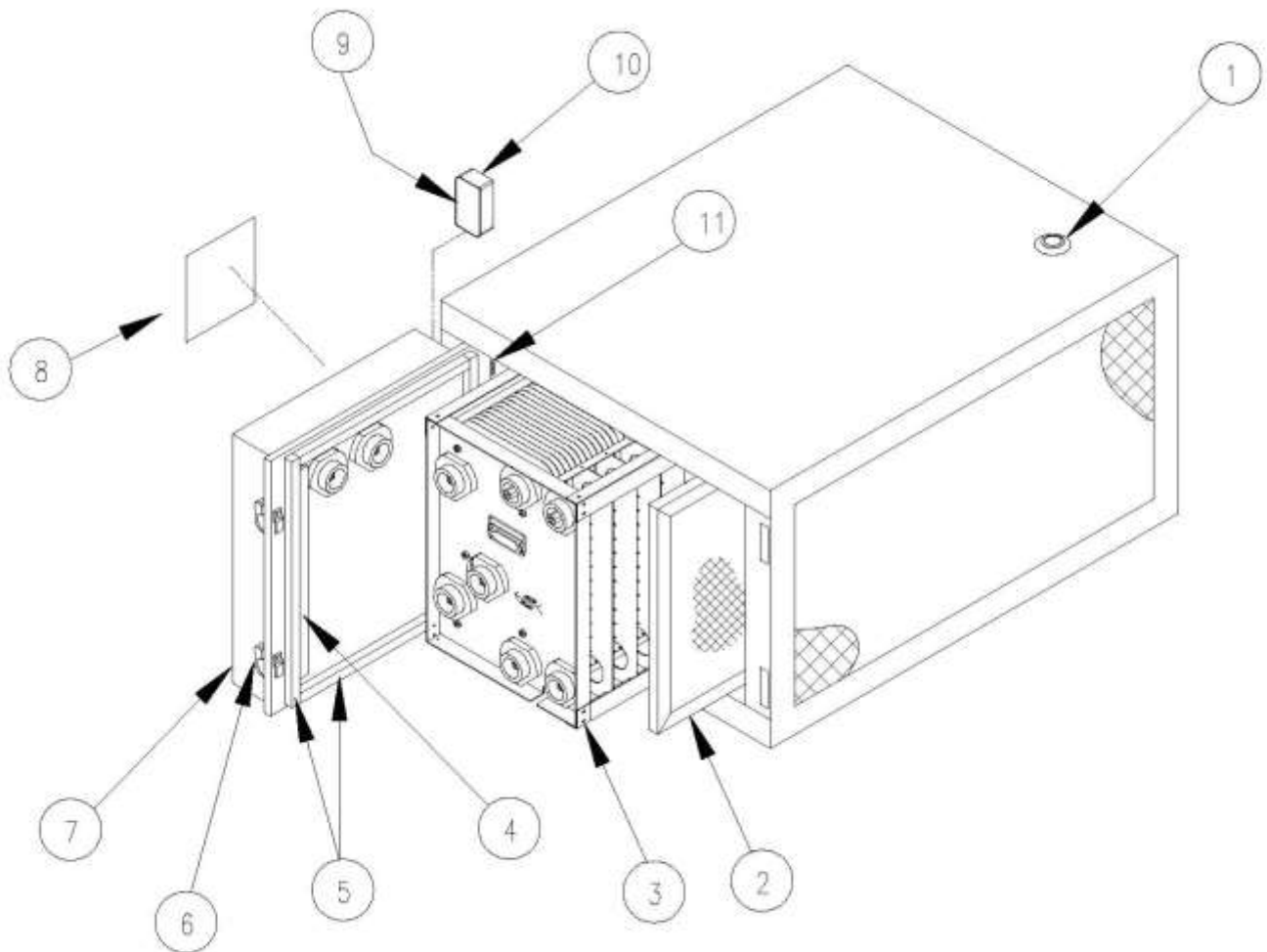
Factory designed access to all electrically charged high voltage components contain electrical interlocks for the safety of operating personnel.

Always unplug the unit while performing service within the cabinet.

VII - TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	CORRECTION
On / Off switch not illuminated	a) Check power supply to unit b) Control switch off c) Door not fully closed d) Fuse blown / cut out operated	a) Connect power b) Switch on c) Close door d) Change fuse / reset
Amber L.E.D out	a) Check on / off switch light, is on, if not b) Broken cell insulator c) Extremely dirty cells d) Power pack malfunction	a) Check on / off switch not illuminated b) Replace c) Wash cells d) Replace
Electrostatics not working	a) Excessive dirt b) Object between plates c) Damaged (bent) plate d) Damaged (bent) ionizer e) Broken insulator f) Defective power supply	a) Wash cells b) Remove c) Straighten or replace d) Straighten or replace e) Replace f) Replace
Power pack not working	a) No power supply b) Defective power pack	a) Check input to pack b) Replace
Unit will not work	a) No power at service connection b) Access panel not closed c) Bad (open) safety switch d) Bad (open) control switch e) Transformer (open) wiring f) Loose Wiring	a) Rectify b) Close c) Replace d) Replace e) Replace f) Repair
Heavy arcing after washing	a) Collector elements still wet	a) Allow more drying time
Continuous arcing and flickering indicating light	a) Dirty cell b) Damaged (bent) plates c) Damaged (bent) ionizer d) Large particle between plates e) Bad contact to cell / ionizer	a) Wash b) Straighten or replace c) Straighten or replace d) Remove e) Check
Loud hissing noise	a) Dirty cell b) Loose high-voltage connection	a) Wash b) Rectify
Stinging eyes	a) Unit blowing into faces b) Insufficient ventilation	a) Relocate & Adjust Vents (T1300 / T2600) b) Ventilate Work Area
Radio and / or TV interference	a) Improper earth connection b) Loose high-voltage connection c) Faulty suppression choke	a) Rectify b) Rectify c) Replace
Air not being cleaned	a) Cells not working b) Insufficient units c) Badly situated d) Pre-filter blocked e) Cell too dirty f) Inlet air too hot g) Air flow too great h) Inlet plenum too small i) Fault on electrostatics j) Excessive fume	a) Check as above b) Increase units c) Relocate d) Clean or replace e) Wash f) Pre-cool g) Slow air speed h) Modify i) Rectify (see above) j) Fit double pass unit

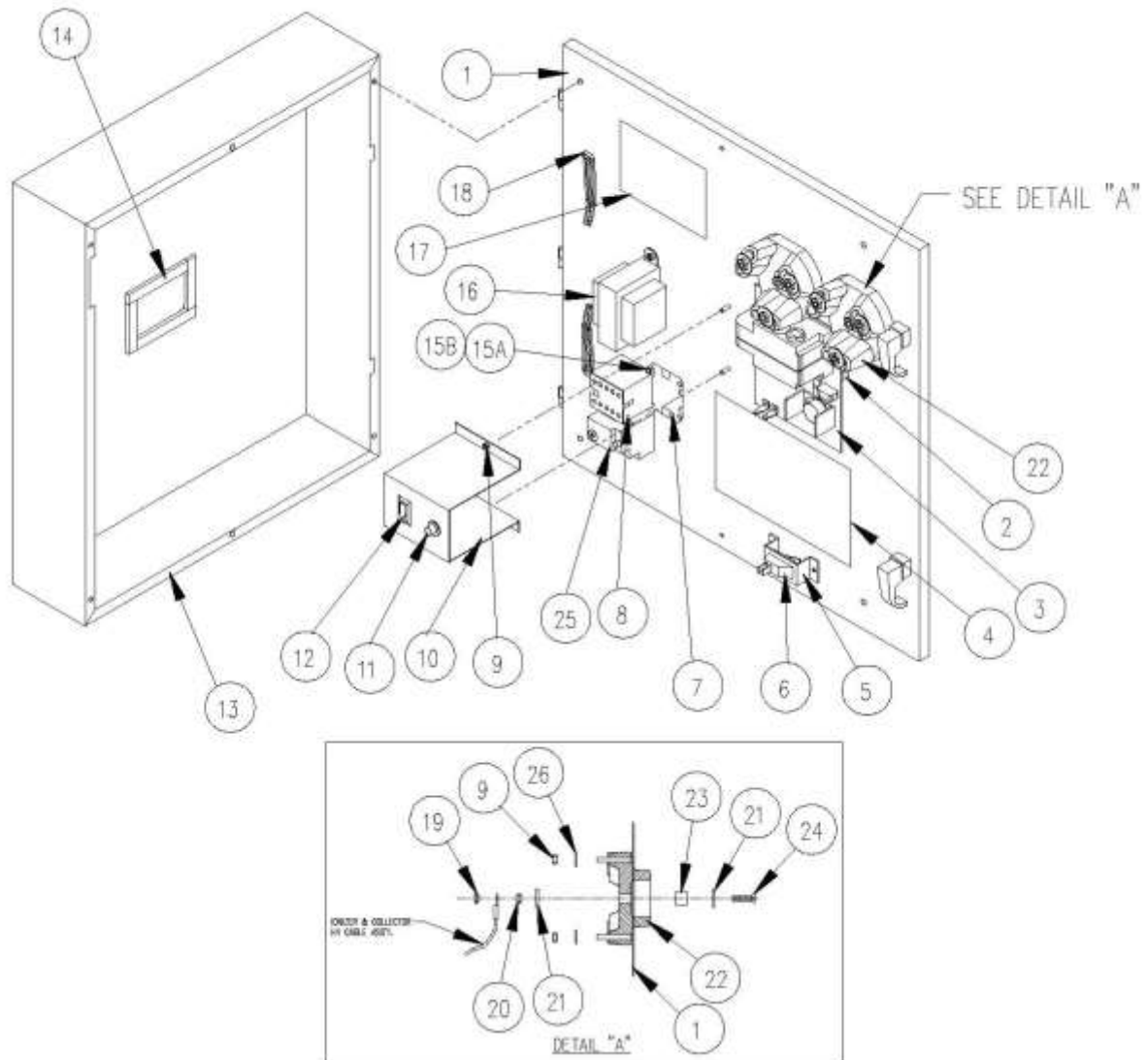
PCL 5000 Module Assemble



ITEM	PART NO.	DESCRIPTION	QTY.
1	247962-002	Cap Plug	2
2	224451-006	Aluminum Mesh Prefilter	2
3	450568-001	Ionizer Collector Cell	2
4	224779-028	Gasket, Adhesive Back (3/4" x 11/16")	19"
5	224779-015	Gasket, Adhesive Back (1" x 1/4")	86"
6	334562-005	Draw Latch	2
7	348667-001	Control Enclosure Assembly	1
8	252029-001	Label	1
9	149882-001	Outlet Box Cover	1
10	249884-001	Outlet Box	1
11	146442-001	Hinge	2

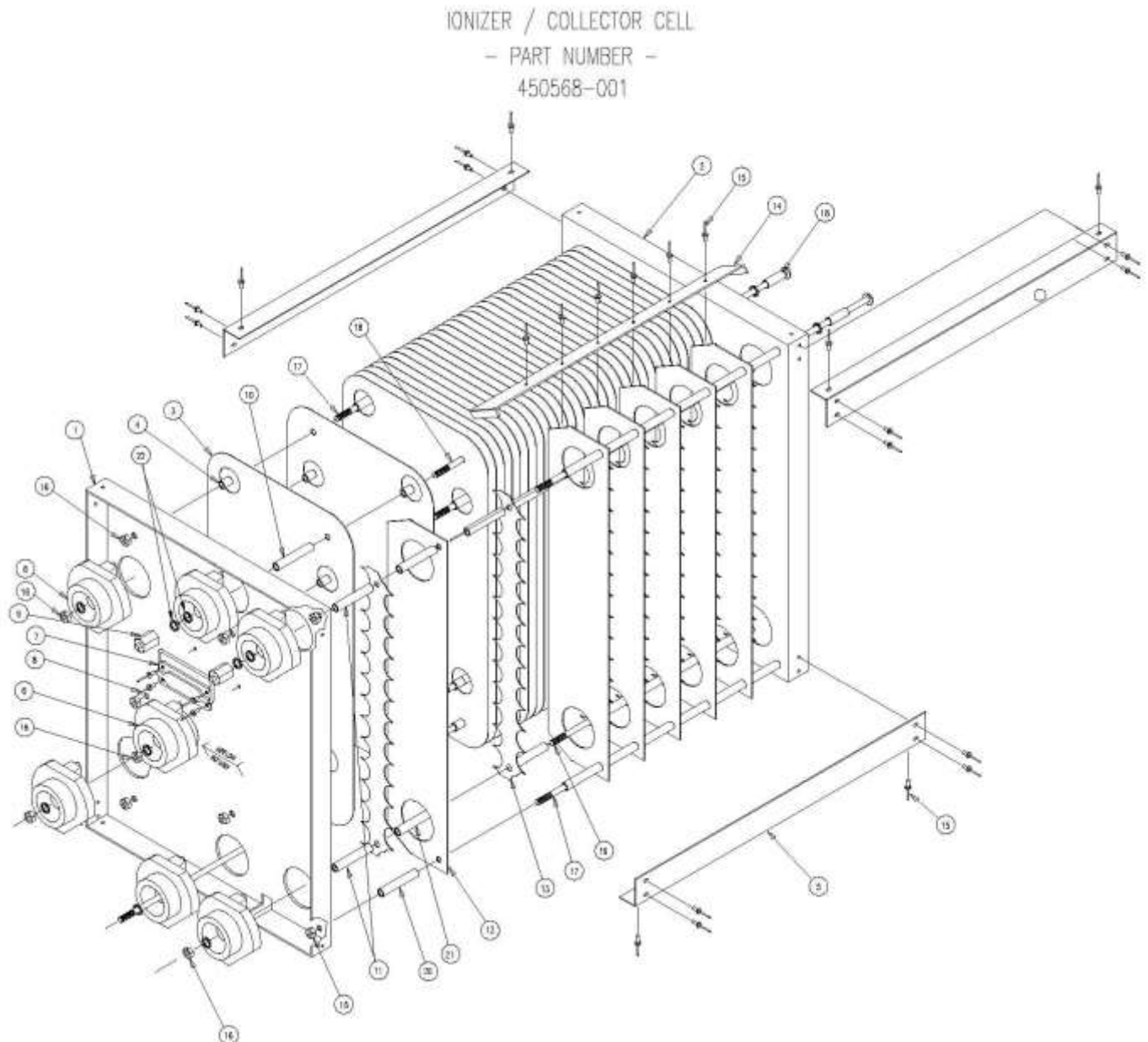
FIG 1

Enclosure Assembly PCL 5000



ITEM	PART NO.	DESCRIPTION	QTY.	ITEM	PART NO.	DESCRIPTION	QTY.
1	448648-001	Cell Door Assembly	1	12	138586-001	Switch - Off/On	1
2	119036	Spacer, Hex	3	13	224779-012	Gasket, Adhesive Back (1/4" x 1/8")	78"
3	347891-013	High Frequency Power Supply (T1300 & 1001)	1	14	224779-014	Gasket, Adhesive Back (1/2" x 3/16")	12"
4	347891-026	High Frequency Power Supply (T2600 & 2002)	1	15A	120032-002	Lockwasher (#8)	2
5	251257-001	Wiring Label 575V/60HZ/3 PH (T1300 & T2600)	1	15B	120036-004	Hex Nut (#8-32)	2
6	249043-001	Wiring Label 240V/50-60HZ/1 PH (T1300 & T2600)		16	248655-005	Transformer (120/208/240V-24)	1
7	249044-001	Wiring Label 120V/60HZ/1 PH (1001 & 2002)			248655-004	Transformer (480V-24)	
8	249045-001	Wiring Label 208,230,460V/60HZ/3 PH (1001 & 2002)			248655-007	Transformer (575V-24)	
9	249046-001	Wiring Label 240V/50HZ/1 PH (1001 & 2002)		17	121380-001	Warning Label, High Voltage	1
10	248751-001	Wiring Label 208,230,460V/60HZ/3 PH (T1300 & T2600)		18	143817-001	Strain Relief Bushing	2
11	248752-001	Wiring Label 120V/60HZ/1 PH (T1300 & T2600)		19	121800-005	Nut-Lockwasher (#10 - 24)	2
5	248604-001	Interlock Switch Bracket	1	20	120036-006	Hex Nut (#10 - 24)	2
6	244833-001	Interlock Switch	1	21	120608-011	Flat Washer S/S	4
7	249005-001	Contactor, 2 Pole (Single Phase Units Only)	1	22	353228-001	Standoff Insulator, Ceramic	2
8	247292-001	Contactor, (3 Phase Units Only)	1	23	222781-033	Spacer	2
9	121800-004	Nut - Lockwasher (#8-32)	13	24	122884-078	Flat Head Machine Screw (#10-24 x 1 1/2" Stainless Steel)	2
10	348605-001	Light Switch Bracket	1	25	250418-007	Overload Relay (575V unit only)	1
11	241101-009	Indicator Light	1	26	120031-008	Flat Washer	6

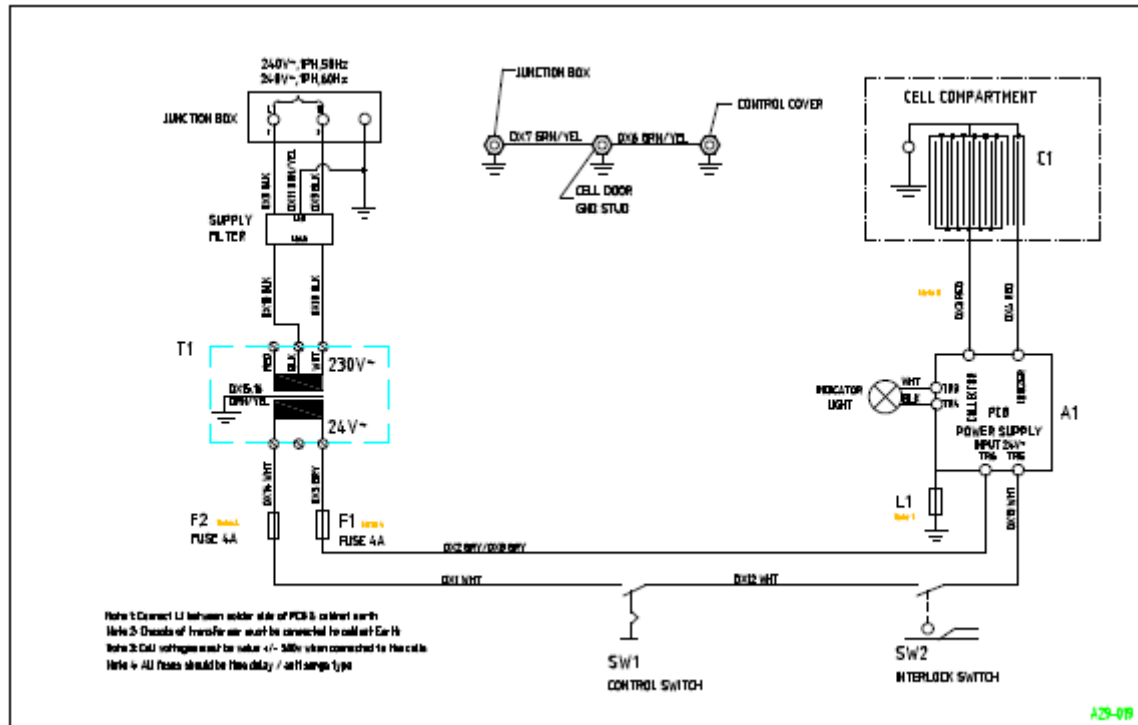
FIG 2



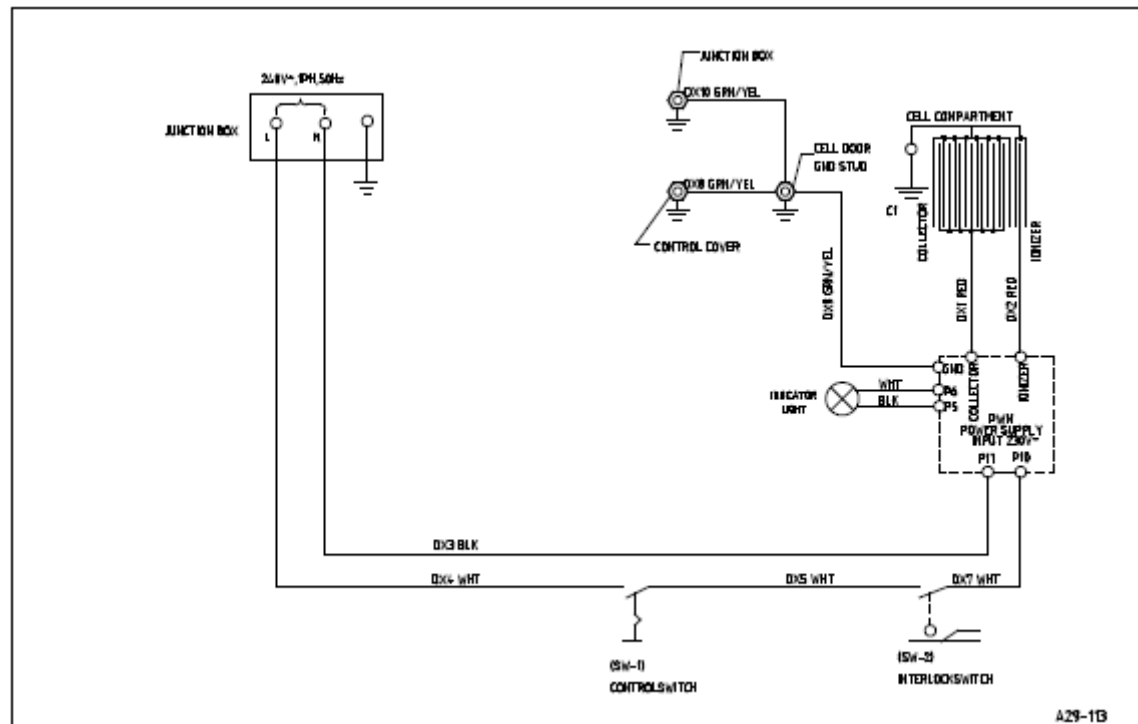
ITEM	PART NO.	DESCRIPTION
1	450551-001	End Plate (L.H.)
2	450551-002	End Plate (R.H.)
3	226555-001	High Voltage & Ground Plate
4	220107-070	Spacer
5	247924-002	Cell Brace
6	352212-001	Insulator
7	124537-001	Handle
8	220976-044	Rivet
9	147704-002	Contact
10	220107-111	Spacer
11	220107-112	Spacer, Spike To Insulator

ITEM	PART NO.	DESCRIPTION
12	247782-001	Ionizer Ground Plate
13	347892-001	Spiked Ionizer Blade
14	250567-001	Brace
15	120591-002	Rivet
16	123149-001	Nut, Elastic Stop
17	233137-031	Tie Rod
18	233137-030	Tie Rod
19	233137-015	Tie Rod
20	220107-109	Spacer, Ionizer Ground
21	220107-110	Spacer, Spike
22	121993-006	Fiber Washer

FIG 3

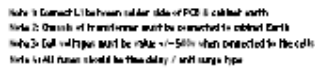


ESP 5000 – ESP ONLY



ESP 7500 – ESP ONLY

FIG 4 WIRING DIAGRAMS ESP ONLY



ESP 5000 – COMBINED ESP WITH UVC



ESP 7500 – COMBINED ESP WITH UVC

FIGURE 5 – WIRING DIAGRAMS FOR COMBINED ESP WITH UVC

Mains Connection into ESP-UV

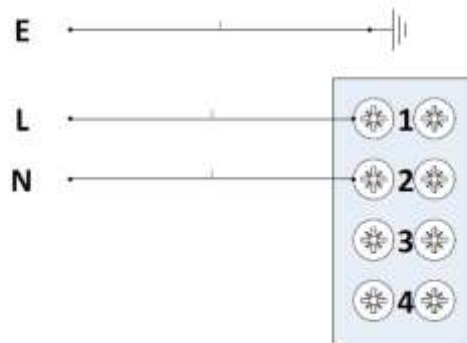


Figure 6 – MAINS CONNECTION TO ESP AND COMBINED ESP UVC

PART 2 – TECHNICLEAN UV-C

I. INTRODUCTION AND PURPOSE

⚠ The UV-C and Ozone system has been specifically rated to suit the design airflows for the ventilation supplied. If it is necessary to change the ventilation system for any reason then Plasma Clean should be consulted on the continued use of the UV-C and Ozone system.

This manual provides information on the safe operation and maintenance of the Plasma Clean UV-C and Ozone system. A pre-commissioning check list is shown in Appendix A.

This UV-C component is designed for the removal of odour and grease from commercial and industrial air extraction systems and should always be used in combination with suitable pre-filtration depending on the grease and smoke content of the treated air.

II. OPERATION

⚠ The UV-C system must not be operated without the extract ventilation fan running. The UV-C lamps generate small amounts of ozone, which is heavier than air and an irritant. Ozone can fall back into the cooking area if the UV-C system is operated without the ventilation fan operating.

⚠ To prevent the back-flow of ozone into the kitchen it is recommended to allow the fan to run-on for up to 10 minutes after the Techniclean UV-C unit is switched off.

The unit must be interlocked with air flow using a Plasma Clean Air Flow Interlock or equivalent (please enquire) and protected with a Class D MCB.

To reduce the impact of condensation it is recommended that the fan is left running for 30 minutes after cooking operations have finished. A class D MCB must be used for surge protection purposes.

⚠ Repeated rapid switching on and off of electronic ballasts can lead to premature failure.

⚠ Switching the UV-C lamps on and off reduces their useful operating life and each “on-off” cycle can reduce the life by one hour. Unnecessary switching should therefore be avoided.

After ignition UV-C lamps require a start-up period (typically 20 minutes) to reach full output.

It is essential that any replacement lamps that are installed have the same UV-C and ozone performance characteristics as the originals if the design performance of the equipment originally supplied is to be maintained. See section V for ordering spares.

⚠ In order for the UV-C system to operate as designed it is important that the UV-C lamps are kept clean and free from grease contamination.

⚠ Maintenance of this unit is to be carried out only by Plasma Clean approved contractors.

⚠ Always disconnect power to the equipment and unplug before performing any maintenance operations

III. MAINTENANCE

Plasma Clean or other experienced contractors approved by Plasma Clean should only carry out these maintenance activities.

Monthly, or bi monthly or as experience suggests, carry out the following routine maintenance: -

- Switch off and isolate the main ventilation fan.
- Switch off the UV-C lamps at the control panel and isolate and lock off the power supply.
- Check the condition of the UV-C lamps by removing the insert unit(s).
- Clean the lamps as set out below.
- Re-install the insert units replace front cover and switch on the ventilation and UV-C systems.

ANNUAL MAINTENANCE

The UV-C system should be cleaned and checked at least annually as part of a planned maintenance programme. Plasma Clean or other approved contractor should carry out the annual maintenance under a Planned Preventative Maintenance agreement.

The UV-C lamps have normal operating life of 9000 hrs after which time they should be replaced.

LAMP CLEANING

⚠ Check that the end caps supplying power to the lamps are positively in place. During the UV-C lamp cleaning process it is possible for the tubes to move and for the end caps to become disconnected.

The quartz glass used for the UV-C lamps is brittle and may break if knocked with sharp tools or rings etc.

During normal operation of the UV-C lamps a white powder will accumulate on the surface of the tubes. This white powder is an inert ash and is a product of the cold combustion process.

Any surface contamination will reduce the output of the lamps and limit their performance. It is essential that the UV-C lamps and all polished surfaces of the Insert Unit frames are clean.

The lamps can be cleaned with a damp cloth using warm water and a detergent. The lamps should then be wiped down with fresh clean water and dried using a lint free cloth. The lamps should then be wiped down with a clean rag dipped in 100% isopropyl alcohol. This liquid solvent can be purchased from a chemist or an industrial chemical cleaning supplier.

If the deposit on the tube proves to be difficult to remove or has been contaminated with grease a commercial heavy-duty detergent should be sprayed on to the lamp and left to soak for 10 minutes and then rinsed off. Follow this with the normal cleaning operation as described above.

IV. HANDLING AND DISPOSAL OF UV-C LAMPS

 **The lamps are made from quartz and should be handled as glass. The lamps contain traces of mercury. Any droplets of mercury and broken lamps should be disposed of safely in accordance with HSE regulations.**

Wear protective gloves when handling failed, broken or damaged UV-C lamps.

Remove the connection end cap or caps from the UV-C lamp. Carefully remove the UV-C lamp by withdrawing through the end box or housing. The lamps can become stuck to their grommets and care should be taken to ensure that the UV-C lamps do not break when handling. Ensure that failed lamps and any broken lamps are disposed of safely using facilities normally provided for fluorescent lamps.

V. ORDERING SPARE PARTS

When ordering spare parts from Plasma Clean, please state:

- Product names, supply voltage and serial number (see the identification plate on the equipment)
- Part number
- Description
- Quantity

VI. SPECIFICATION

TECHNICLEAN UV-C 6 LAMP SHORT FRAME FILTRATION SYSTEM

Specification	UV-C6
Volume flow rate	Normal odour / after ESP : up to 1.4m ³ /s Heavy odour : up to 1.1m ³ /s
Power	522W
Power supply	1ph / 230V / 50Hz / 2.27A Class D circuit breaker required
Dimensions	525 H x 1051 W x 220 D mm
Weight	25kg
Pressure Drop	50 Pa (no light guard)
Construction	Powder coated mild steel
Optional extras	Flow proving switch Hours run meter (to monitor lamp life) Sequential lamp frame start-up (for multiframe systems)

TECHNICLEAN UV-C 8 LAMP SHORT FRAME FILTRATION SYSTEM

Specification	UV-C8
Volume flow rate	Normal odour / after ESP : up to 2.1m ³ /s Heavy odour : up to 1.5m ³ /s
Power	696W
Power supply	1ph / 230V / 60 Hz / 3.2A Class D circuit breaker required
Dimensions	533H X 1574W X 220L mm
Weight	30kg
Pressure Drop	50 Pa (no light guard)
Construction	Powder coated mild steel
Optional extras	Flow proving switch Hours run meter (to monitor lamp life) Sequential lamp frame start-up (for multiframe systems)

APPENDIX A: PRE-COMMISSIONING CHECKLIST

The following items should be checked following mechanical installation of the kitchen canopy and ductwork and fans. Ideally there will be commissioning certificates available.

Installation

The unit is designed to be installed in the extraction ducting of a commercial kitchen canopy, located downstream of the canopy and up stream of the fan, in accordance with the Installation, Operating and Maintenance Manual.

ELECTRICAL SUPPLY

THE UNIT MUST BE INTERLOCKED WITH AIR FLOW AND PROTECTED WITH A CLASS D MCB – BY OTHERS.

THE POWER SUPPLY IS TO BE LOCATED WITHIN 1 M OF THE UNIT – BY OTHERS.

Check list for ductwork and fans:

- Check ductwork has been blown clean.
- Open inspection doors and check for construction debris.
- Check ductwork run from canopy to vent is complete, supported and inspection doors closed.
- Check fans run in correct direction and without excessive vibration.
- Check any fan interlock requirements.
- Review air flow balancing results to check correct flows to each canopy / duct run.
- Check gas supply to appliances turn off when extract fan turned off.
- Check correct make-up airflows to each area of kitchen.
- Check power supply available to UV control panel.
- Check protection on client's power supply is Class D MCB

Check list for canopy installation:

- Check grease filters correctly installed
- Check ballast boxes/ plates accessible and correctly positioned
- Check plastic pipes to air pressure switches correctly connected
- Check safety strap on insert units attached

On some sites there may be additional activities by other trades after the canopies have been installed and checked. A final check is then required: see below:

Final Check List

Check fire suppression pipework, telephone cables BMS cables do not interfere with access to lamp frames, air supply plenum or ballast boxes.

Check appropriate access panels or ceiling tiles are to available allowing access to ballast boxes in ceiling void.

When the above checks are complete the UV system is ready for commissioning.

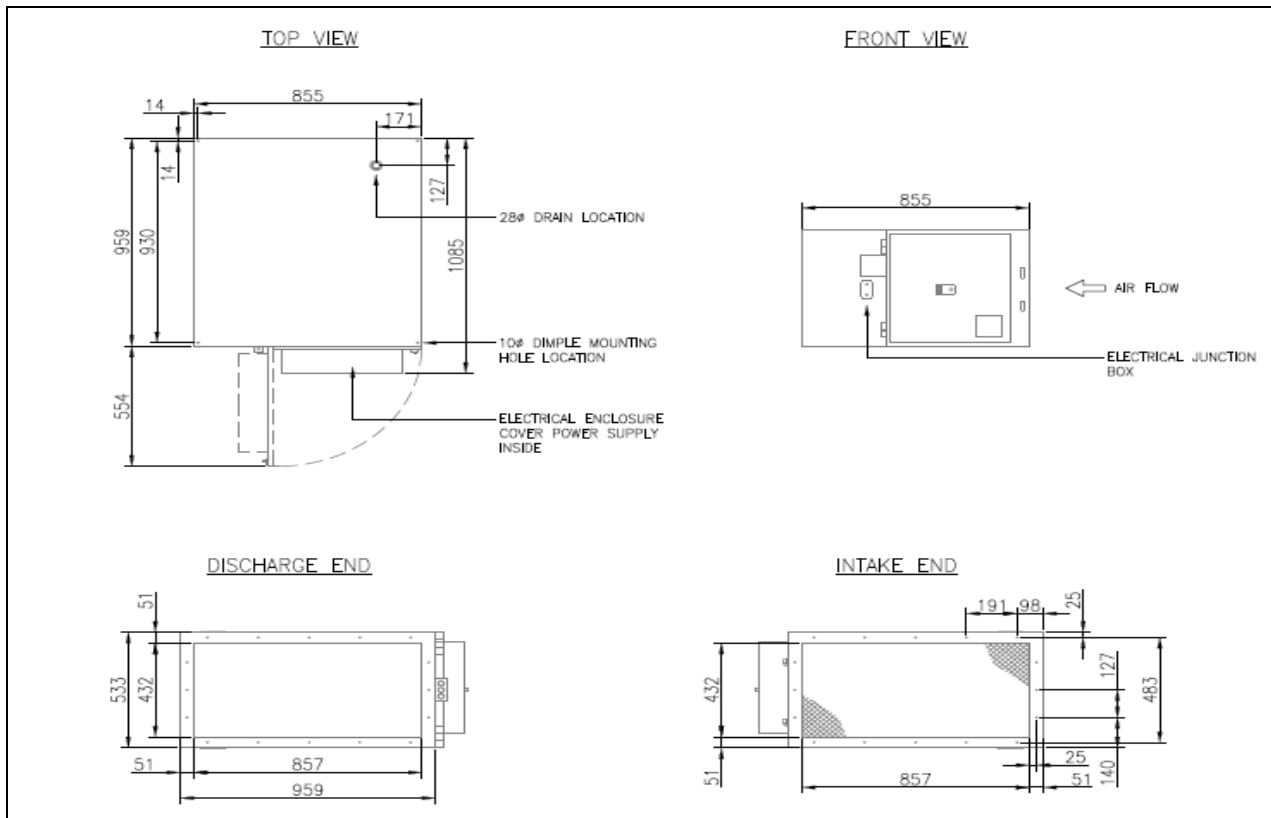
See Appendix B for a maintenance checklist.

APPENDIX B: MAINTENANCE CHECK LIST

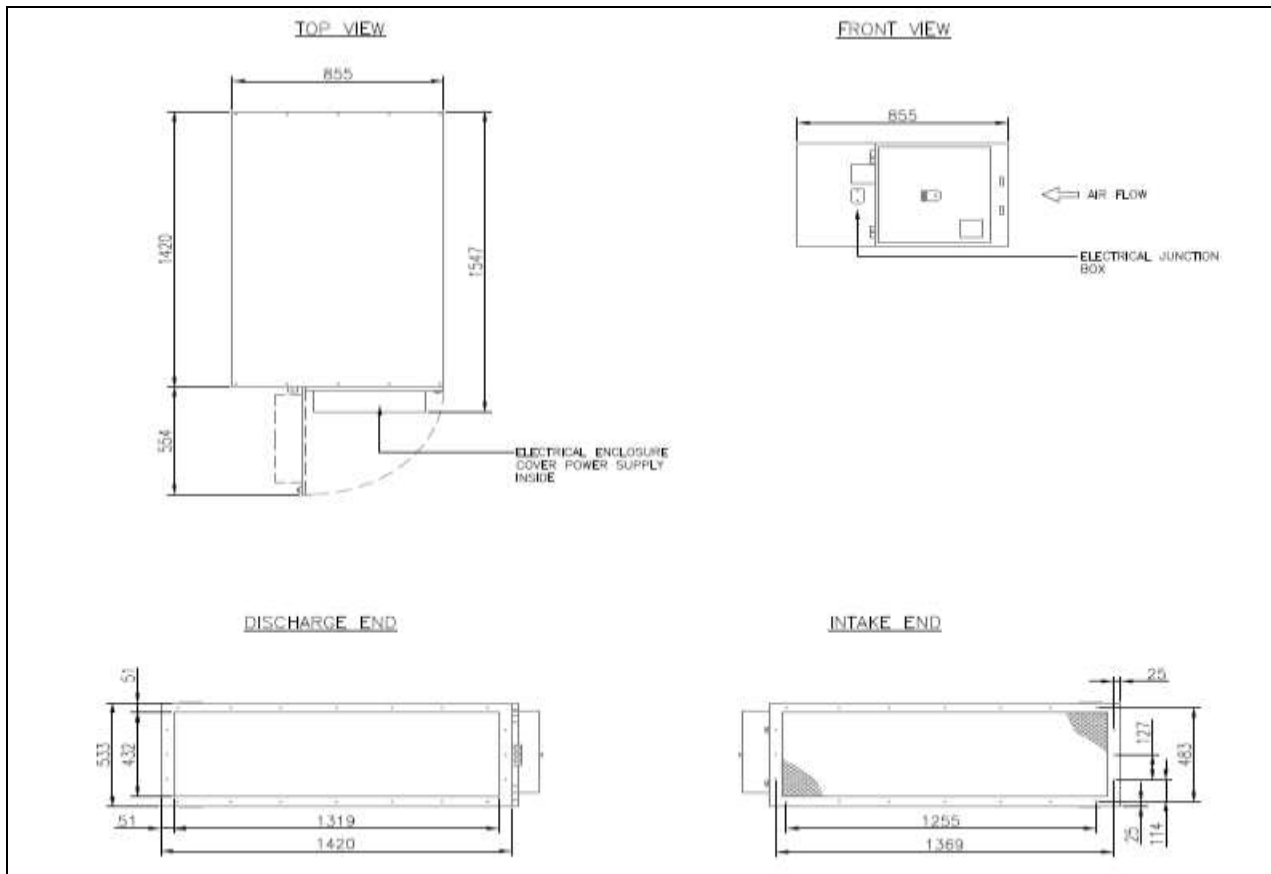
Item	Details	Completed
A	UV-C Control Panel	
	Check the control panel for alarms (if applicable)	
	Record operating hours	
	Switch off the UV-C lamps and isolate	
	Switch off kitchen ventilation fan and isolate	
	Check and clean control cubicle air filter(s) (if applicable)	
	Check and replace any failed indication lamp bulbs (if applicable)	
	Check and clean/replace UV-C control panel filters (if applicable)	
B	Cleaning UV-C Lamp Insert Units	
	Switch off the UV-C lamps and isolate	
	Switch off ventilation fan and isolate	
	Remove and check each UV-C lamp insert unit	
	Replace damaged/failed UV-C lamps	
	Replace lamps over 8000 hours use	
	Clean the UV-C lamps	
	Clean UV-C lamp frames	
	Check for loose UV-C lamp connections	
	Clean internal canopy reflecting surfaces	
	Re-install the insert units and connect plugs	
C	Re-Commissioning	
1	Switch on the ventilation and UV-C systems	
2	Check that all UV-C lamps are operating	
3	Check operation of any door or access panel interlocks	
4	Check operation of any air pressure switches	
5	Adjust pressure switch settings	
6	Record pressure switch settings	
7	Check operation ventilation fan is operating	
8	Complete the Maintenance Report and return to office	

NOTES:

APPENDIX C: TECHNICAL DRAWINGS: COMBINED ESP WITH UVC



PCL 5000 ESP/UV-C



PCL 7500 ESP/UV-C

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