

Kitchen Fume Extract Strategy Report – Rev 2

New Century Hall, Mayes Street, Manchester, M60 4ES

Introduction

This document has been prepared following granting of Planning Permission 124348/FO/2019 dated 26 July 2019 relating to New Century Hall, Mayes Street, Manchester. Condition 13 of the Planning Permission granted required;

Final details of the method of extraction of any fumes, vapours and odours from the restaurant kitchen shall be submitted to and approved in writing by the City Council as local planning authority prior to commencement of those uses. The details of the approved scheme shall be implemented prior to occupancy and shall remain in situ whilst the use or development is in operation.

Defra have published a document entitled 'Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems' (withdrawn but still available via an internet search). It describes a method of risk assessment for odour, guidance on minimum requirements for odour and noise control, and advice on equipment selection. It is recommended that any scheme should make reference to this document (particularly Annex B) or other relevant guidance. Details should also be provided in relation to replacement air. The applicant will therefore need to consult with a suitably qualified ventilation engineer and submit a kitchen fume extract strategy report for approval.

This Kitchen Fume Extract Strategy Report sets out the details of the proposals for the method of fumes, vapours and odours and also provides information on the replacement air for the systems proposed.

An overall description of the systems proposed is outlined below, while Annex A, B, C & D include the required supporting information.

Overall Description

Basement Kitchen

Extraction will be delivered to the basement level, food preparation kitchen via a bifurcated axial fan, mounted in the external plant compound along the Mayes Street elevation. Ductwork will connect from the fan and run along the external elevation before entering the building at Ground Floor level. Kitchen extract ductwork within the Ground Floor demise will be fire rated and will be wrapped in fire rated insulation. Extract ductwork within the kitchen ceiling void will connect to a canopy.

Air will be extracted from the canopy and will pass through an electrostatic precipitator (ESP) and an odour control unit (OCU). These units will remove grease and neutralise odours before the air is discharged externally. Access doors will be installed throughout the ductwork run to allow ductwork cleaning to be undertaken.

Make up air to the kitchen canopy will be provided by a supply fan mounted above the ceiling void in the kitchen area. A new ductwork connection will be made to the existing plenum in the kitchen ceiling void which is currently used for the smoke extract system installed at CAT A stage (by others). A motorised smoke & fire damper (MSFD) will be installed just after the point the new spigot is connected to the plenum. The MSFD will be connected to the existing fire alarm and will shut on activation of the fire alarm. In a normal condition, the MSFD will be

open to allow make up air to be provided to the canopy. Ductwork will connect to the supply fan & air will be tempered via an electric heater battery, mounted inline within the ductwork. The heater battery will be controlled via a duct mounted thermostat, if the outside air temperature is below the temperature set point, the heater will run and temper the air delivered to the canopy.

A control panel will be installed (location TBC) to provide control of the kitchen ventilation systems. The kitchen ventilation systems will be interlocked with the gas solenoid valve. In the event that the kitchen extract fan is off or is not achieving a minimum air flow, the gas solenoid will close, shutting off the gas supply to the kitchen. The control panel will be interlocked with the fire alarm system to shut the ventilation systems down on activation of the fire alarm

Ground Floor Food Pods

Extraction will be delivered to pods 3,4 and 5 via bifurcated axial fans, mounted in the external plant compound along the Mayes Street elevation. Ductwork will connect from the fan and will enter the building at Ground Floor level, through the louvre within the WC area.

Air will be extracted from each canopy and will pass through an electrostatic precipitator (ESP) and an odour control unit (OCU). These units will remove grease and neutralise odours before the air is discharged externally. Access doors will be installed throughout the ductwork run to allow ductwork cleaning to be undertaken.

Extraction will be delivered to pods 2, 6 and 7 via bifurcated axial fans, mounted at high level above each pod area. Air will be extracted from each canopy and will pass through an electrostatic precipitator (ESP) and a series of carbon filters or odour control units (OCU). These units will remove grease and neutralise odours before the air is discharged externally through the high level external louvres on the Sadlers Yard elevation. Access doors will be installed throughout the ductwork run to allow ductwork cleaning to be undertaken.

Controllers will be installed (location TBC) to provide individual control of each pod extract system. Each pod extract system will be interlocked with the fire alarm system to shut the systems down on activation of the fire alarm.

Annex A – Drawings & Extract Fan

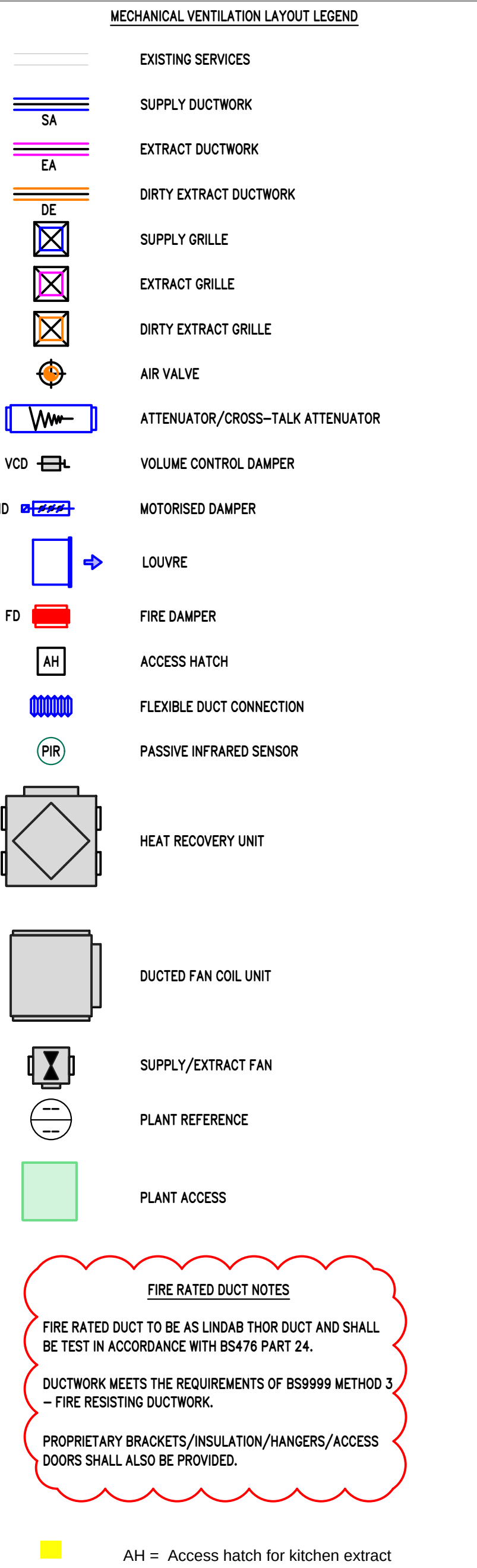
M10 P2 AC & Ventilation – Basement
M11 P2 AC & Ventilation – Ground Floor
M12 P2 AC & Ventilation – Mezzanine
M13 P2 AC & Ventilation – Schematic
Systemair MUB T 062 630EC EF11 Kitchen Extract Fan

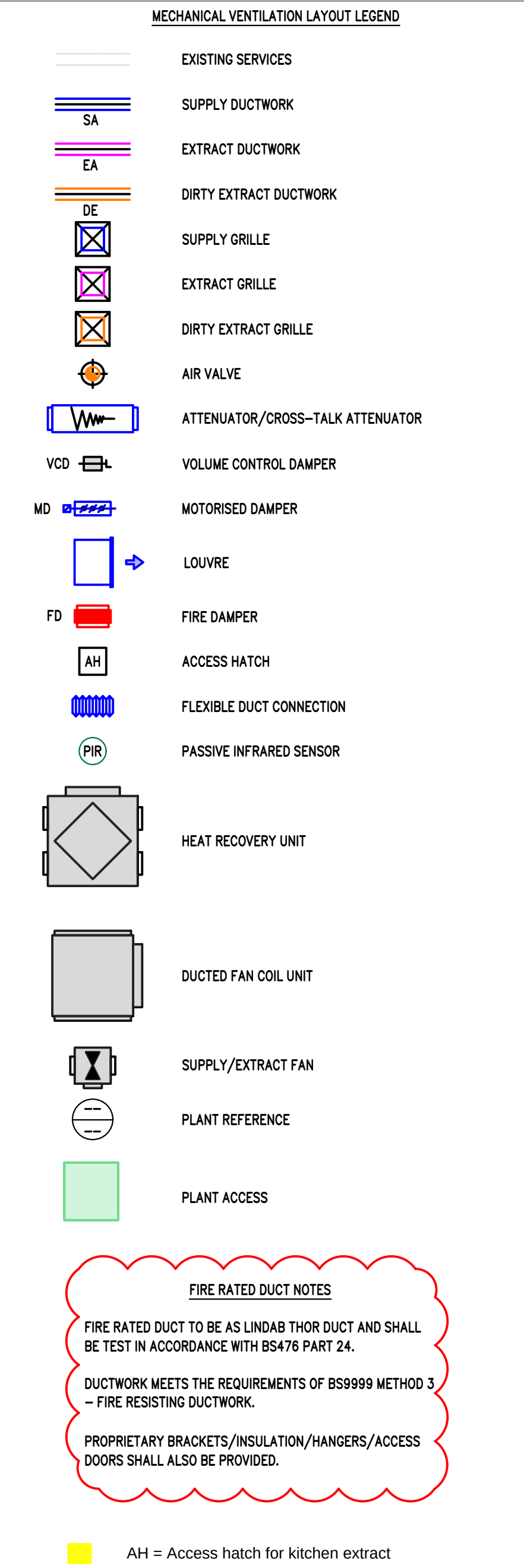
Annex B – Response to Defra Guidance

Annex C – Details on Electrostatic Precipitator

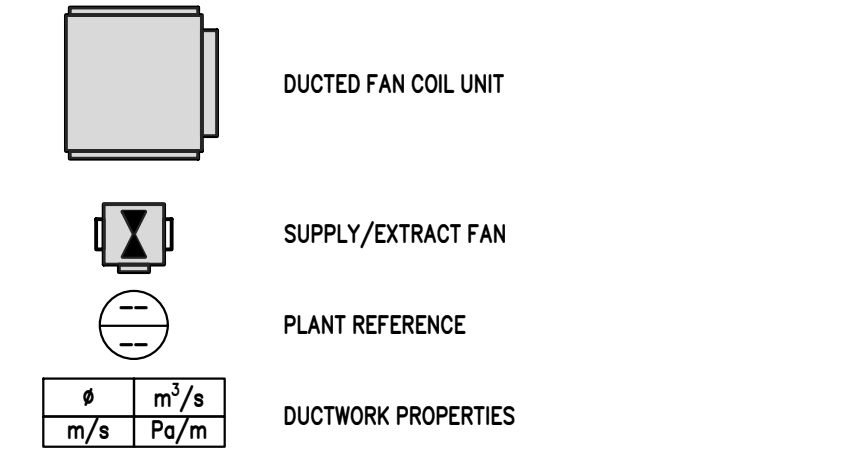
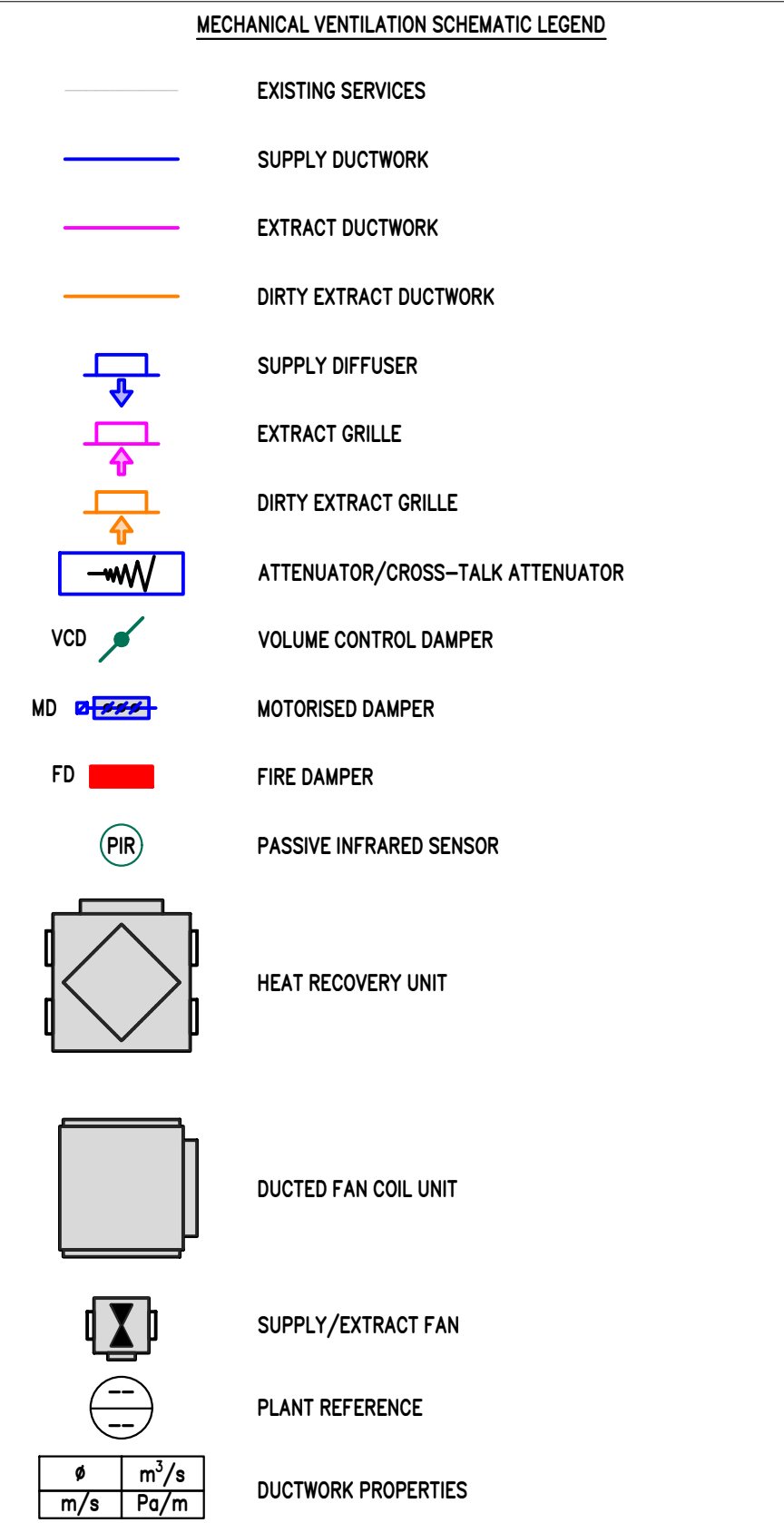
Annex D – Details on Odour Control

Annex A – Drawings & Extract Fan









MUB/T 062 630EC

Centrifugal box fan, 120°C continuous, insulated

Item Number: [161705](#)

Variant: 400V 3~ 50/60Hz

- EC-motors, high level of efficiency
- 100% speed controllable
- Up to 120°C medium temperature, continuous operation
- Multi-functional use, e.g. for kitchen exhaust air
- Pre-assembled isolator is standard
- Low sound level
- Easy to maintain and reliable
- Motor outside the air stream
- Integrated motor protection
- Potentiometer included for ease of commissioning

EC technology is intelligent technology; using integral electronic control which eliminates the slip losses in the motor and ensures that the motor always runs at optimal load and guarantees that the proportion of energy utilized effectively is many times higher and the energy usage considerably lower compared with AC motors. EC fans are notable for their economical use of energy and excellent ease of control.

They can be varied in speed to match the airflow demand, and operate at high efficiency levels. For the same air volume, they consume distinctly less energy than AC fan drives. Another special feature of EC fans is their energy-saving potential not only at full load, but especially at part-load. When operating at part load, the energy used is much lower than with an asynchronous motor of equivalent output. Reduced energy usage guarantees a drop in operating costs. The power electronics are integrated in the motor housing.

All MUB/T-EC models have one potential-free terminal for error message. All motors are suitable to be used for 50/60Hz. The input voltage for single phase units can vary between 200 and 277V, for three phase units between 380 and 480V. Speed control by a 0-10V signal. The fans are delivered with a pre-wired potentiometer (0-10 V) that allows you to easily find the required working point. All MUB/T-EC fans have impellers with backward curved blades, manufactured from aluminium. The MUB/T-EC fans are suitable for medium temperatures up to 120°C continuously. The casing consists of an aluminium frame with fibreglass reinforced plastic corners and double skin, galvanised steel panels with a 30 mm mineral wool insulation. Panels are removable, allowing flexible ventilation solutions - the air direction can easily be changed. With quick lock access door. The MUB/T-EC bottom panel is shaped as a condensate tray and incorporates a pre-mounted 1" drain plug. An isolator switch is mounted on the casing. Several filter modules like f.e. activated carbon- or aluminum filters are available, calculated individually on the working point.



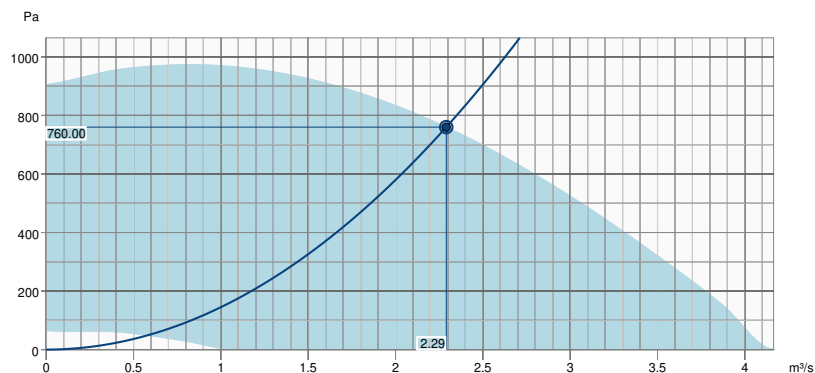
Technical parameters

Nominal data		
Voltage (nominal)	400	V
Frequency	50; 60	Hz
Phase(s)	3~	
Input power	2,816	W
Input current	4.18	A
Impeller speed	1,512	r.p.m.
Air flow	max 4.165	m³/s
Temperature of transported air	max 120	°C
Max temperature of transported air, when speed controlled	120	°C

Protection/Classification	
Enclosure class, motor	IP55
Insulation class	F
Data according to ErP	
ErP ready	Not ErP relevant
Dimensions and weights	
Weight	113.25 kg
Others	
Motor type	EC

Performance

Performance curve



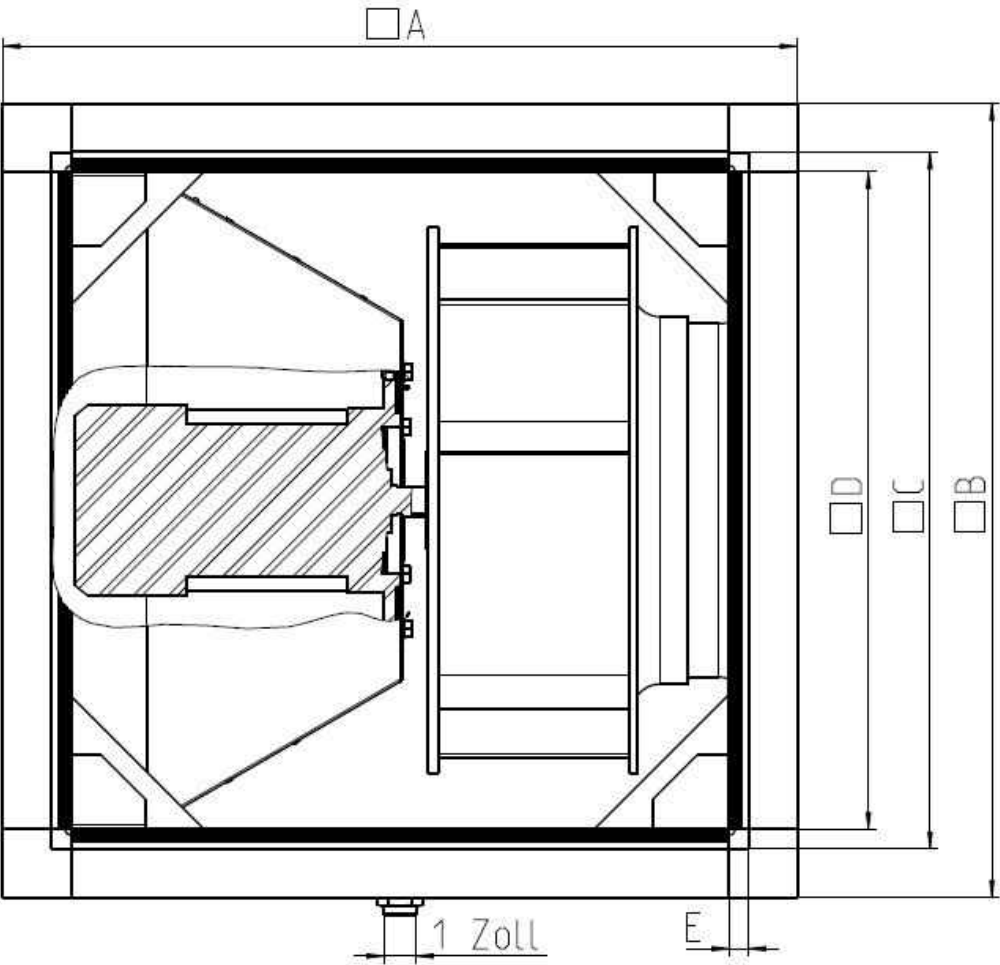
Hydraulic data

Required air flow	2.29 m³/s
Required static pressure	760 Pa
Working air flow	2.29 m³/s
Working static pressure	760 Pa
Air density	1.204 kg/m³
Power	2805.2 W
Fan control - RPM	1512 rpm
Current	4.15 A
SFP	1.225 kW/m³/s
Control voltage	10.0 V
Supply voltage	400 V

Sound power level		63	125	250	500	1k	2k	4k	8k	Total
Inlet	dB(A)	55	68	71	75	75	71	67	62	80
Outlet	dB(A)	54	74	74	78	78	76	71	66	84
Surrounding	dB(A)	38	59	58	47	48	46	40	31	62
Sound pressure level at 3m (20m² Sabine)	dB(A)	-	-	-	-	-	-	-	-	55
Sound pressure level at 3m free field	dB(A)	-	-	-	-	-	-	-	-	41

Dimension

MUB/T 062	□A	□B	□C	□D	E
500/560/630	820	820	720	678	21



Accessories

- CXE/AVC Modbus (37256)
- EC-Basic-H humidity (24807)
- EC-Basic-U universal 0-10V (24806)
- EC-Vent Room Unit (3018)
- M-SG 062/718x718 (301346)
- MTP 20, on/off, 3-step (310220)
- S-5EC/FRQ (76738)
- TUNE-AHU-DE008-062-718x718-M0 (79882)
- UGS 062/630 adapter flex 120°C (38371)
- WSD 062 (860x860x70) complete (31482)
- CO2RT-R-D Transmitter (6993)
- HR1 Room Humidistat (215150)
- RT 0-30 Room Thermostat (5151)
- CCM inlet MUB062 d630 (311783)
- CCM outlet MUB062 d630 (311681)
- CCMI outlet 062 d630 KIT 30mm (239096)
- KKF-ALU 062-filter-section (376816)
- KKF-CAR 100-filter-section (277348)
- KKF-KITCHEN 100-filter-section (277367)
- EC-Basic-CO2 and temperature (24808)
- EC-Basic-T temperature (24805)
- EC-Vent control board (3115)
- FGV 062/716-716 flex. conn. (4198)
- MTP 10, 10K, Speed control (32731)
- MTV-1/010 Controller 0..10V+ (30650)
- SD-MUB Vibration pad set (37324)
- UGS 062/500 adapter flex 120°C (38370)
- UGS 062/630 adapter flex. (4358)
- WSG 062 MUB/T complete (36067)
- FGV 062/716-716 flex. 120°C (38362)
- Presence detector/IR24-P (6995)
- CCM inlet MUB062 d560 (311782)
- CCM outlet MUB062 d560 (311684)
- CCMI outlet 062 d560 KIT 30mm (239095)
- GRU 062 base frame h= 100mm (276662)
- KKF-CAR 062-filter-section (277347)
- KKF-KITCHEN 062-filter-section (277364)
- KKS 062 silencer-section (276852)

Documents

- imo_mub_all_010_en_248056
- UKCA DECLARATION OF CONFORMITY_THERMOFANS_EN_[001].PDF
- COMMISSIONING REPORT_FANS_160628_EN_001.PDF
- MUB-T 042 500-560 EC-Poti_37204_DE-EN.pdf

Annex B – Response to Defra Guidance

DEFRA Risk Assessment
Site: New Century Hall, Manchester

Date: 03rd August 2022

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Document Control

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Job Number	SE4518
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Reviewed by	
Reviewed changes made by date	

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1 Introduction

1.1 This report sets out an odour risk assessment for a proposed bar / restaurant

1.2 The proposed unit will require a number of kitchen extraction systems serving cooking pods which must be suitably designed to avoid any odour impacts relating to cooking odours being released to the atmosphere from the system.

1.3 This report sets out the methodology and findings of the odour risk assessment, and describes the odour abatement that will be required for the kitchen extraction system to minimise the risk of odour impacts resulting from the operation of the proposed unit. This report has been prepared by Solution Environmental Services Ltd.

2 Odour Assessment

2.1 Defra's Guidance on the 'Control of Odour and Noise from Commercial Kitchen Exhaust Systems' (Defra, 2005) contains an assessment procedure for identifying the potential risk of odour impacts from commercial kitchen operations. The results of this risk assessment can be used to determine a suitable level of odour abatement to be installed into a commercial kitchen.

2.2 The risk assessment for odours is split into the following four parts:

- dispersion;
- proximity to receptors;
- size of kitchen; and
- cooking type and grease loading.

2.3 Each part is given a risk rating score and the total risk rating denotes the level of odour abatement which is likely to be required to prevent the kitchen from causing odour nuisance impacts. The following sections of this report outline each part of the risk assessment in relation to the proposed unit.

2.4 It should be noted that where assumptions have been made within this risk assessment, these are clearly stated and are based on the professional experience of 1st Aurora Ltd.

Dispersion

2.5 The risk rating for dispersion relates to the conditions under which kitchen extraction emissions are discharged. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- VERY POOR (20) – Low level discharge, discharge into courtyard, or restriction on stack;
- POOR (15) – Discharge not low level, but below eaves, or discharge rate below 10 m/s;
- MODERATE (10) – Discharging 1 m above eaves at a rate of 10-15 m/s;
- GOOD (5) – Discharging 1 m above ridge at a rate of 15 m/s or more.

2.6 Air extracted from the basement level kitchen and pods 3, 4 and 5 of the proposed unit will be emitted to the atmosphere via a vertical duct, which will terminate within the external plant area approximately 4 metres above floor level. The velocity of the discharge on the basement kitchen system is approximately 12m/s and approximately 14m/s on the system serving pods 3, 4 and 5.

The risk rating for dispersion for the above systems is described as MODERATE.

Air extracted from pod 2 (pizza pod) and pod 6 & 7 will be emitted to the atmosphere via louvre connections on the Sadlers Yard elevation. The velocity of the discharge on the pod 2 system is approximately 2.5m/s and approximately 6.5m/s on the system serving pods 6 & 7.

The risk rating for dispersion for the above systems is described as POOR.

Proximity to Receptors

2.7 The risk rating for proximity to receptors relates to the distance between the point of discharge of kitchen emissions and the nearest sensitive receptor locations. Sensitive receptor locations may be residential properties, commercial premises or frequently used public open spaces. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- CLOSE (10) – Closest sensitive receptor is less than 20 m from kitchen discharge;
- MEDIUM (5) – Closest sensitive receptor is between 20 and 100 m from kitchen discharge;
- FAR (1) – Closest sensitive receptor is more than 100 m from kitchen discharge.

2.8 The risk rating for the proximity to residential properties on the Sadlers Yard elevation is judged to be CLOSE. The closest sensitive receptors are approximately 10 m away in Redfern Building, the usage of the building on the lower floors is currently office & leisure space.

The risk rating for the proximity to residential properties on the Mayes Street elevation is judged to be MEDIUM. The closest sensitive receptors are approximately 30 m away.

Size of Kitchen

2.9 The risk rating for size of kitchen relates to the volume of food prepared by the kitchen and is described in terms of the capacity of the restaurant or take-away. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- LARGE (5) – More than 100 covers or a large-sized take-away;
- MEDIUM (3) – Between 30 and 100 covers or a medium-sized take-away;
- SMALL (1) – Less than 30 covers or a small take-away.

2.10 Based on discussions with the management and end users of the space, it is judged that the most appropriate risk rating for usage of each pod and kitchen is LARGE (over 100 meals per day).

Cooking Type and Grease Loading

2.11 The risk rating for cooking type and grease loading relates to the type of cooking methods employed in the kitchen and the type of food prepared. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- VERY HIGH (10) – Pubs (those serving a high level of fried food), fried chicken, burgers or fish and chips;
- HIGH (7) – Kebab, Vietnamese, Thai or Indian;
- MEDIUM (4) – Cantonese, Japanese or Chinese;
- LOW (1) – Most pubs, Italian, French, Pizza or Steakhouse.

2.12 It is intended that the unit will be occupied by various different vendors, cooking a variety of meals within the cooking pods:

Sadlers Yard elevation

Pod 2- Pizza

Pod 6- Sushi

Pod 7- Grilled meats

The risk rating would be classified as MEDIUM risk for cooking type.

Mayes Street elevation

Pods- Vietnamese, Japanese, Gourmet Sandwiches

Production kitchen- cooking of sauces for each pod

The risk rating would be classified as LOW risk for cooking type.

Risk Assessment Summary

2.13 The odour risk assessment summary for the proposed Sadlers Yard elevation is shown in Table 1.

Table 1

Sadlers Yard Odour Risk Assessment Summary Criteria	Risk Rating	Risk Score 1	Description	Comments
Dispersion	Poor	15	Discharge not low but below eaves	Discharge through ductwork approx. 4 metres above floor level at between 12-14m/s.
Proximity to receptors	Close	10	Closest adjacent sensitive receptors are 10 m from kitchen discharge.	Receptors are below roof (and thus discharge) level.
Size of Kitchen	Large	5	More than 100 meals per day.	Pods expected to serve 100 meals per day.
Cooking Type and Grease Loading	Med	4	Most pubs, Italian, French, Pizza or Steakhouse	The intended use of each pod is classed as medium grease levels.
TOTAL RATING	High	34		A high level of odour abatement required.

Total Risk Score of <20 = Low to Medium Risk, 20 to 35 = High Risk; and >35 = Very High Risk.

2.14 The overall odour risk rating of the unit is 'High Risk' (based on a risk score of 34). This denotes that it would require a high level of odour control to eliminate the risk of odour impacts for nearby residential properties.

2.15 The intended use of the pods on Sadlers Yard is for 3no. vendors to cook a variety of different foods. Based on the Defra risk assessment, if it is assumed that the score would be 34, which represents a 'High' risk of odour impacts. This is taken into account in the discussion on odour abatement in the following section of this report.

2.16 The odour risk assessment summary for the proposed Mayes Street elevation is shown in Table 2.

Table 2

Mayes Street Odour Risk Assessment Summary Criteria	Risk Rating	Risk Score 1	Description	Comments
Dispersion	Moderate	10	Discharge 1m above eaves at a rate of 10-15m/s	Discharge through louvres at no greater 6.5m/s
Proximity to receptors	Medium	5	Closest adjacent sensitive receptors are 30 m from kitchen discharge.	Receptors are below roof (and thus discharge) level.
Size of Kitchen	Large	5	More than 100 meals per day.	Pods expected to serve 100 meals per day.
Cooking Type and Grease Loading	Low	1	Most pubs, Italian, French, Pizza or Steakhouse	The intended use for pods 3,4 & 5 and production kitchen is low grease levels.
TOTAL RATING	Medium	21		A medium level of odour abatement required.

Total Risk Score of <20 = Low to Medium Risk, 20 to 35 = High Risk; and >35 = Very High Risk.

2.17 The overall odour risk rating of the unit is 'High Risk' (based on a risk score of 21). This denotes that it would require a high level of odour control to eliminate the risk of odour impacts for nearby residential properties.

2.18 The intended use of the pods on Mayes Street is for 3no. vendors to cook a variety of different foods. Based on the Defra risk assessment, if it is assumed that the score would be 21, which represents a 'High' risk of odour impacts. This is taken into account in the discussion on odour abatement in the following section of this report.

3 Recommended Odour Abatement System

3.1 This section of the report briefly outlines the odour control measures that would need to be installed on the kitchen extract system at the proposed unit to provide optimal odour abatement and minimise the risk of odour impacts at surrounding properties.

3.2 The odour risk assessment has identified a high risk of odour impacts from the operation of the cooking pods on Sadlers Yard elevation. The odour abatement measures set out below therefore consider a high risk use. ESPs and carbon filtration will be installed to the cooking pods installed on the Sadlers Yard Elevation. ESPs and OCUs are installed to the cooking pods & basement prep kitchen on the Mayes Street elevation.

3.2 The odour control measures suggested within Defra's guidance on odours from commercial kitchens (Defra, 2005) for kitchens with a 'High' odour risk assessment score include:

1. *Fine filtration or ESP1.*
2. ESP = Electrostatic Precipitation. This is a form of fine particulate filtration that does not involve fibre filters.
3. *Fine filtration followed by counteractant/neutralising system to achieve the same level of control as 1.*

3.3 The odour control measures suggested within Defra's guidance on odours from commercial kitchens (Defra, 2005) for kitchens with a 'High' odour risk assessment score include:

1. *Fine filtration or electrostatic precipitation (ESP) followed by carbon filtration (carbon filters rated with a 0.2-0.4 second residence time).*
2. *Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.*

3.4 It is recommended that rather than installing a 'one-size-fits-all' odour abatement system to cover any potential use of the unit, the abatement system is designed to be commensurate to the intended use of the unit on first occupation. This may require an upgrade to the system in the future, if, for example, the unit were to be initially occupied by a coffee shop, but later occupied by an Indian restaurant.

3.5 Uses of the proposed unit which would require a **low to medium** level of odour abatement include: coffee shop, sandwich bar, Italian restaurant, French restaurant, steakhouse, pub, or pizza restaurant.

3.6 Uses of the proposed unit which would require a **high** level of odour abatement include: Indian, Chinese, Vietnamese, Thai, Turkish, Lebanese, Cantonese, Nepalese, or Japanese restaurants,

burger restaurant, fish & chip shop, kebab house, fried chicken take-away or any other use with a high level of fried food.

3.7 It is the intention and preference of the applicant to ensure a bar / restaurant type business occupies the proposed unit. In any case, once an occupier is identified, a suitable odour abatement system will be specified. If the end user of the unit is any of the kitchen types described in paragraph 3.6, then an abatement system meeting the requirements set out in paragraph 3.3 will be installed. If the end user of the unit is any of the kitchen types described in paragraph 3.7, then an abatement system meeting the requirements set out in paragraph 3.4 will be installed.

3.8 Any future change of tenant from a low-risk to high-risk kitchen type will involve an upgrade to the odour abatement system to meet the requirements of paragraph 3.4.

Annex C – Details on Electrostatic Precipitator

Electrostatic Precipitation (ESP) Filter Unit



Technical and Operations Manual

For Models: ESP 1500EI
ESP 3000EI
ESP 4500EI
ESP 6000EI

Using this Manual

This manual is intended to be used as a work of reference for professional, well trained and authorised users to assist them to safely install, use, maintain and repair the Unit mentioned on the cover of this document.

Please note that it is strongly recommended training be given by Purified Air Limited prior to operatives attempting to carry out maintenance or repair work on these Units.

Copyright Statement

All rights reserved

No part of this publication may be copied or published by means of printing, photocopying, microfilm or otherwise without prior written consent of the manufacturer. This restriction also applies to the corresponding drawings and diagrams.

The information given in this manual has been collected for the general convenience of our clients. It has been based on general data pertaining to construction material properties and working methods known to us at the time of issue of the document and is therefore subject at any time to change or amendment and the right to change or amend is hereby expressly reserved. The instructions in this publication only serve as a guideline for installation, use, maintenance and repair of the models mentioned on the cover page of this document.

This manual is to be used for the standard models of the Unit of the types given on the cover page. Thus the manufacturer cannot be held responsible for any damage resulting from the application of this manual to the version actually delivered to you.

This manual has been written with great care. However, the manufacturer cannot be held responsible, either for any errors occurring in this manual or their consequences.

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1. Safety

1.1 Introduction

Everyone working on or with the Unit must be familiar with the contents of this manual and must strictly observe the instructions herein.

The Management should instruct personnel in accordance with this manual and observe all instructions and directions given herein.

Note: Always follow the steps for any instructions in this manual in the order given.

Always keep this manual with the Unit.

The user of the Unit is always fully responsible for observing all applicable local safety instructions and regulations.

Specific working conditions or selected accessories may require additional safety instructions. Contact your supplier immediately if you detect a potential danger when using the Unit.

1.2 Safety Warnings and Instructions

The following symbols and notifications are used in this manual:



WARNING!

Used to warn of a risk of injury or death.



WARNING! - DANGER OF ELECTRIC SHOCK!

Used to warn of a risk of injury or death from electric shock.



CAUTION

Used to caution of a risk of damage to equipment.



INFORMATION

Important information or useful hints about usage.



RECYCLING

Recycling information.



WEEE REGULATIONS

Ensure that waste electrical equipment is disposed of correctly.

1.3 Pictograms, Warnings and Instructions Displayed on the Unit

The pictograms, warning and instructions attached to the Unit are part of the safety features.

They must not be covered or removed and must be present and legible during the entire life of the Unit.

- Immediately replace or repair damaged or illegible pictograms, warnings and instructions.

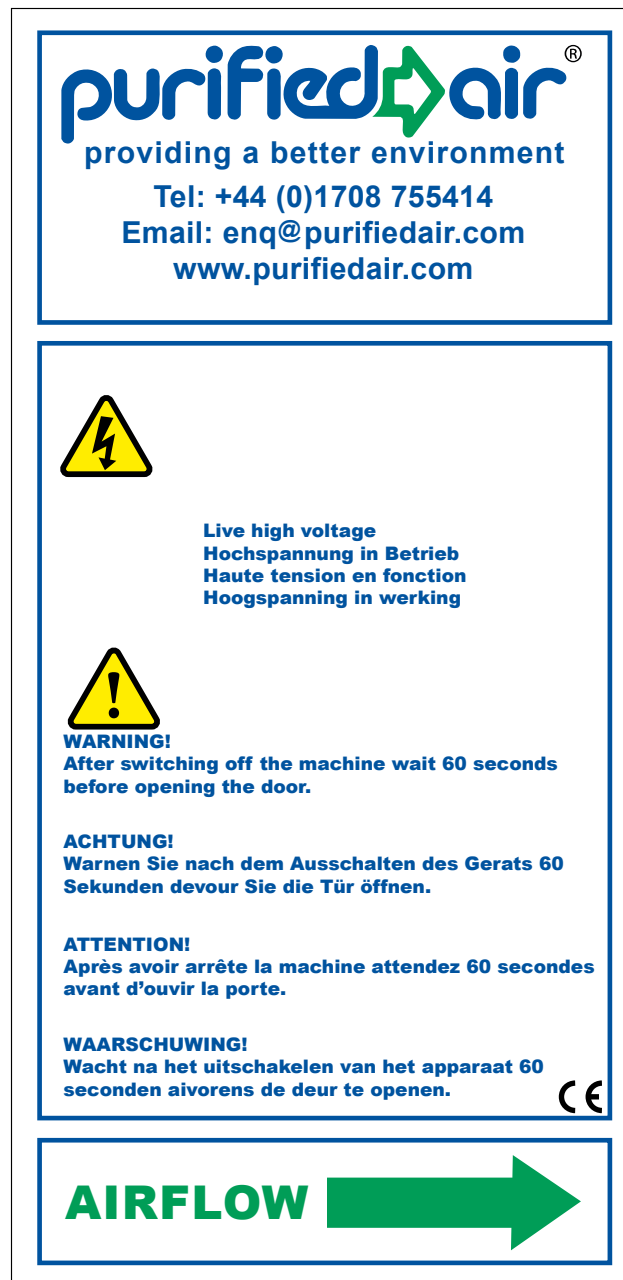


Figure 1 - Unit Label

1.4 Safety Features

An Interlock in the Unit's Door Assembly interrupts the mains power if the main filter compartment is opened before the mains power has been isolated.



CAUTION

All safety features must be correctly installed and can only be removed for maintenance and repair tasks by skilled and authorised service engineers.

The Unit must not be used if the safety features are not fully present or defective.

The safety features should be regularly checked to ensure that they are functioning correctly and, if defective, should be repaired immediately.

1.5 Safety Warnings and Cautions



WARNING! RISK OF EXPLOSION!

The Unit is not explosion-proof rated. It can cause sparks and should therefore not be used in areas with an explosion risk.



WARNING! Fire Hazard!

Never use the Unit for extracting and/or filtering inflammable, glowing or burning particles or solids or liquids.

Never use the Unit for extracting and/or filtering of aggressive fumes (such as hydrochloric acid) or sharp particles.



WARNING!

Ozone (O₃) is produced by the Unit. Ozone can be poisonous at low concentrations.



Inhalation of ozone causes dryness of the mouth, coughing and irritates the nose, throat, and chest.

It may cause difficulty in breathing, headaches and fatigue, and could aggravate existing bronchial conditions including asthma. The characteristic sharp, irritating odour is readily detectable at low concentrations (0.01 to 0.05 ppm).

The Unit must not be operated without the kitchen's extractor fan(s) running.



WARNING! - DANGER OF ELECTRIC SHOCK!

To avoid electric shock:

Do not operate Unit without a proper electrical ground/earth.

Always disconnect power to the Unit and isolate the Unit, before performing any service or maintenance.

Do not operate the Unit if its power cables are damaged or if any other damage to the Unit is visible or suspected.

The supplied utility/mains power must match the power requirements listed on the Unit's rating label.



CAUTION

Regularly inspect the Unit and check it for damage.

Verify the correct functioning of all of the safety features.

Read and save all notices, warnings and safety instructions received with this Unit.

Do not alter the construction or design of this Unit.

Do not remove safety labels or devices.

Do not use this equipment for other than its intended purpose, as described in this manual.

Only use original spare parts.



CAUTION

Make sure the room is always sufficiently ventilated, particularly in smaller, confined areas.

Do not use the Unit at a relative humidity exceeding 75%.

Do not use the Unit at temperatures below -10°C or above 60°C.

Keep the operating controls free from dirt and grease.

Check the working environment. Do not allow unauthorised persons to enter the working environment.

Use common sense. Stay alert and pay attention to your work. Do not use the Unit when you are tired or under the influence of drugs, alcohol or medicine.

1.6 Modifications

Modification of the Unit is not permitted.

1.7 Users

Installation or maintenance of the Unit is exclusively reserved for authorised, trained and qualified users.

Temporary personnel and trainees should only access the Unit under the supervision and responsibility of the authorised, trained and qualified users.

1.8 Technical Specifications

There are currently four models in the range:

- ESP 1500EI, which contains a single ESP Collector Cell.
- ESP 3000EI, which contains two ESP Collector Cells.
- ESP 4500EI, which contains three ESP Collector Cells.
- ESP 6000EI, which contains four ESP Collector Cells.

The specification of each model is detailed below:

	ESP 1500EI	ESP 3000EI	ESP 4500EI	ESP 6000EI
Power consumption	20 Watts	30 Watts	40 Watts	50 Watts
Maximum air handling capacity	Up to 0.7m ³ /sec	Up to 1.4m ³ /sec	Up to 2.1m ³ /sec	Up to 2.8m ³ /sec
Dimensions	W 450mm H 630mm D 640mm	W 900mm H 630mm D 640mm	W 1350mm H 630mm D 640mm	W 1800mm H 630mm D 640mm
Weight	55kg	85kg	118kg	153kg
Power supply	220/240V 50Hz 1ph	220/240V 50Hz 1ph	220/240V 50Hz 1ph	220/240V 50Hz 1ph
Filter efficiency	Up to 98%	Up to 98%	Up to 98%	Up to 98%
Housing	Epoxy-coated galvanised steel	Epoxy-coated galvanised steel	Epoxy-coated galvanised steel	Epoxy-coated galvanised steel

1.8.1 Rating Plates

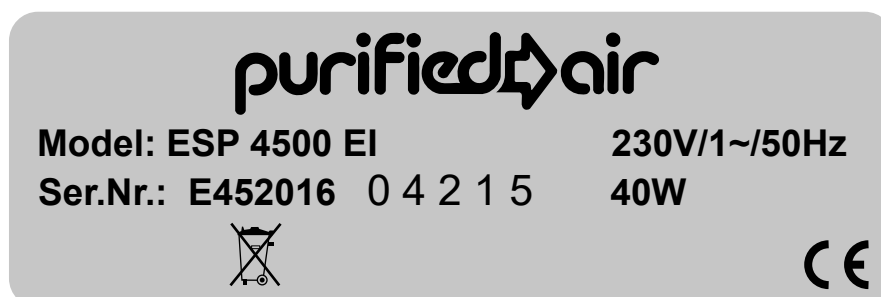
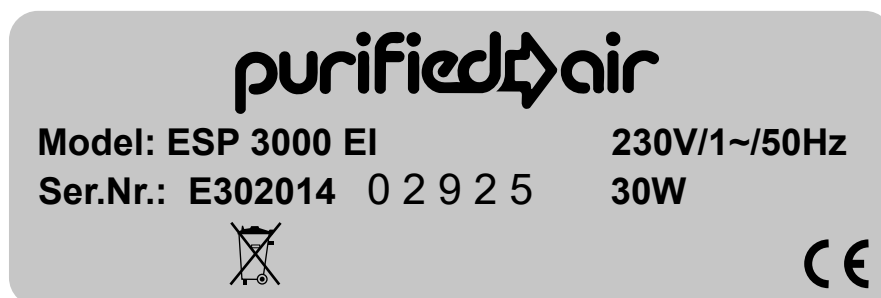
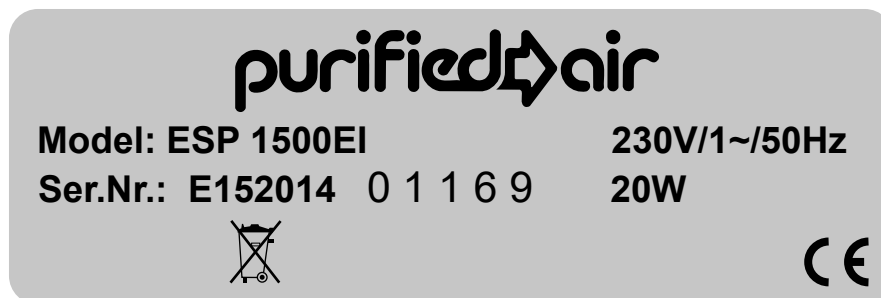


Figure 2 - Rating Plates for Each Model

2. Product Overview

2.1 Intended Use

The Electrostatic Precipitator (ESP) models covered by this manual have been designed primarily for filtering the extract air from commercial kitchens and have various specific features to suit that purpose.

Note: Though they can also be used for air filtration in other commercial and industrial applications where a high degree of filtration is needed, before considering alternative uses, please check with the manufacturer to confirm that your Unit will be suitable for its intended use.



CAUTION

No liability is accepted for damage or injury which results from any alternative use which has not been verified in writing by the manufacturer.

Using the Unit for alternative uses not approved in writing by the manufacturer is considered contrary to its intended use.

The Unit has been built in accordance with state-of-the-art standards and recognised safety regulations.

Individual Units can be mounted together in various combinations to satisfy the requirements of a particular installation.



CAUTION

Only use the Unit:

If it is not damaged in any way.

After following the instructions laid down in this manual.



Figure 3 - ESP Filter Unit (Model ESP 4500EI)

2.2 Features

The following features are applicable to all four models covered by this manual:

- They can be installed outside without an additional weather housing.
The Unit's casings is fully weatherproofed, with the Main Door components having an IP Rating of 64 and the Door Assemblies themselves being tightly sealed to the main chassis.
- The ionisation voltage runs at a negative potential which enhances both the ionisation of particles and their consequent precipitation and the production of ozone which helps eliminate odours in a kitchen environment.
- A high degree of efficiency, with power consumption between 20 Watts and 50 Watts, depending on the model.
- The Unit can be linked to a Building Management System (BMS) via a suitable relay mounted on the DIN rail (See: *Connecting the Unit to a Building Management System on page 21*).
- All internal components are designed for easy removal.
- The Mesh Filters (Pre and Post) are designed to drain independently and the Collector Cell is designed to be efficient, robust and effective.
- The Collector Cells and Filter Carriers can be easily removed for cleaning.
- The Collector Cells can be fitted with ionisation wires or with stainless steel spiked ioniser blades.
- All internal surfaces are as smooth and as free from screw and rivet heads as practically possible to allow for ease of cleaning.
- Fully welded sumps prevent leakage of collected grease. The inward sloping edges of the sumps encourage the flow of grease away from both the ducting and either side of the Unit.
- The Door Assemblies are designed to allow the Unit to be quickly reconfigured for different airflow directions.

2.3 Operating Principles

Commercial kitchen exhaust pollution is composed of two distinct phases:

- The particulate phase; oil, smoke and grease particles.
- The gaseous or odour phase.

2.3.1 Oil, Smoke and Grease Filtration

The primary function of Purified Air's range of Electrostatic Precipitators (ESPs) is to effectively filter the particulate phase (oil, smoke and grease) of extracted kitchen fumes.

The Unit covered by this manual utilises an ionisation process to filter particulates in the exhaust down to a sub-micron level, with an efficiency of up to 98% when fitted correctly.

The ESP Filters have been exclusively designed for filtering extracted kitchen fumes and have integral sumps built in to collect the oil and grease particles. This not only simplifies servicing but eradicates potentially dangerous spillage from the bottom of the Unit.

The entire range fits in-line with the kitchen's ducting and the modular layout allows additional Units to be easily added to cope with all kitchen fume extraction requirements.

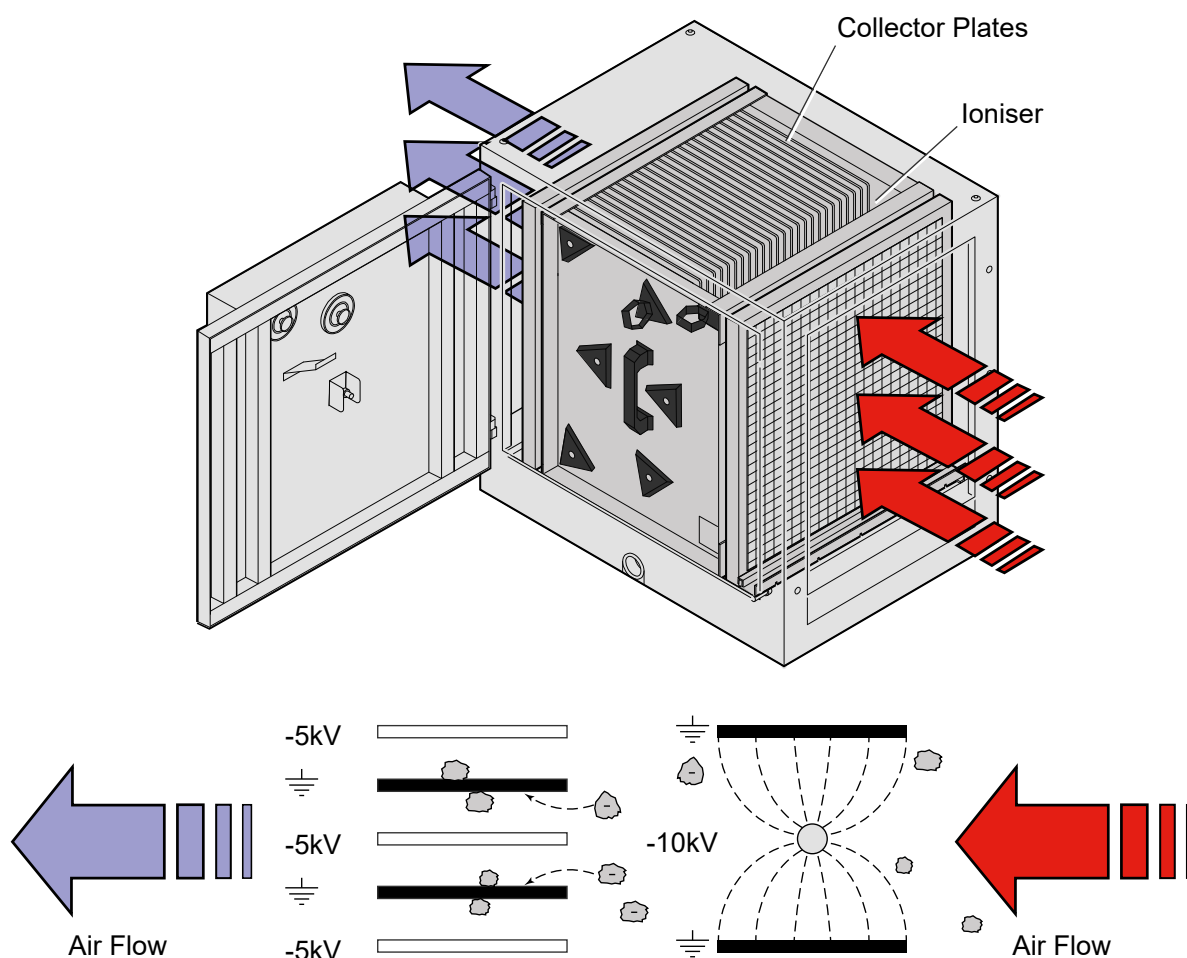


Figure 4 - Electrostatic Precipitator (ESP) - Operating Principles

Figure 4 (above) shows, in simple terms, how an electrostatic precipitator functions and this is summarised below:

1. The air first passes through a pre-filter.
2. The air then passes into the combined Collector Cell/Ioniser section where the particulates in the air stream are charged to a negative potential.
3. The negatively ionised air then passes between the Collector Cell's plates, which are alternatively negatively charged or earthed.
4. The negatively charged particulates passing through the plates are then simultaneously repelled away from the negatively charged plates and attracted to the earthed plates, where they stick, effectively filtering them from the airflow.
5. The particulates remain on the plates or drain down in to the sump (hence the need for regular cleaning).
6. The cleaned air exits through a post filter.

2.3.2 Odour Control

Ozone is produced as a function of the charging of the Collector Cell's plates in Purified Air's range of Electrostatic Precipitators. This helps to combat the gaseous or odour phase of kitchen exhaust pollution.

However, for total control of the gaseous phase, Purified Air also manufactures and distributes a range of Ultra Violet equipment and Ozone Generators as well as our Odour Neutraliser, the ON100.

Note: We also supply a full range of passive filtration equipment, including Activated Carbon, Baffle, Mesh, HEPA, Bag and Panel filters.

2.4 Electrostatic Precipitator Unit - Components

All models of Electrostatic Precipitator Unit comprise a Main Chassis with a number of removable components, a Main Door and an Electrical Housing Door.

2.4.1 Main Chassis

The Main Chassis contains the removable Collector Cell, Filter Carrier, Pre and Post Mesh Filters and non-removable, fully welded, Sump with Drain Plug.

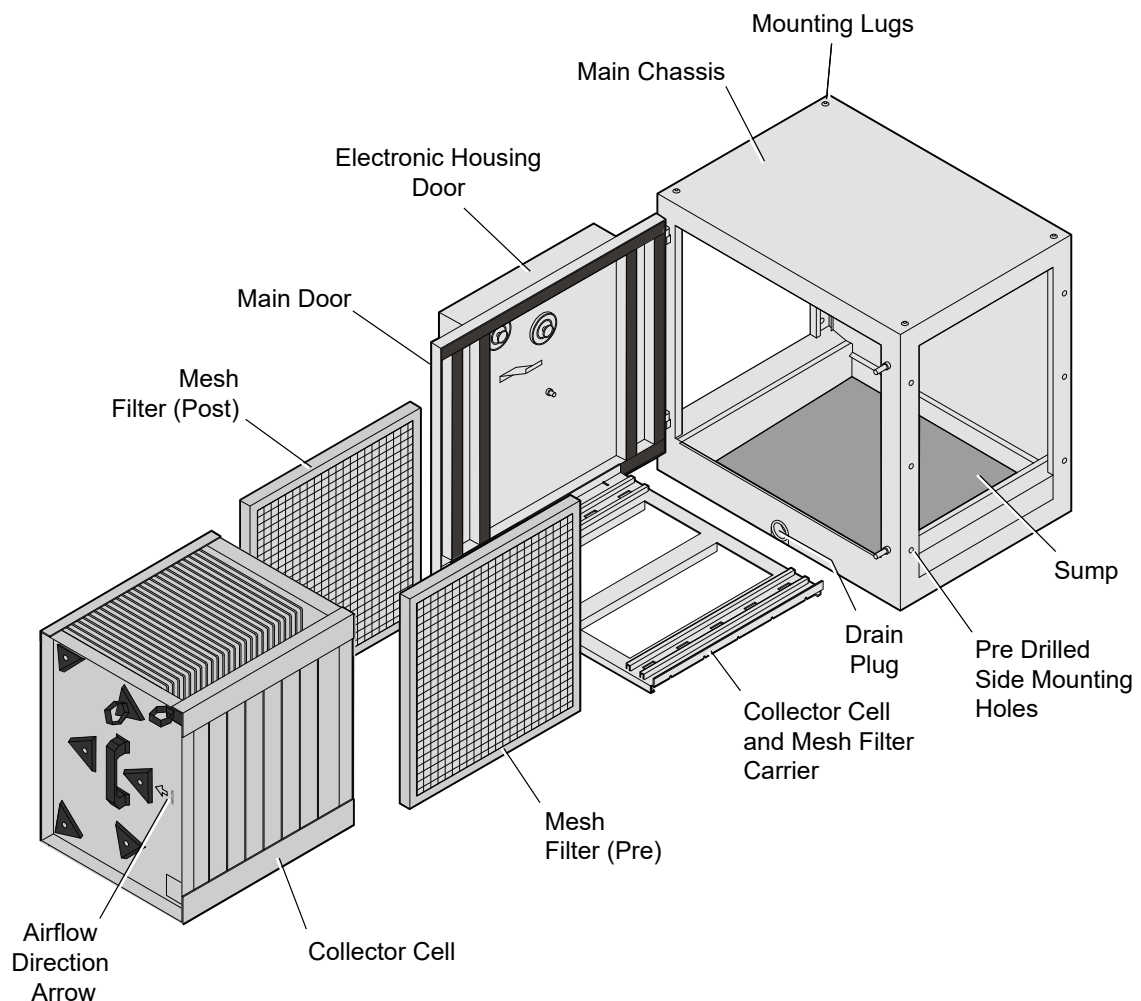


Figure 5 - Electrostatic Precipitator Unit - Main Chassis Components

2.4.2 Main and Electrical Housing Door Assemblies

The Main Door has an Electrical Housing Door which contains the High Voltage Power Supply (HVPS) and control elements. On the front of the Electrical Housing Door are mounted the Rotary Mains Isolator Switch and green Run Light Indicator.

The Main Door can be hung either way up to allow the Unit to be handed for different airflow directions.

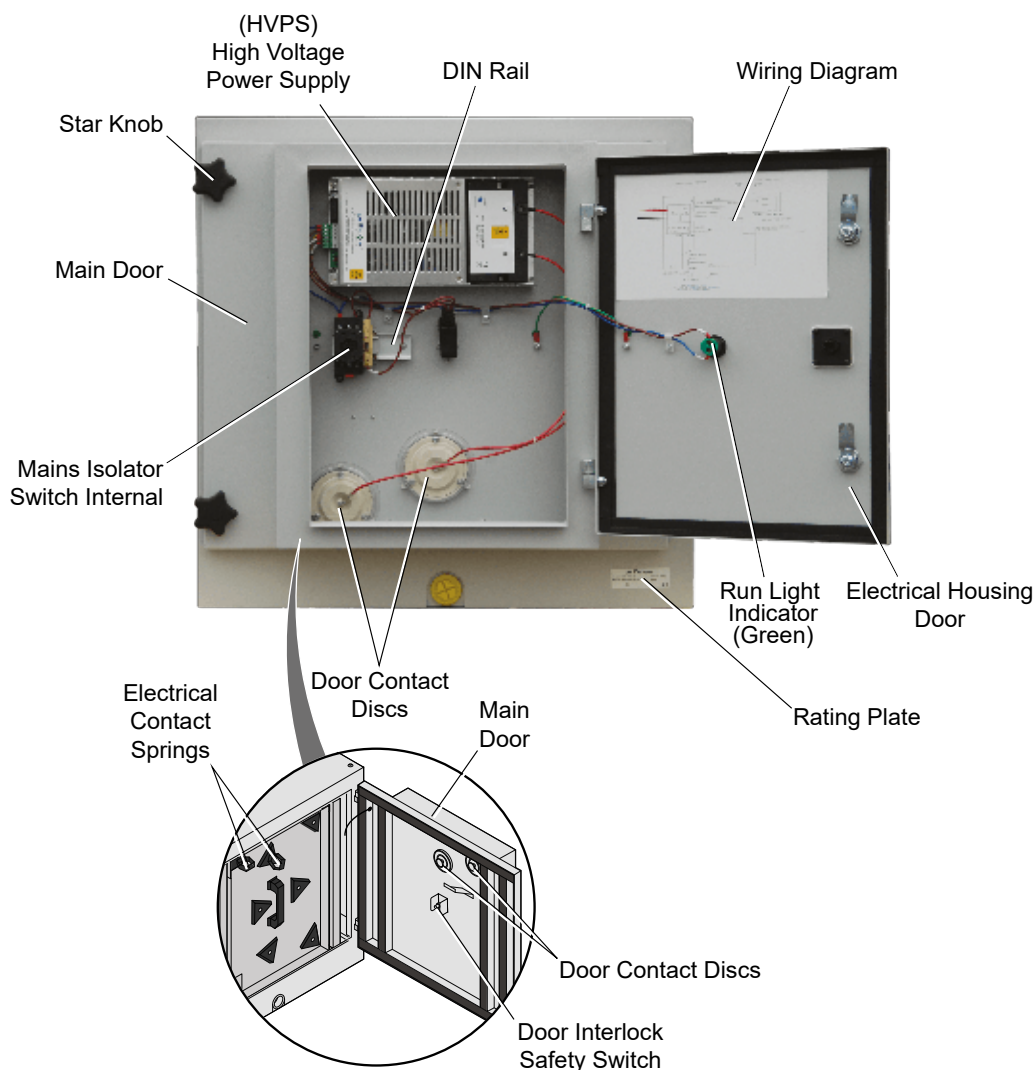


Figure 6 - Door Assemblies

3. Storage, Unpacking and Handling

3.1 Storage

Prior to installation, each ESP Filtration Unit must be stored in its original packaging in dry conditions.

3.2 Shipping List

Each Unit is shipped with the following:

- ESP Filter components - Mesh Filters and Collector Cells.
- This Technical and Operations Manual.

3.3 Unpacking and Handling

Before installing:

1. Strip away all packaging, wrapping and strapping (this must only be done by trained, professional installers).
2. Open the Unit and carefully remove all Mesh Filters and Collector Cells and place in a safe and secure position, away from the installation area.

This operation will greatly reduce the weight of the Unit and allow much easier installation.

3. Once the Unit have been successfully installed, carefully replace the Mesh filters and Collector Cells, ready for commissioning.



WARNING!

The Unit is heavy and the appropriate lifting and handling practices must be observed, for both unpacking and installation, to avoid personal injury or damage to the equipment.

See the Technical Specifications for Unit weights.

4. Installation Guidance

4.1 Overview

Installation should be carried out by a trained professional installer.

As installations vary widely depending on the specific site requirements, this section only provides general guidance for the installer.

If in any doubt, contact Purified Air Limited.

4.2 Model Dimensions

The dimensions, and the necessary service space required at the front of the Unit, are detailed opposite for each model.

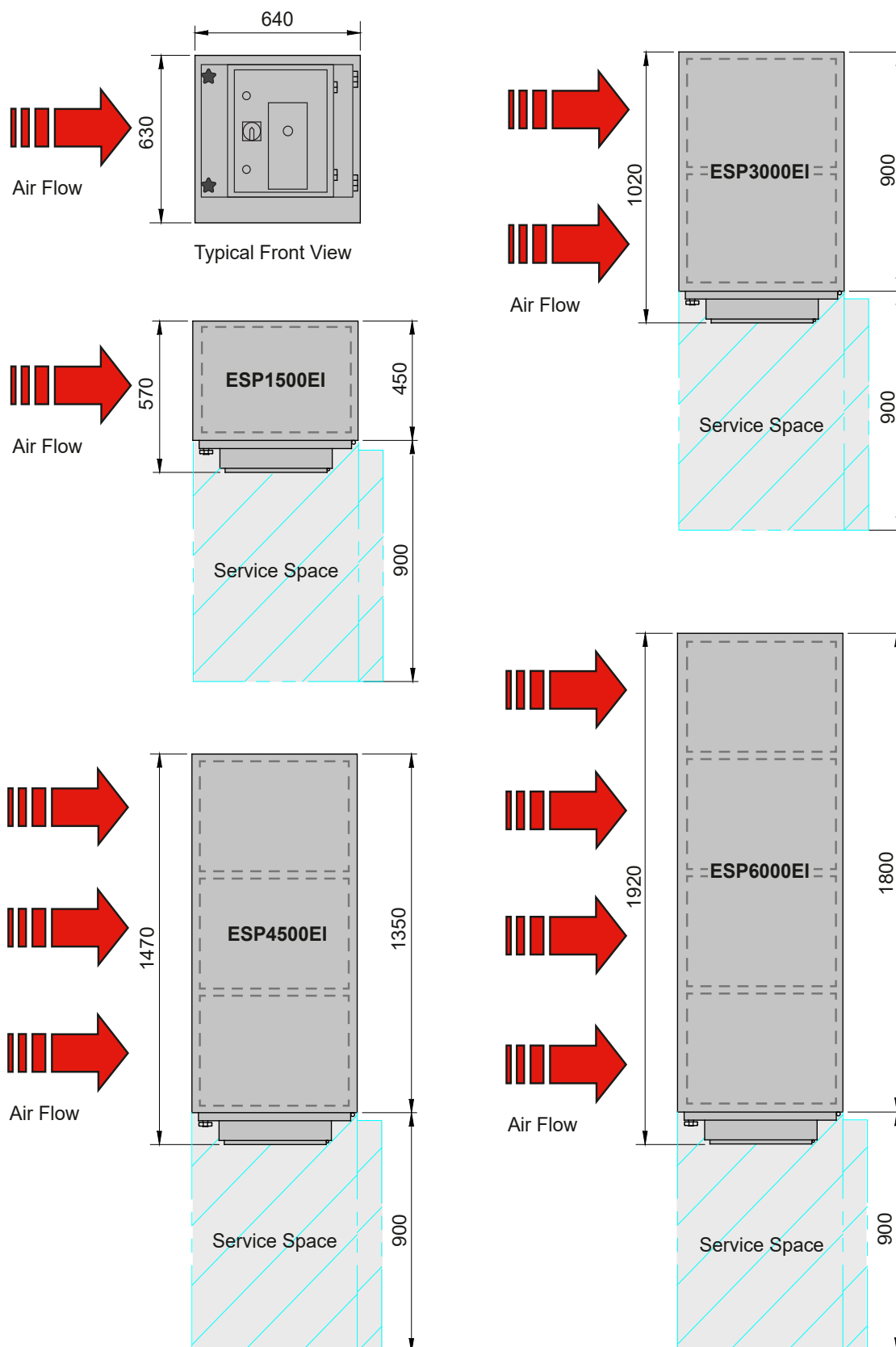


Figure 7 - Model Dimensions - ESP 1500EI, ESP 3000EI, ESP 4500EI and ESP 6000EI
(All Dimensions in Millimetres)

4.3 Pressure Loss Graphs

Any equipment added to a duct system will cause a drop in air pressure in the duct system, downstream of the added equipment.

To ensure that the duct system performs as expected, please note the Pressure Loss Graphs for each of the models:

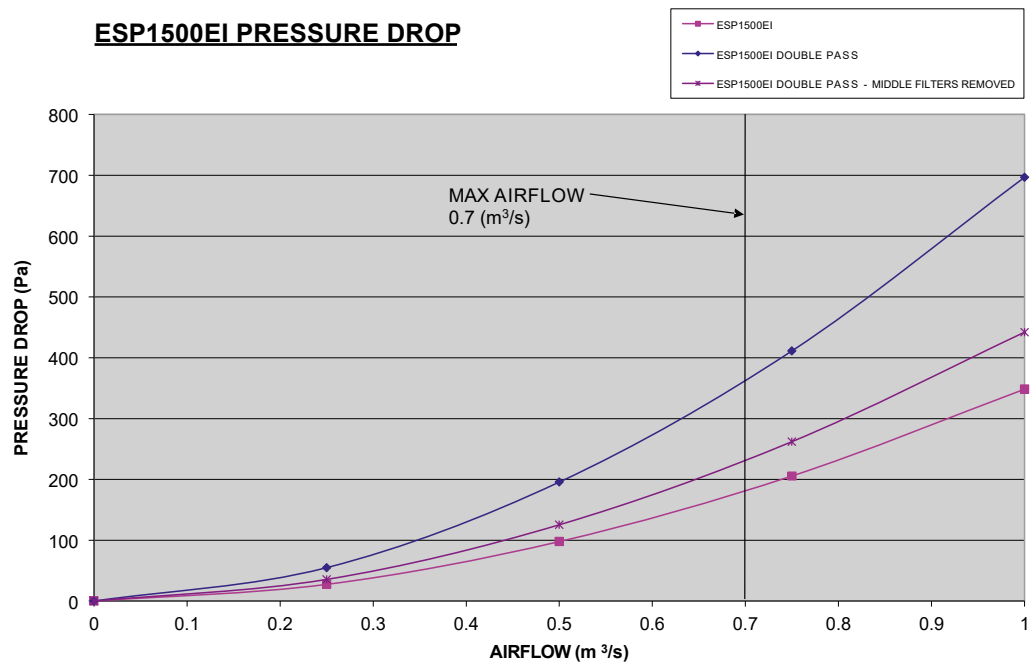


Figure 8 - Graph of ESP 1500EI Pressure Drop

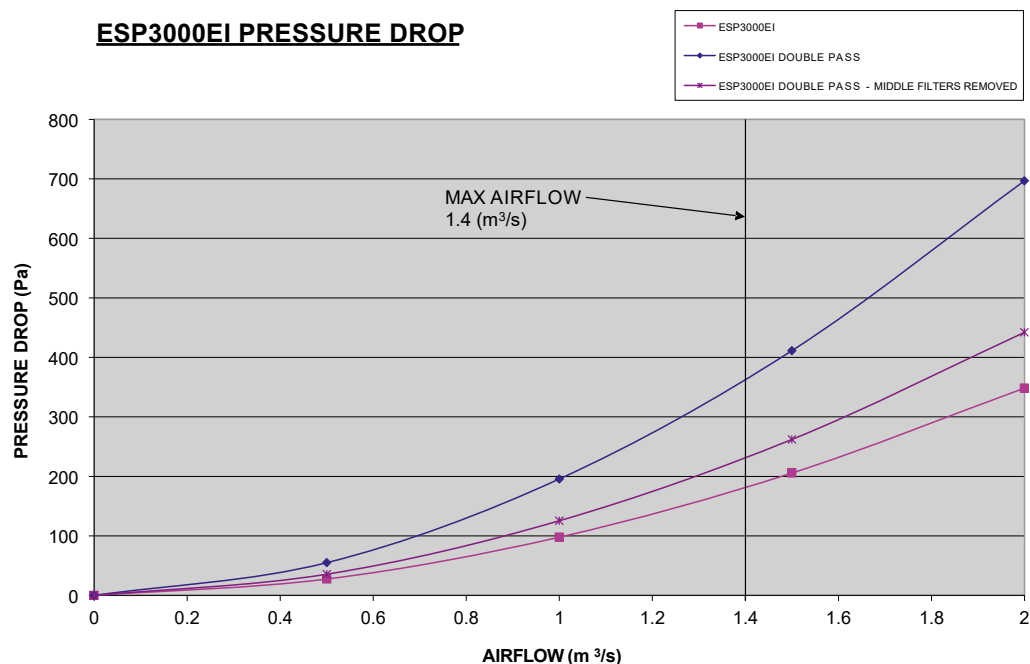


Figure 9 - Graph of ESP 3000EI Pressure Drop

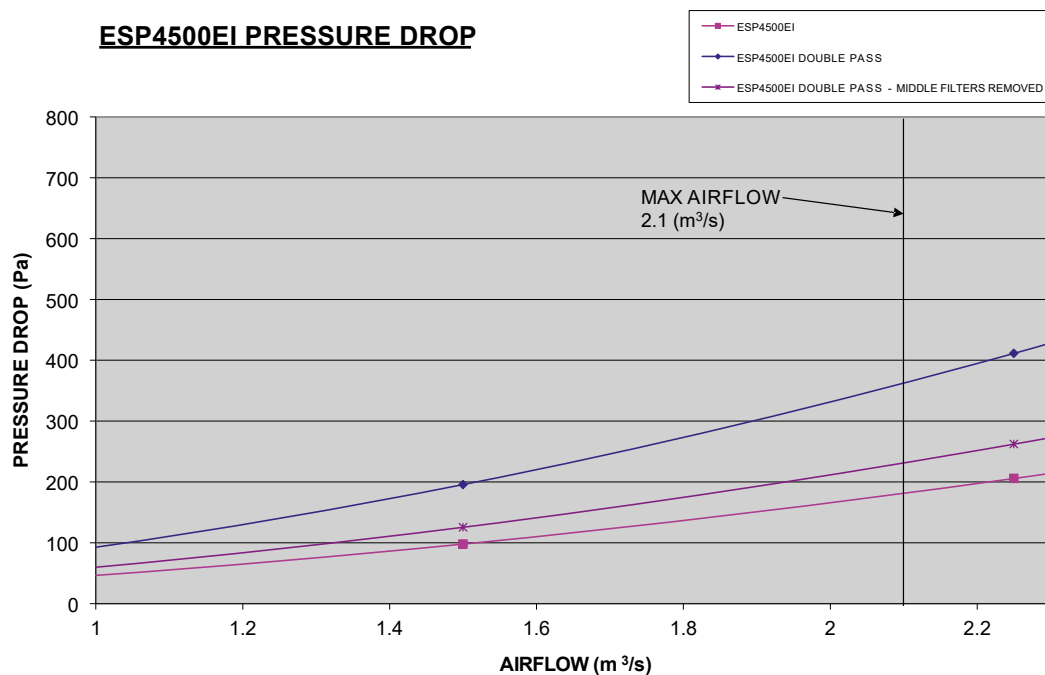


Figure 10 - Graph of ESP 4500EI Pressure Drop

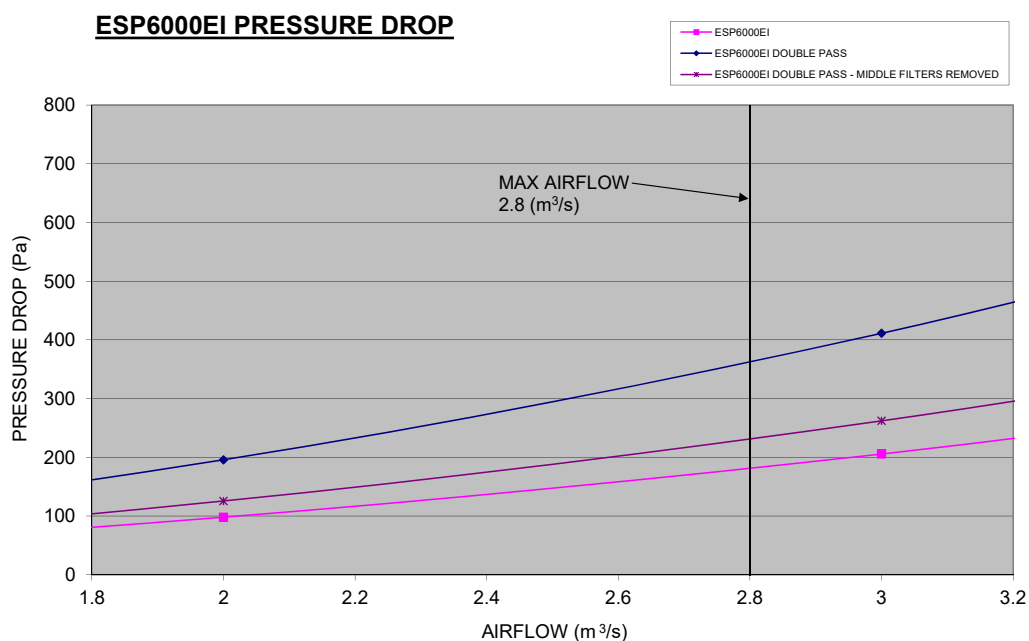


Figure 11 - Graph of ESP 6000EI Pressure Drop

4.4 Installing Single Units

When installing a single Unit, please note the following:

- The Unit should be positioned as close to the cooking source as possible, but please ensure that the fume temperature will never exceed the maximum operational temperature of the Unit, i.e. 60°C.
- Ensure that there is adequate service space around the Unit to enable the removal of the Unit's components.
- Ensure that there is adequate and safe access for servicing and maintaining the Unit.
- Check that the supporting structure is adequate for the weight of the Unit prior to installation. See Technical Specifications for Unit weights.
- The Unit should be mounted in the ducting system.
- The Unit can either be supported by a suspension bracket or suspended by screw rods attached to the top of the Unit. Suspension by screw rods will necessitate drilling holes in the top of the Unit's housing for this purpose.
- The Unit can also be placed on the ground, providing a suitable frame is placed in between the Unit and the floor to allow the system to be drained properly.

We suggest that this frame has a minimum height of 150mm and that you use suitable rubber or neoprene insulation between the Unit and the frame.

- The ducting should be fabricated to ensure as straight and even an airflow as possible, prior to entry into the Unit.
Turbulent air or air directed to one side of the Unit will make the Unit less efficient.

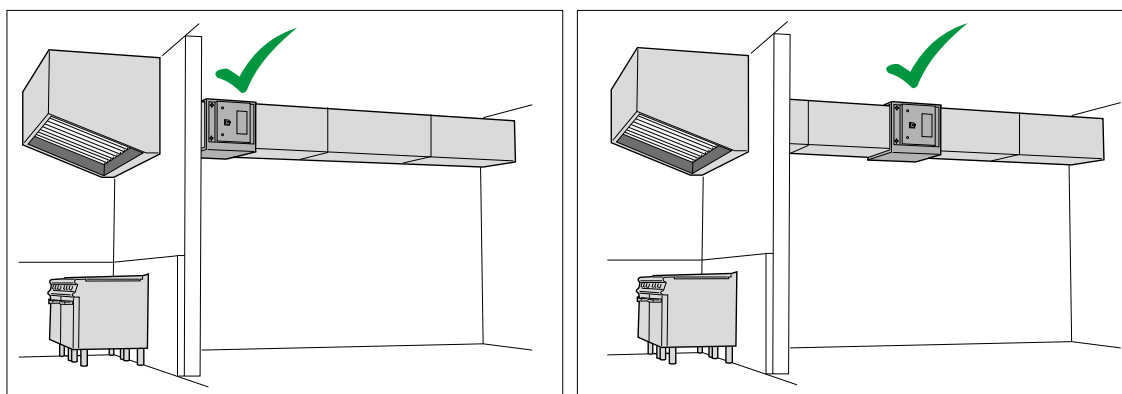


Figure 12 - Preferred Mounting of Filter Unit

Please consult the Wiring Diagram, mounted on the inside of the Door Assembly and shown on page 33 of this manual, when connecting the Unit to the mains. Beware of possible differences in the mains power supply.



INFORMATION

The ESP filter must be interfaced with the extraction fan so that they run in conjunction.

4.5 Installing Multiple Units

Multiple Units can be mounted in series, both vertically or horizontally or in parallel with each other.

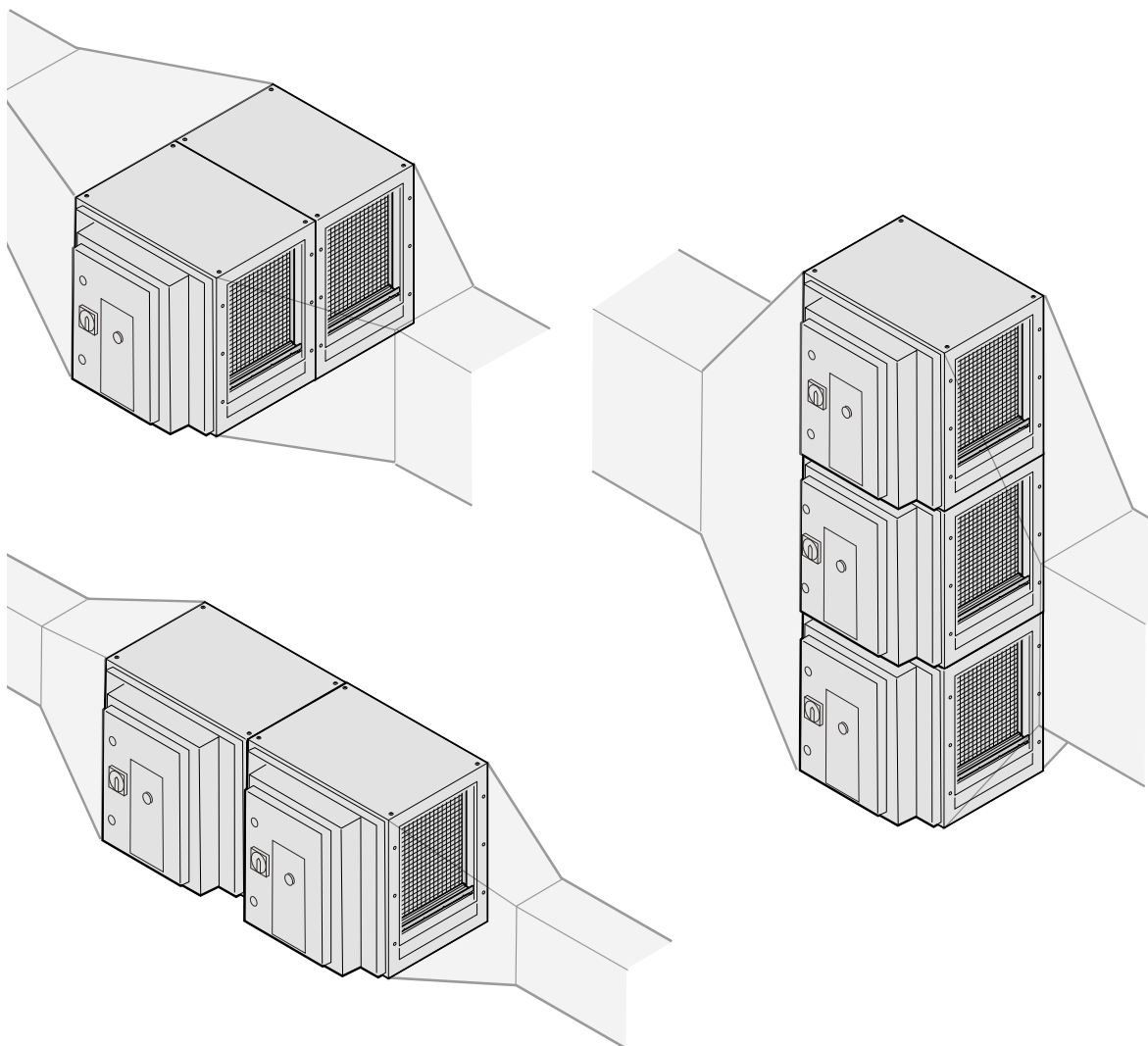


Figure 13 - Multiple Unit Installation Examples

When mounting multiple Units, please note the guidance for installing a single Unit and also note the following:

- The side flanges are pre-drilled to allow combinations of Units to be easily aligned and connected together.
- Locating lugs are also provided on the top of the Units to allow the vertical stacking and connection of combinations of Units. Up to four Units can be stacked on top of each other.



INFORMATION

Never install Units in front of entrances and exits which may be used by the emergency services.

4.6 Changing Airflow Direction / Re-Handling Unit

The ESP can be configured to allow airflow in either direction, i.e. air entering the Unit from the left or right hand side to take account of space constraints or the existing infrastructure.

The following tools will be required to change the airflow's direction:

- 7mm spanner or socket.
- Small adjustable spanner.
- 14 or 13mm socket depending on model.
- Cross head screwdriver.
- Pair of pliers.
- Optionally, a portable electric drill with a socket attachment.

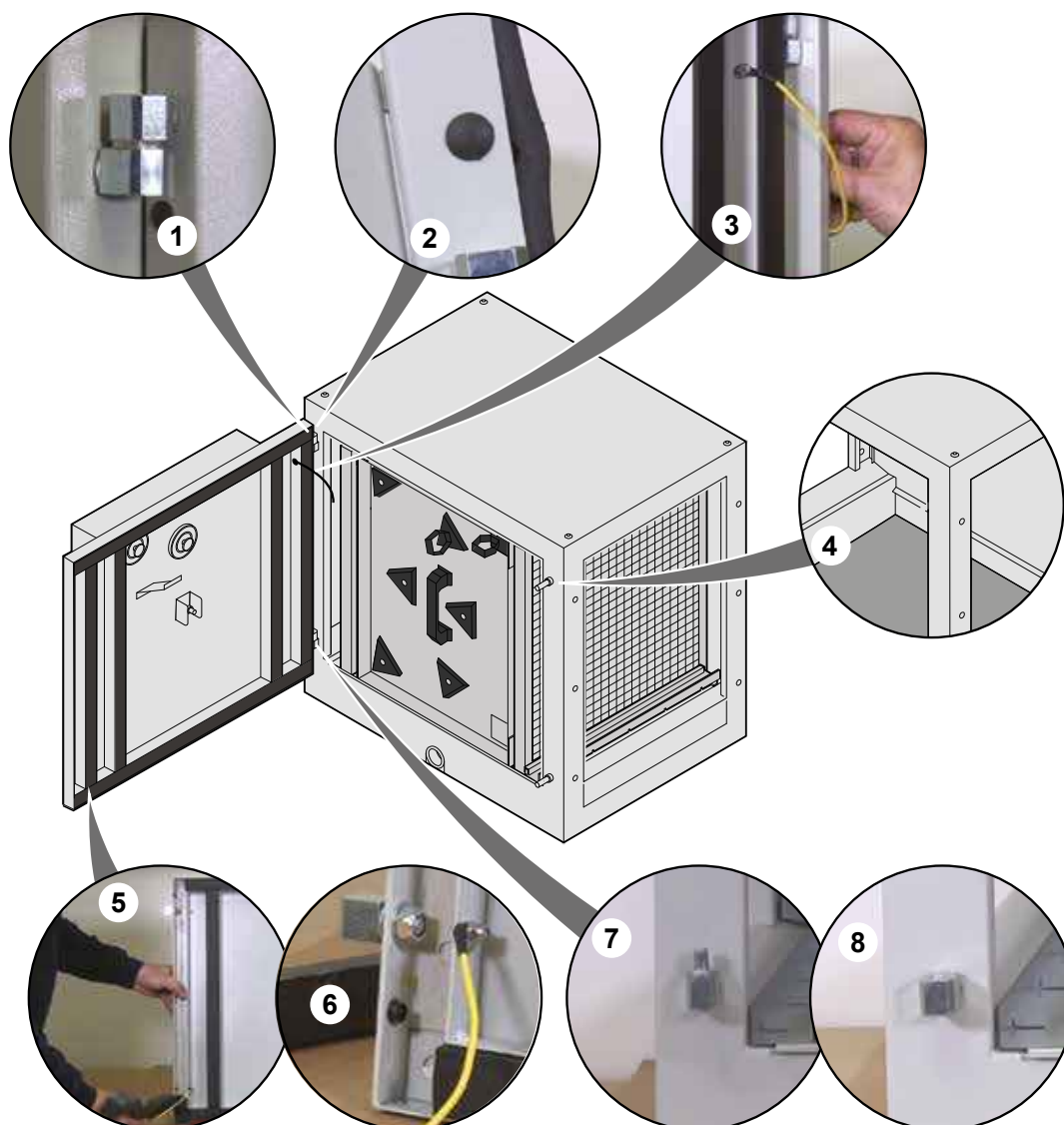


Figure 14 - Re-Handling Process Components

To change the airflow direction:

1. Fully undo the two Star Knobs ❹ (anti-clockwise) and open the Main Door.
2. Remove the Mesh Filters (pre and post), followed by the Collector Cell.
3. Remove the Earth Connection ❸ from the Main Chassis using a 7mm spanner.
4. Lift the Door Assembly off the Two Part Hinge ❶, taking care not to drop the hinge pins ❷ and washers.
5. Remove the hinge pins and washers and put somewhere safe.
6. Put the Door Assembly in a safe place.
7. Undo the Hinge Blocks ❸ using a combination of a 13/14mm socket and adjustable spanner and remove from the Main Chassis.
8. Remove the Threaded Rods ❹ that the Star Knobs were attached to, from the other side of the door aperture, using a deep 13/14mm socket or portable drill with the same attached.



INFORMATION

Note that the two sets of holes on either side of the door aperture are identical.

9. Install the Threaded Rods ❹ and Hinge Blocks ❸ on the opposite sides of the door aperture to their original locations, ensuring that the hinge pin location holes on the hinge blocks face upwards.
10. Turn the Door Assembly through 180° i.e. turn upside down.
11. Remove the Door Assembly Sealing Strip/Rubber Seal ❺.
12. Remove the Grommets ❷ from the holes near the Hinge Blocks ❸.
13. Remove the Hinge Blocks ❸ using a combination of an adjustable spanner and pliers.
14. Replace the Hinge Blocks ❸ into the holes previously occupied by the Grommets ❷, making sure that the hinge pin location holes on both hinge blocks point downwards.
15. Refit the Grommets ❷ into the holes left by the hinge blocks.
16. Relocate the Earth Connections ❸ to the top of the door's frame using either a screwdriver or pliers depending on the model.
17. Replace the Sealing Strip/Rubber Seal ❺.
18. Locate the Hinge Pins ❷ into the hinge pin location holes in the Hinge Blocks ❸ on the main body of the Unit.
19. Rehang the Door Assembly.
20. Re-attach the Earth Connection ❸ to the main body of the Unit.
21. Turn the Collector Cell through 180° (i.e. turn upside down to match the new orientation of the door) and replace in the Unit followed by the Mesh Filters (pre and post).
22. Ensure that the Collector Cell's spring electrical contacts line up with the electrical contact discs on the Door Assembly.

23. Remove the label from the door and replace with a new one in the correct orientation having first cleaned the door's surface.
It will be easier to adjust the new label's location if the door's surface is first wiped over with a slightly wet cloth before the label is attached. Once the water has dried, the correctly located label can be smoothed down.
24. Re-orientate the Rotary Mains Isolator Switch by removing the centre fixing screw and the red cover. Turn the red cover through 180°, replace it on the square centre shaft and secure with the fixing screw.
25. Follow the instructions listed in Operation and Control on page 22 to test the correct functioning of the Unit.

**INFORMATION**

For additional information, please see the video showing how to change the airflow's direction on the Purified Air website:

www.purifiedair.com

4.7 Connecting the Unit to a Building Management System

The Unit can be connected to a Building Management System (BMS).

- In order to complete this connection, a BMS Connection Kit must be purchased as a separate item.
- Connect the BMS to the Unit using the relay provided on the DIN rail in the Door Assembly.
- Refer to the Wiring Diagram on page 33 for details on how to connect the Unit to a BMS.

**INFORMATION**

Note that the BMS connection will only provide a Run or Fault signal.

5. Operation and Control

5.1 Control Panel

The Control Panel is part of the Electrical Housing Door and contains the Unit's Rotary Mains Isolator Switch and Run Light Indicator.

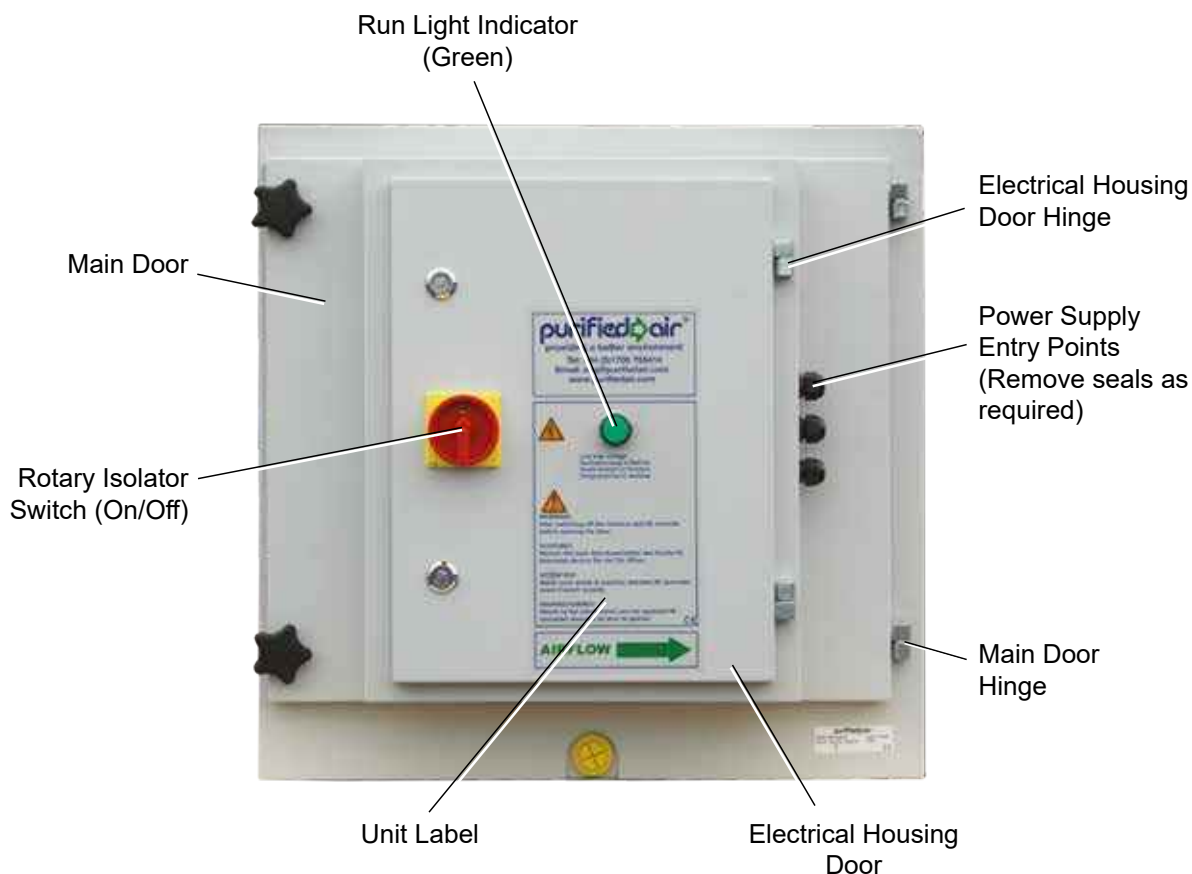


Figure 15 - Control Panel Components

5.2 Before Use

Before use, ensure that all safety precautions have been taken and that environmental conditions are suitable for operation of the Unit (see 1.5 Safety Warnings and Cautions on page 3).

5.3 Switching On

To start the Unit from the Control Panel on the Electrical Housing Door:

1. Turn the Rotary Mains Isolator Switch to the 'On' position.

Note: The green Run Light Indicator will illuminate during normal operation.

Regularly check that the green Run Indicator Lamp is illuminated when using the Unit as it indicates that the electrostatic filter is properly charged.



WARNING

Please contact your service agent if the green Run Light Indicator doesn't illuminate when the Rotary Main Isolator Switch is in the 'On' position.

2. Check that the interfaced extractor fan is also running. Turn off the Unit if this is not the case and investigate further.

5.4 Arcing and Auto-Shutdown

Some arcing within the Unit during operation is normal.

If the problem persists, due to excess debris, the Unit will automatically cycle on and off until the problem clears or until a service visit is carried out.

Note: If excessive arcing occurs, the Unit will automatically shutdown and then restart after a short time.

5.5 Switching Off

To stop the Unit, turn the Rotary Mains Isolator Switch to the 'Off' position.



CAUTION!

After switching off the Unit, wait 60 seconds before opening the door to allow the static electricity charge to dissipate.

6. Fitting Stainless Steel Ioniser Blades

6.1 Fitting Stainless Steel Ioniser Blades to a Collector Cell

Some specifications require solid stainless steel spiked ioniser blades to be fitted, replacing the standard Ioniser Wires.



Figure 16 - Stainless Steel Ioniser Blade

The stainless steel spiked blades are made out of 0.7mm sheet stainless steel with a pressed ridge or spine down the centre.



WARNING!

The Ioniser Blade has sharp points so care should be taken when handling.

This modification can be made in the factory or, alternatively, an engineer can perform the replacement on site.

6.1.1 Replacing Ioniser Wires with Stainless Steel Ioniser Blades on Site

To replace the Ionisers Wires with Stainless Steel Ioniser Blades on site, please see the instructions below:

1. Turn the Rotary Mains Isolator Switch to the 'Off' position and wait for 60 seconds to allow the accumulated static electricity charge to dissipate.
2. Fully undo the two Star Knobs (anti-clockwise) and open the Main Door.
3. Slide out the Pre and Post Filters and, after making a note of the airflow direction arrow, slide out the Collector Cell.
4. Remove the existing Ioniser Wires by unhooking them from the Upper and Lower Ioniser Bars, pulling the unsprung end of each Ioniser Wire against the spring's tension.
Once the Ioniser Wires have been removed from the Collector Cell, there will be eight locating holes in each of the Upper and Lower Ioniser Bars.
5. Take the first Stainless Steel Ioniser Blade and locate its protruding lugs into both the Upper and Lower Ioniser Bars location holes.
6. Once in place, using a pair of long nosed pliers, carefully bend the lug down to secure the top of the Ioniser Blade into position on the Upper Ioniser Bar (see Figure 17 - Fitting Stainless Steel Ioniser Blades on page 25).

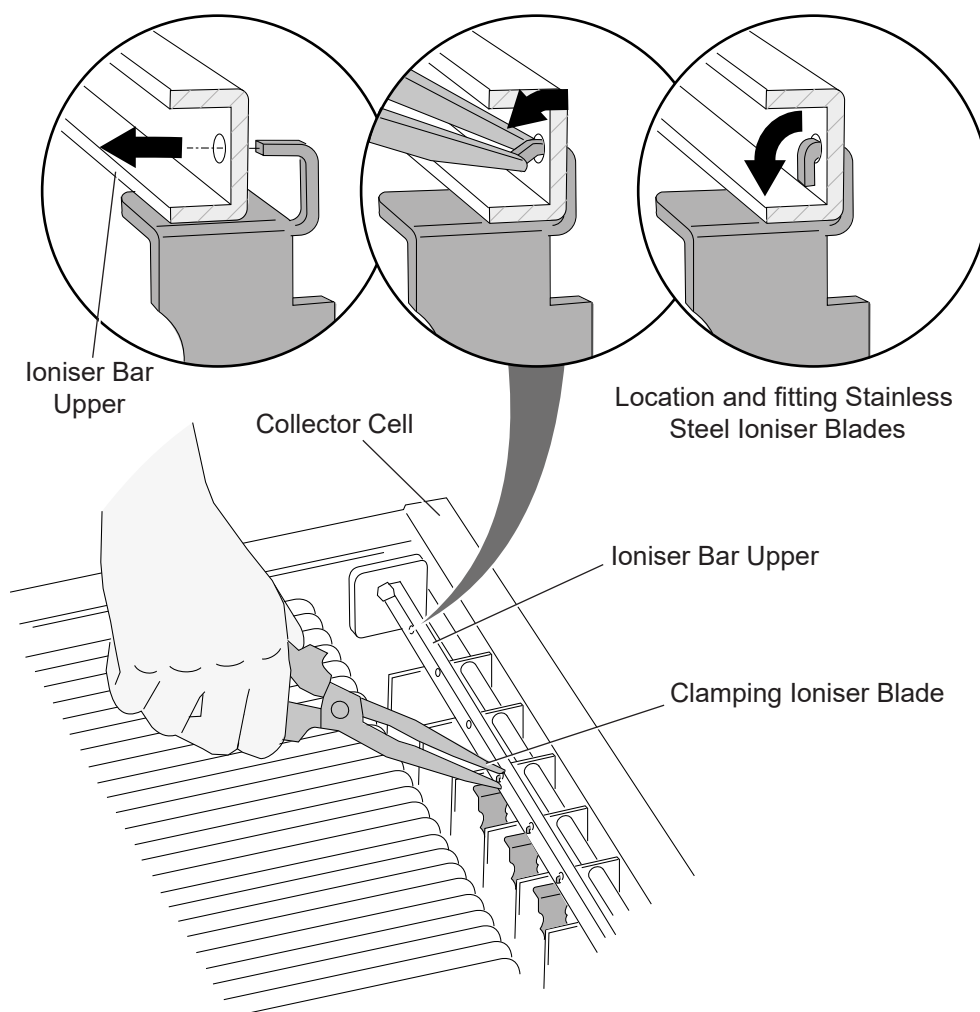


Figure 17 - Fitting Stainless Steel Ioniser Blades

7. Turn the Collector Cell upside down, being careful to keep the Ioniser Blade's lower protruding lug located in the Lower Ioniser Bar's location hole, and carefully bend the lug down to secure the bottom lug of the Ioniser Blade. The blade should now be securely attached to the Collector Cell's Upper and Lower Ioniser Bars.
8. Turn the Collector Cell back upright and repeat the steps 5, 6 and 7 above for each Ioniser Blade until all eight have been securely fitted.

The Collector Cell is now ready to be placed back into the Main Chassis:

1. Replace the Pre and Post Mesh Filters and replace the Collector Cell back into the Main Chassis.
Note: Make sure that the air flow direction arrow, noted in step 3 on page 24, is pointing in the correct direction.
2. Close the Main Door and replace and tighten the two Star Knobs making sure that the Main Door is tightly closed.
3. Turn the Rotary Mains Isolator Switch to the 'On' position.

7. Maintenance and Cleaning

7.1 Introduction

If you carry out the simple cleaning and maintenance described below, at the prescribed intervals, paying attention to the associated Warnings and Cautions, then any problems will mostly be detected and corrected before they result in a total breakdown of the Unit.

The indicated maintenance intervals can vary depending on specific working and local environmental conditions. It is therefore recommended that the Unit is thoroughly inspected annually in addition to the indicated periodic maintenance. Please contact your service agent to arrange this.



WARNING!

Overdue maintenance can lead to fire.

Always switch OFF the Unit and isolate the electric supply before carrying out the activities below.

Do not carry out any service, maintenance or repairs to the Unit before it has been protected against unintended starting by switching off and isolating the electrical supply.

7.2 Maintenance and Cleaning Schedule

Basic maintenance activities can be carried out by the user. Please see the table below for the optimum frequency for such activities.

Note: Other activities are strictly reserved for qualified personnel.

Basic Maintenance Activities	Frequency
Clean the outside of the Unit with mild detergent	Every 6 months
Check the door sealing material (see 7.3.2 on page 27)	Every 12 months
Clean the inside of the Unit and remove dust/ grease from the filter compartment (see 7.3.2 on page 27)	From once a week to once every 3 months depending on the degree of pollution.
Clean the Mesh Pre-filter, ESP Collector Cell and the Mesh Post-filter and check for damage (see 7.3.3 on page 28 and 7.3.4 on page 28)	From once a week to once every 3 months depending on the degree of pollution.

7.3 Cleaning and Maintenance Tasks

Clean or replace the Mesh Filters and Collector Cell and clean the Main Chassis at the prescribed intervals mentioned in Maintenance and Cleaning Schedule on page 26 or:

- If the Mesh Filters and/or Collector Cell are damaged.
- When the Collector Cell starts to make a crackling sound (arcing).
- When the filtering and extraction performance of the Unit starts to decline.

It is a matter of experience to determine when the Unit needs to be cleaned, since the nature and the degree of pollution depends strongly on factors such as the particular location, humidity, and intensity of use etc. Nevertheless, the filters and Main Chassis should be cleaned regularly at intervals ranging from once a week to once every 3 months using the procedures outlined in the sections below:

7.3.1 Removing the Mesh Filters and Collector Cell

Start the cleaning procedure by removing the Mesh Filters and Collector Cell from the Main Chassis:

1. Isolate the Unit from the mains power supply by turning the Rotary Mains Isolator Switch to the 'Off' position.
2. Allow at least 60 seconds for any static electrical charge to dissipate.
3. Double check that the mains power supply has been isolated.
4. Unscrew the top and bottom Star Knobs on the main Door Assembly anti-clockwise and open it.
5. Remove the Mesh Pre-Filter, Collector Cell and the Mesh Post-Filter in this order.
6. Remove the Filter Carrier.

7.3.2 Cleaning the Main Chassis

Having removed the Mesh Filters (pre and post) and the Collector Cell:

1. Remove any accumulated grease from the sump; depending on its viscosity, either via the Drain Plug (see Figure 5 - Electrostatic Precipitator Unit - Main Chassis Components on page 10) or by scooping and scraping it out.
2. Spray the sump with a high quality degreaser and wipe over the sump's surfaces with a suitable cloth or paper towels.
3. Clean the electrical contact points on the inside of the Door Assembly, using a high quality degreaser and a suitable cloth or paper towels, ensuring that they are free of contaminants/grease.
4. Ensure that the rubber door seal is undamaged and free from contaminants/grease, cleaning with warm soapy water if necessary.
5. Clean the Filter Carrier and Backplate, using a high quality degreaser and a cloth, and replace in the Unit.

7.3.3 Cleaning the Mesh Filters (pre and post)

Clean the Mesh Filters as follows:

1. Clean the Mesh Filters (pre and post) in hot water (at approx. 60°C) to which a detergent solution has been added. This treatment can be repeated several times. A pressure washer can also be used to clean the filters.
2. Allow the Mesh Filters to dry completely after cleaning before re-inserting into the Unit.

7.3.4 Cleaning the Collector Cell

Clean the Collector Cell as follows:

1. Clean the Collector Cell in hot water (approx. 60°C) to which a detergent solution has been added.



WARNING

Although the Collector Cell can be cleaned using a pressure washer, extreme care must be exercised to avoid damaging or distorting the plates.

2. Check the Ioniser during washing for broken Ionisation Wires.

Note: If fitted, broken ionisation wires can simply be replaced by hooking the sprung end of the new wire over the support post, pulling the wire against the spring's tension and attaching the other end of the wire to the opposite post, having first removed the broken wire.

3. Whilst washing the Collector Cell, check to see if any of the Collector Cell's plates have been bent.

Note: If a bent plate is found, it can normally be straightened by either carefully applying pressure with a screwdriver or by using a pair of long nosed pliers.

If the Collector Cell is beyond repair, please contact Purified Air to purchase a new one.

4. Allow the Collector Cell to dry completely after cleaning before re-inserting into the Unit.

7.3.5 Replacing the Collector Cell and Pre and Post Mesh Filters

Replace the Collector Cell and pre and post Mesh Filters as follows:

1. Replace the Collector Cell.

Note: If the Unit has more than one Collector Cell, ensure that the electrical connections between them are making contact.

2. Slide the Mesh Filters (pre and post) into their previous positions in the Collector Cell and Filter Carrier.



INFORMATION

Ensure that the Collector Cell is correctly orientated with the extraction duct's airflow, as indicated by the arrow engraved on the Collector Cell.

Pay due attention to the position of the contact pin and contact spring on the Collector Cell which should connect with the contact discs on the door when it is closed.

3. Close the Main Door and refit the top and bottom Star Knobs.
4. Tighten the Star Knobs clockwise sufficiently to ensure a good seal between the Main Door and the Main Chassis of the Unit.

Note: It may be necessary to push the Main Door inwards, against the seal, onto the Main Chassis of the Unit whilst tightening the Star Knobs to enable them to be tightened sufficiently to ensure an adequate seal.

5. Switch the Unit On as normal. The green Run Light Indicator should illuminate.



INFORMATION

After the Unit is turned on, you may briefly hear a clicking or arcing as the plates in the Collector Cell build up a charge. This is perfectly normal.



WARNING

Should the clicking or arcing persist or the green Run Light Indicator go out, the Unit has a fault.

In this case, switch off the Unit and consult a qualified service technician.

7.4 Servicing

Purified Air or their designated distributor will be happy to carry out regular servicing of the Unit and offer Preventative Maintenance Contracts for all installations of their equipment.

Please contact their Head Office for full details:

service@purifiedair.com

Freephone: 0800 018 4000

8. Troubleshooting

If the Unit does not function correctly, consult the checklist below to see if you can correct the error yourself.



INFORMATION

A number of problems in the checklist below can also be caused by defects in other equipment connected to the Unit. This manual only deals with problems and solutions directly related to the Unit itself.

Problem	Possible Cause	Solution
Insufficient Extraction Capacity	Mesh Filters clogged or saturated.	Clean the filters.
	A breach/hole in the ducting.	Check and replace sealing material/repair hole.
Dust or smoke from the extraction outlet and/or green Run Light Indicator is not illuminated.	Collector Cell is saturated or mounted incorrectly causing short-circuiting.	Clean the Collector Cell and mount correctly.
	Poor/dirty electrical contacts in the Collector Cell.	Check and clean/repair.
	Short-circuit in the Collector Cell (caused by bent plates).	Check and repair.
Unit makes a cracking sound (= short circuit).	Collector Cell incorrectly mounted.	Mount correctly.
	Collector Cell heavily polluted.	Clean Collector Cell.
	Collector Cell not totally dry.	Allow thorough drying after cleaning.
	Bent Collector Cell plates.	Repair.
	Bent or broken ionisation wires (see 6. Fitting Stainless Steel Ioniser Blades on page 24).	Replace.
	Metal particles in Collector Cell.	Clean Collector Cell.
Unit switches off or will not start when clean collectors are installed during service.	The collector cell could appear dry but could have traces of water behind the insulators or secreted within the collector.	Run the extract system for one hour with the ESP switched off. This should allow any excess water to evaporate. After this period, try to restart the unit. If it still fails to start contact the supplier.



CAUTION

Should it not be possible to correct the error, consult a qualified service engineer.

9. Spare Parts List and Components Illustration

Item Number	Item Description	Part Number
	Collector	
1	Collector Cell Unit	ESP-1601-CC
2	Mesh Filter Element	ESP-1501-MF
	Collector Cell	
3	Ioniser Wire with springs (8 per pack) (Not Shown)	ESP-1602-IW
4	Push Button Brass HV contact	ESP-1603-BB
5	HV Spring contact	ESP-1604-SC
6	Insulator HV Black Thermoset Square	ESP-1605-IS
8	Stainless Steel Spiked Ioniser Blades (8 per pack) (Not Shown) (see 6 - Fitting Stainless Steel Ioniser Blades on page 24)	ESP-1607-SI
	Door	
9	Complete ESP Door & Electronics	ESP-1701-CD
10	High Voltage Power Supply (HVPS) including HV cable (2 parts) + wiring loom for post 2014 models.	ESP-1750-HV
11	Door Hinge (15mm) (main door & electrical door)	ESP-1702-DH
12	Door safety interlock switch	ESP-1703-DS
13	Rotary Mains Isolator Switch	ESP-1704-MS
14	HV Output Terminal Contact Disc on door (ceramic)	ESP-1705-OT
15	Clear PVC dome covers for HV output terminals.	ESP-1706-DC
16	HV Cable (2 pcs per set) (Not Shown)	ESP-1707-HC
17	LED Run Lamp (green 230V)	ESP-1708-LG
18	Door Star Knobs	ESP-1709-SK
19	Drain Plug	ESP-1710-DP
20	Rubber Door Seals (set of 6)	
21	Pictograms, Warning and Instruction Labels	
	Upgrades	
	HVPS (PWM200) replaces components in older models such as HF Driver, HV Transformer & HV short circuit protector.	These older parts are all now superseded
	HVPS Conversion kit for pre-2008 and pre-2014 Models.	ESP-HVPSCONV1
	HVPS Conversion kit for post-2014 Models. (ESP ____ EI)	ESP-HVPSCONV2
	BMS Kit fitted prior to leaving factory	ESP-1801-BMS
	BMS Kit fitted on site	ESP-1802-BMS

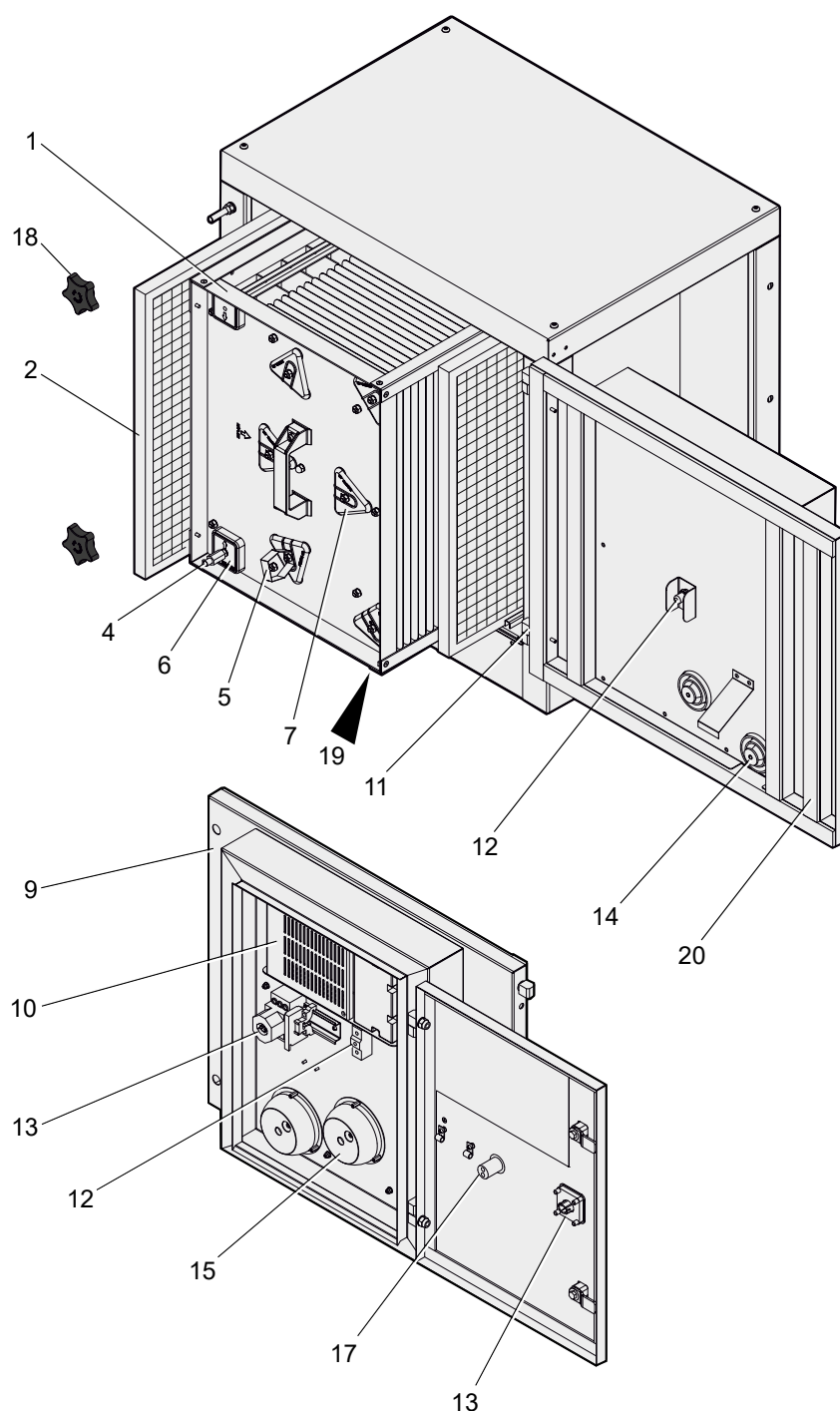


Figure 18 - Parts List Components Illustration

9.1 Spare Parts Ordering

All parts listed in the 9. Spare Parts List and Components Illustration on page 31 are available as spare parts.

Please quote the Part Number when ordering.

10. Wiring Diagram

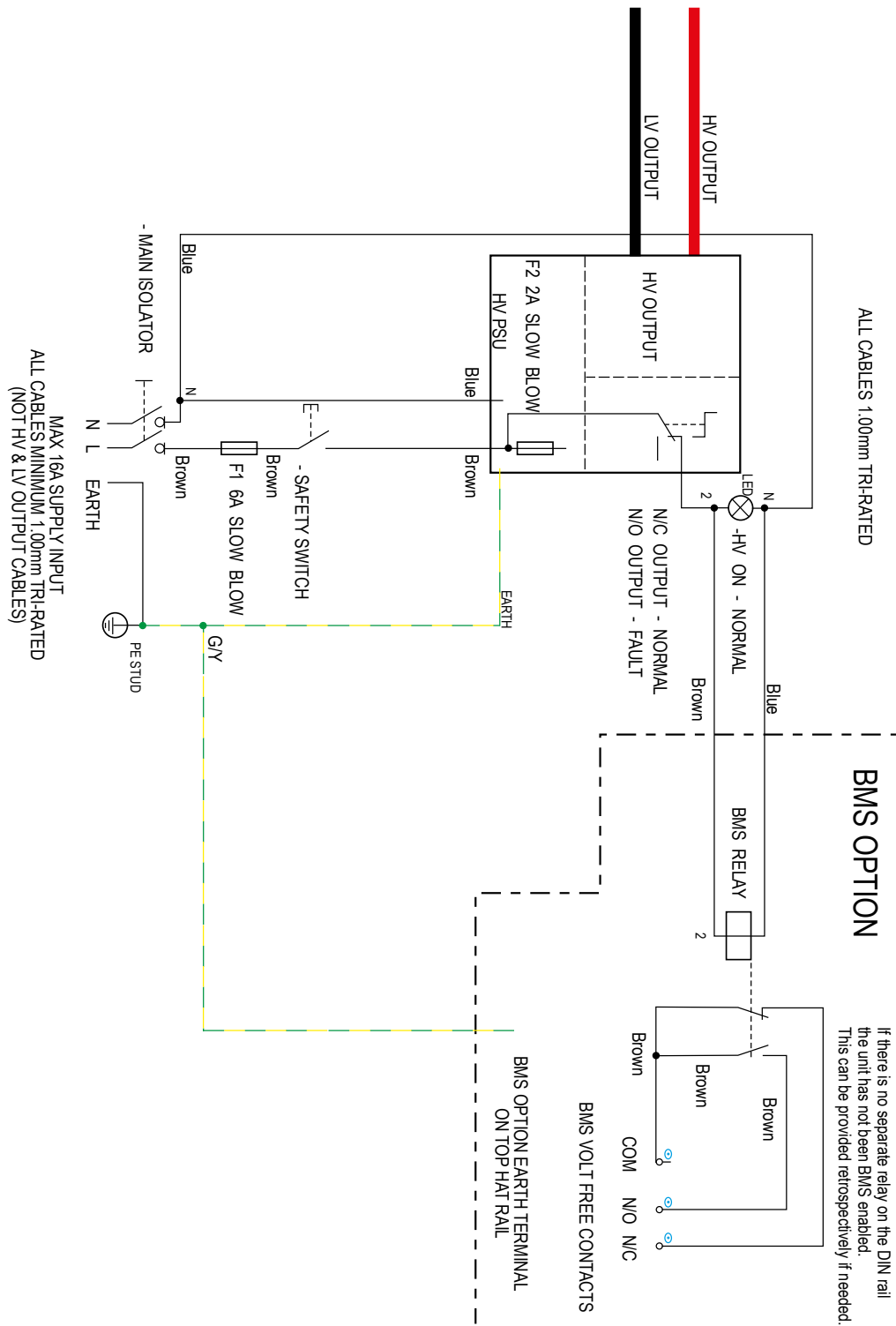


Figure 19 - Unit Wiring Diagram

11. Equipment Disposal



11.1 Packaging Material Disposal



INFORMATION

The Unit's Packaging materials are manufactured from recyclable materials in accordance with applicable local regulations.

The purpose of the packaging is to protect the Unit during transport. It consists of the following substances that can be reused:

- Cardboard (corrugated)
- Wood (untreated)

Do not dispose of the packaging material as general industrial waste.

11.2 Used Unit Disposal

Units which you would like to dispose of may still contain valuable substances and materials. Do not dispose of the Unit as general industrial waste.

12. Contact Details

At Purified Air, we pride ourselves on our excellent levels of customer service and maintenance.

12.1 Nationwide Coverage in the UK

We can offer nationwide coverage with teams of directly employed service engineers working out of our UK hubs.

For all UK Service and Maintenance enquiries, please contact via:

service@purifiedair.com

0800 018 4000

12.2 Service and Maintenance Contracts

With every installation, we offer the opportunity to sign up to one of our service and maintenance contracts. These are structured to suit individual needs, on a post pay basis with the customer only being invoiced after each service, saving them both time and money against ad hoc servicing requests.

12.3 Dependability

Whether you have our commercial kitchen exhaust filtration equipment in your restaurant, cafe or take away, you can rest assured that we will always be there when you need us.

12.4 Global Sales

For all installations of our equipment outside of the UK, please refer back to your designated distributor.

13. Warranty Statement

Your new Electrostatic Precipitator is guaranteed against the cost of breakdown repairs for one year from the date of the original purchase.

The manufacturer does not accept any liability for damage to the Unit or personal injury caused by non-observance of the safety instructions in this manual or negligence during the installation, use, maintenance and repair of the models mentioned on the cover of this manual and any associated accessories.

What is covered?

- Repairs necessary as a result of faulty materials, defective components or manufacturing defect.
- The cost of functional replacement parts, but excluding consumable items.
- The labour costs of a Purified Air approved repairer to carry out the repair.

What is not covered?

- Transit, delivery or accidental damage or misuse and abuse.
- Any installation which fails to meet the installation, location and operating requirements and parameters outlined in this manual.
- Manufacturing defects only affecting the Unit's cosmetic appearance.
- Consumable items including but not limited to pre and post Mesh Filters, Collector Cell and Ionisation Wires (see 6. Fitting Stainless Steel Ioniser Blades on page 24).
- Repairs required as a result of unauthorised repair or installation by anyone other than a Purified Air approved installer.
- Any damage caused to the Unit by its use by anyone other than authorised, trained and qualified users or personnel under the supervision and responsibility of authorised, trained and qualified users.
- Any damage caused to the Unit by incorrect servicing procedures.
- Use of the Unit in any application which is not specifically mentioned in this manual or approved, in writing, by the manufacturer.
- The guarantee is applicable only to new products and is not transferable if the product is resold.

Purified Air disclaims any liability for incidental or consequential damages.

The guarantee does not in anyway diminish your statutory or legal rights.

Please keep your purchase receipt or other proof of purchase in a safe place. You will need to have it should the product require attention under guarantee.

14. Certification

14.1 EC Declaration of Conformity

Purified Air Limited Lyon House Lyon Road Romford Essex RM12BG Tel: +44 1708 755414 Fax: +44 1708 721488 Email: enq@purifiedair.co.uk www.purifiedair.co.uk	 
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EC Declaration of Conformity

Document Number: Doc ESP 1201

We, Purified Air Limited at above address, declare the products detailed below comply with the requirements of the following EU Directives,

- Low Voltage Directive 2005/95/EC
- Electromagnetic Compatibility Directive 2004/108/EC

Equipment description	<i>Electrostatic Precipitator</i>			
Make/Brand	<i>Purified Air</i>			
Model reference	ESP 1500EI	ESP 3000EI	ESP 4500EI	ESP 6000EI

Compliance of the equipment has been assessed with respect to the essential requirements and with reference to the following harmonised standards:

- EN 60204-1:2006 +A1:2009
- EN55014-1 :2006+A 1:2009
- EN 55014-2: 1997+ A2:2008
- EN 61000-3-2:2006 +A2: 2009
- EN 61000-3-3:2008

A technical file for this equipment is retained at the above address



Gareth Smith
 Technical Director
 Purified Air Limited
 January 2016

Figure 20 - EC Declaration of Conformity



FreePhone (UK Only) 0800 018 4000
International +44 1708 755414

Purified Air Limited. Lyon House, Lyon Road, Romford, Essex. RM1 2BG

www.purifiedair.com | enq@purifiedair.com

Annex D – Details on Odour Control

UV-O Odour Control Units



Technical and Operations Manual

Models Covered: UV-O 500
UV-O 1000

Using this Manual

This manual is intended to be used as a work of reference by professional, well trained and authorised users to assist them in safely installing, using, maintaining and repairing the Units mentioned on the cover of this document.

Please note that it is strongly recommended that training is given by Purified Air Limited prior to operatives attempting to carry out maintenance or repair work on these Units.

Copyright Statement

All rights reserved

No part of this publication may be copied or published by means of printing, photocopying, microfilm or otherwise without prior written consent of the manufacturer. This restriction also applies to the corresponding drawings and diagrams.

The information given in this manual has been collected for the general convenience of our clients. It has been based on general data pertaining to construction material properties and working methods known to us at the time of issue of the document and is therefore subject, at any time, to change or amendment and the right to change or amend is hereby expressly reserved. The instructions in this publication only serve as a guideline for installation, use, maintenance and repair of the models mentioned on the cover page of this document.

This manual is to be used for the standard models of the Units of the type given on the cover page. Thus the manufacturer cannot be held responsible for any damage resulting from the application of this manual to the version actually delivered to you.

This manual has been written with great care. However, the manufacturer cannot be held responsible either for any errors occurring in this manual or their consequences.

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1. Safety

1.1 Introduction

Everyone working on or with these Units must be familiar with the contents of this manual and must strictly observe the instructions herein.

The Management should instruct personnel in accordance with this manual and observe all instructions and directions given herein.

Note: Always follow the steps for any instructions in this manual in the order given.

Always keep this manual with your Unit.

The users of the Units are always fully responsible for observing all applicable local safety instructions and regulations.

Specific working conditions or selected accessories may require additional safety instructions. Contact your supplier immediately if you detect a potential danger when using these Units.

1.2 Safety Warnings and Instructions

The following symbols and notifications are used in this manual:



WARNING!

Used to indicate where there is a risk of injury or death.



WARNING! - DANGER OF ELECTRIC SHOCK!

Used to indicate where there is a risk of injury or death from electric shock.



WARNING



Used to indicate that Ozone (O₃) is produced by this Unit



WARNING

Used to indicate that the Unit contains lamps that produce UV light.



CAUTION

Used to indicate where there is a risk of damage to equipment.



INFORMATION

Important information or useful hints about usage.



RECYCLING

Recycling information.



WEEE REGULATIONS

Used to ensure that waste electrical equipment is disposed of correctly.

1.3 Pictograms, Warnings and Instructions Displayed on the Unit

The pictograms, warning and instructions attached to the Unit are, themselves, safety features.

They must not be covered or removed and must remain present and legible through the entire life of the Unit.

- Immediately replace or repair damaged or illegible pictograms, warnings and instructions.

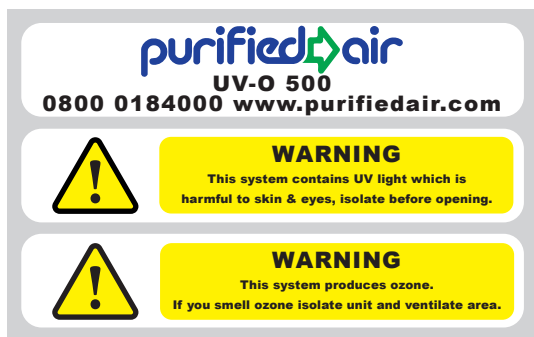


Figure 1 - UV-O 500 Unit Label

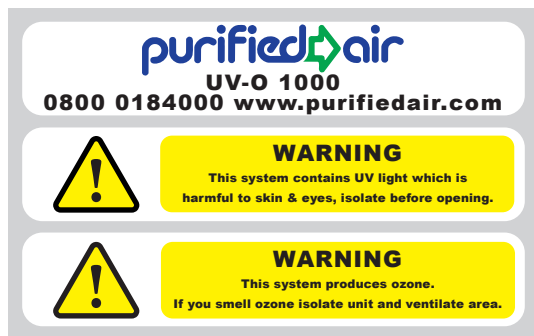


Figure 2 - UV-O 1000 Unit Label

1.4 Safety Features

To prevent inadvertent exposure to UV light, the UV-C lamps are secured behind locked panels, with the Units automatically shutting down when these panels are unlocked.



CAUTION

- All safety features must be correctly fitted and can only be removed for maintenance and repair jobs by skilled and authorised service engineers.
- These Units must not be used if the safety features are not fully present or defective.
- The safety features should be regularly checked for their proper functioning and, if defective, should be immediately repaired.

1.5 Safety Warnings and Cautions



WARNING! RISK OF EXPLOSION!

These Units are not explosion-proof rated. They can cause sparks and should therefore not be used in areas with an explosion risk.



WARNING!

Ozone (O₃) is produced by these Units. Ozone can be poisonous at certain levels of concentration.



Inhalation of ozone causes dryness of the mouth, coughing, and irritates the nose, throat, and chest.

It may cause difficulty in breathing, headaches and fatigue, and could aggravate existing bronchial conditions including asthma. The characteristic sharp, irritating odour is readily detectable at low concentrations (0.01 to 0.05 ppm).

UNIT MUST NOT BE OPERATED WITHOUT KITCHEN EXTRACT FAN RUNNING.



WARNING! - DANGER OF ELECTRIC SHOCK!

- To avoid electric shock:
- Do not operate these Units without a proper electrical ground/earth.
- Always disconnect power to these Units and isolate them from the power supply before performing any service or maintenance.
- Do not operate these Units if their power cables are damaged, or if any other damage to them is visible or suspected.
- The supplied utility/mains power must match the power requirements listed on the Units' rating labels.



WARNING!

- These Units contain lamps that produce UV light.
- Avoid exposure to direct or reflected ultraviolet rays.
- Immediate or prolonged exposure to UV light can result in painful eye injury, skin burn, premature skin aging, or skin cancer.



CAUTION

- Regularly inspect your Unit and check it for damage.
- Verify the correct functioning of all of the safety features.
- Read and save all notices, warnings and safety instructions received with your Unit.
- Do not alter the construction or design of these Units.
- Do not remove safety labels or devices.
- Do not use these Units for other than their intended purpose; as described in this manual.
- Only use original spare parts.
- Keep the operating controls free from dirt and grease.



CAUTION

- Make sure the room is always sufficiently ventilated, particularly in smaller confined areas.
- Do not use these Units at a relative humidity exceeding 75%.
- Do not use these Units at temperatures below 5°C or above 56°C.
- Check the working environment. Do not allow unauthorised persons to enter the working environment.
- Use common sense. Stay alert and pay attention to your work. Do not use these Units when you are tired or under the influence of drugs, alcohol or medicine.

1.6 Modifications

Modification of these Units is not permitted.

1.7 Users

Installation or maintenance of these Units is exclusively reserved for authorised, trained and qualified users.

Temporary personnel and trainees should only access these Units under the supervision and responsibility of authorised, trained and qualified users.

1.8 Technical Specifications

	UVO500	UVO1000
Electrical Supply:	220/240V 50Hz	220/240V 50Hz
Max Power Consumption:	140 Watts	700 Watts
Max Air Volume:	1m3/sec	2m3/sec
Weight:	10.5 Kg	50 Kg
Dimensions:	W 610mm	W 1521mm
	H 300mm	H 350mm
	D 200mm	D 404mm

1.8.1 Rating Plates



Figure 3 - UV-O 500 Unit Rating Plate



Figure 4 - UV-O 1000 Unit Rating Plate

2. Product Overview



Figure 5 - UV-O 500 Unit



Figure 6 - UV-O 1000 Unit Installed

2.1 Intended Use

UV-O Odour Control Units are designed to efficiently remove odorous compounds from the fumes extracted from commercial kitchens.

Simple to install, the Units are designed to be located on the outside of the ducting. The fact that they are externally located makes these Units ideal for retrospective installations and, as the UV lamps are outside of the airstream, maintenance requirements are minimal.

To maximise the Units' efficiency, they should be installed into the extraction ducting of a commercial kitchen, down stream of the extraction hood on the negative side of the fan.



CAUTION

Using these Units for other purposes is considered contrary to their intended use. The manufacturer accepts no liability for any damage or injury resulting from such use.

These Units have been built in accordance with state-of-the-art standards and recognised safety regulations.



CAUTION

Only use these Units

- **If they are not damaged in any way.**
- **After following the instructions laid down in this manual.**

2.2 Features

When installed correctly, Purified Air's UV-O Odour Control Units have the following features and benefits:

- Use highly efficient UV-C technology.
- Robust, compact construction.
- Twelve month effective lamp life.
- Minimum maintenance requirements.
- Enhanced safety - UV-C lamps are locked behind panels.
- Optional self-diagnostic system.
- Designed to complement our Electrostatic Precipitator (ESP) system.
- Reduce the need for duct cleaning.
- Can reduce cooking odours by up to 90%*.
- Grease is broken down in to more easily managed compounds.
- Virtually no pressure increase within the duct.

* In particularly odourous environments, high levels of odour control will only be achieved by also using good quality particulate control systems (particularly ESPs) and supplementary odour control systems in conjunction with this Unit.

2.3 Operating Principles

Purified Air's UV-O Odour Control Units contain either two (UV-O 500) or ten (UV-O 1000) high output UV-C (short-wavelength ultraviolet radiation) lamps and are designed to be located outside the extraction duct.

2.3.1 Ozone and Free Radical Production

The UV light produced by the UV-C lamps converts oxygen present in the air into ozone.

Ozone is a highly reactive oxidant which interacts with most contaminants, allergens and odour producing compounds it comes into contact with, oxidising them and rendering them harmless.

The UV light produced by the lamps can also further convert the ozone to hydroxyl free radicals in the presence of water or water vapour.

Free radicals are highly reactive oxidants which makes them effective natural air cleansing agents.

The mixture of ozone and hydroxyl free radicals produced in this way creates a much more powerful oxidising action (Ozonolysis) than the use of ozone alone.

2.3.2 Location

It is widely accepted that the best way to apply UV-C is in the airstream itself. However, in such a situation, the lamps can quickly become dirty, greatly reducing their effectiveness.

Unlike other UV-C systems, the UV-O Odour Control Units are designed to be located outside of the kitchen extract duct, connected via a spigot.

Negative pressure forms as the extract fume is drawn down the duct across the spigots opening, thus drawing ambient air into the Unit and across the UV lamps producing Ozone which is then introduced into the duct.

As the ambient air is relatively contaminant free the lamps stay cleaner allowing a more constant production of Ozone.

2.4 Components

2.4.1 UV-O 500 Components

The UV-O 500 Unit consists of a Main Chassis which contains the UV lighting source behind a lockable, hinged, access panel.

A green Power Light and blue Safety Light are located on the lower Panel of the Unit.

An Airflow Sensor (See Figure 8 - Air Flow Sensor on page 10) is mounted on the right hand side of the Main Chassis below the Duct Connection Spigot.

The Air Inlet is located on the left hand side of the Unit (See Figure 9 - Air Inlet on page 10).

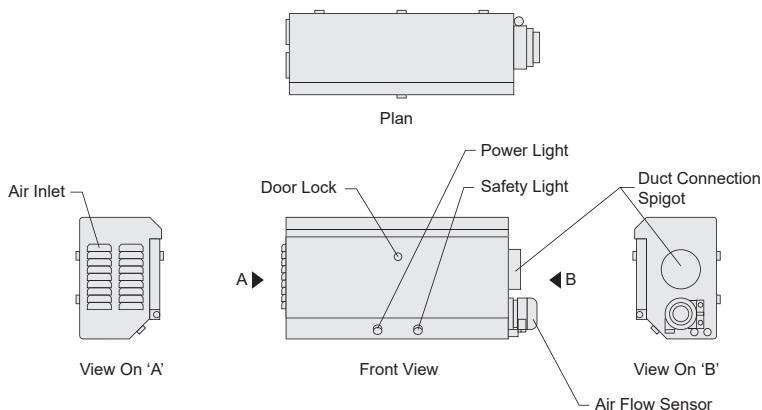


Figure 7 - UV-O 500 - Views



Figure 8 - Air Flow Sensor



Figure 9 - Air Inlet

2.4.2 UV-O 1000 Components

The UV-O 1000 Unit consists of a Main Chassis which contains the UV lighting source behind a lockable hinged access panel also secured with four star knobs. A Control Panel, on the right hand side of the Main Chassis, contains the Rotary Mains Isolation Switch green Power Light and blue Safety Light.

An Airflow Sensor (See Figure 11 - UV-O 1000 Air Flow Sensor and Air Outlet on page

11) is mounted on the right hand side of the Main Chassis below the Airflow Outlet/Duct Connection Spigot.

The Air Inlet, containing the Unit's filter, is located on the left hand side of the Unit (See Figure 12 - Air Inlet on page 12).

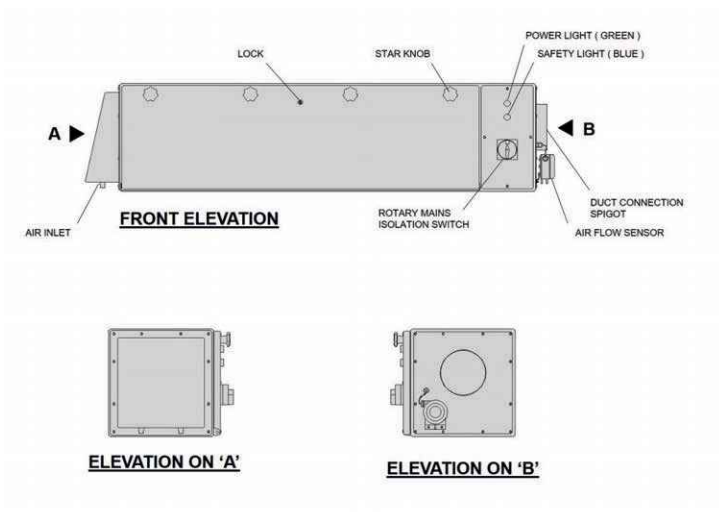


Figure 10 - UV-O 1000 - Front and Side Views



Figure 11 - UV-O 1000 Air Flow Sensor and Air Outlet



Figure 12 - Air Inlet

3. Storage, Unpacking and Handling

3.1 Storage

Prior to installation, a UV-O Unit must be stored in its original packaging in a dry environment.

3.2 Shipping List

Each Unit is shipped with the following:

- Main Unit.
- Airflow Sensor Probe Assembly.
- This Technical and Operations Manual.

It is strongly recommended that Purified Air commission the UV-O Unit. However, should the customer decide to complete these tasks (See 4.3.3 Commissioning the UV-O 500 Unit on page 20 and 4.4.3 Commissioning the UV-O 1000 Unit on page 27) and following the signing of a waiver indemnifying Purified Air against any negative consequences, the following additional items will also be provided:

- Keys to the Main Unit's Front Panel.
- Two or Ten UV-C Lamps depending on the model.

3.3 Unpacking and Handling

Strip away all packaging, wrapping and strapping (this must only be done by trained, professional installers).



WARNING!

- These Units are heavy and the appropriate lifting and handling practices must be observed, for both unpacking and installation, to avoid personal injury or damage to the equipment.
- Consult the Technical Specifications (See Paragraphs 1.8 Technical Specifications on page 6 and for the Units' weights).



CAUTION

Inspect the Unit and check it for damage. Ensure all safety features are present and functioning correctly.

4. Installation Guidance

4.1 Overview

Installation of the Units should only be carried out by trained, professional installers.

Installations vary widely depending on the specific site requirements, therefore, this section only provides general guidance for the installers.

Note: It is strongly recommended that UV-O Units are commissioned by Purified Air Ltd to ensure that they are installed correctly and safely.

If in any doubt regarding the installation of the UV-O Units, contact Purified Air Ltd.

4.2 Unit Dimensions

The dimensions of the UV-O Units are detailed below.

4.2.1 UV-O 500 Unit Dimensions

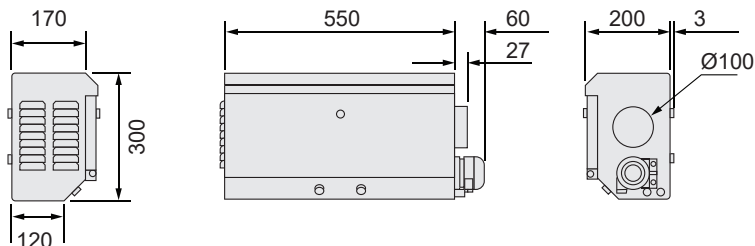


Figure 13 - UV-O 500 - Dimensions
(All Dimensions in Millimetres)

4.2.2 UV-1000 Unit Dimensions

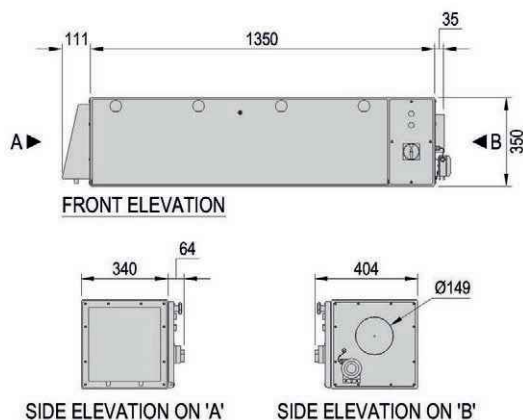


Figure 14 - UV-O 1000 - Dimensions
(All Dimensions in Millimetres)

4.3 Installing the UV-O 500 Unit

4.3.1 Installing the UV-O 500 Main Chassis

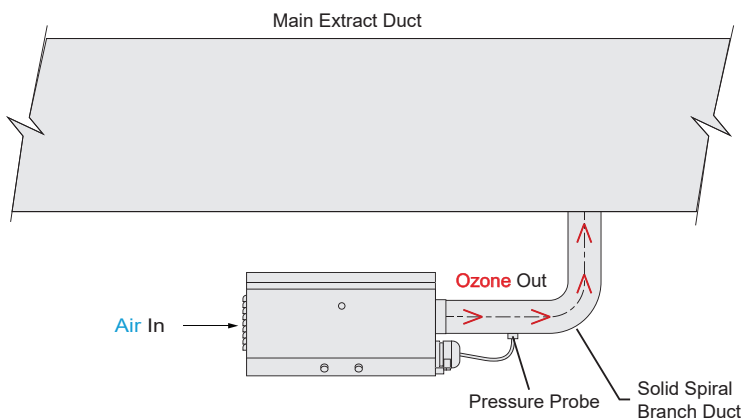


Figure 15 - UV-O 500 Installation Schematic

Before installation, the following points should be considered:

- The UV-O 500 Unit should be located in close proximity to the kitchen extract ducting.

- The Unit should be positioned with good access to allow for future servicing and maintenance.
- It is recommended that the Unit be mounted onto a wall using the pre-drilled holes in the rear of the casing.



WARNING!

If an alternative method of mounting the Unit is employed it is important that these holes are totally blocked/closed to prevent the escape of UV light.

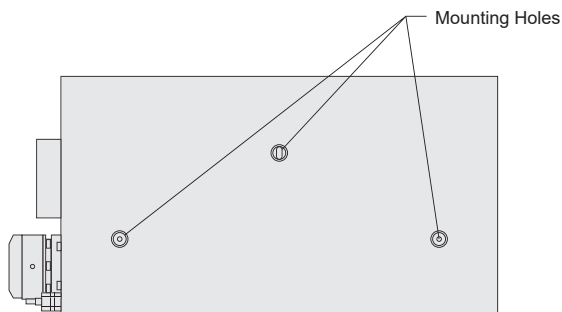


Figure 16 - UV-O 500 Mounting Holes

Rigid 100mm diameter galvanised metal ducting should be used to connect the UV-O 500 Unit to the kitchen extraction ducting (See Figure 15 - UV-O 500 Installation Schematic on page 15).

The 100mm galvanised metal ducting should connect securely to the spigot on the side of the Unit and be connected to the kitchen extraction ducting via a spigot.



WARNING!

The Unit must be installed on the suction (negative pressure) side of the extraction fan.



WARNING

- The UV-O 500 will produce ozone which is a poisonous gas with a distinctive smell.
- The kitchen extract system into which the UV-O 500 system is installed must be sound with no holes that will allow ozone to escape.
- If ozone is smelt within the premises, the UV-O 500 must be switched off immediately.
- Care must be taken that the kitchen extract point is not close to air inlets, windows etc. where elevated ozone levels will cause a problem.





CAUTION

- Never install the Unit in front of entrances and exits which could be used by the emergency services.
- Check that any intended supporting structure is adequate for the weight of the Unit. See Technical Specifications for the Unit weight.

4.3.2 Installing the UV-O 500 Air Flow Sensor Pressure Probe

The UV-O 500 must only be allowed to operate when the kitchen's extraction system is running.

To this end, an Air Flow Sensor and Pressure Probe, measuring air pressure in the extraction ducting, are fitted to the UV-O 500 and only allow the Unit to operate when a sufficient volume of air is flowing through the extraction ducting.

The Air Flow Sensor will switch on power to the Unit if the air pressure in the duct is between 20 and 300Pa, (less than the pressure outside the duct or "at the sensor").



Figure 17 - Air Flow Sensor

Install the Air Flow Sensor's Pressure Probe into the Branch Duct which connects the UV-O 500 to the Main Extract Duct (See Figure 15 - UV-O 500 Installation Schematic on page 15) as follows:

1. Drill one 7mm and two 2mm holes into the Branch Duct corresponding to the holes in the Airflow Sensor's Pressure Probe mounting flange.
2. Insert the Airflow Sensor's Pressure Probe into the 7mm hole drilled in the Branch Duct and secure with screws through the flange into the two 2mm holes drilled in the Branch Duct
(See Figure 18 - Installing the Air Flow Sensor's Pressure Probe on page 18).

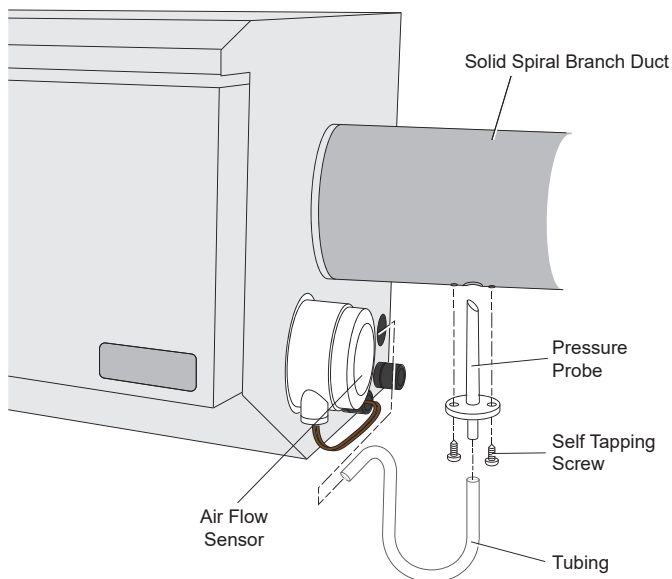


Figure 18 - Installing the Air Flow Sensor's Pressure Probe

3. Connect the Pressure Probe via the PVC tube to Port P1 on the Air Flow Sensor, leaving Port P2 unused and open to the atmosphere (see Figure 19 below):

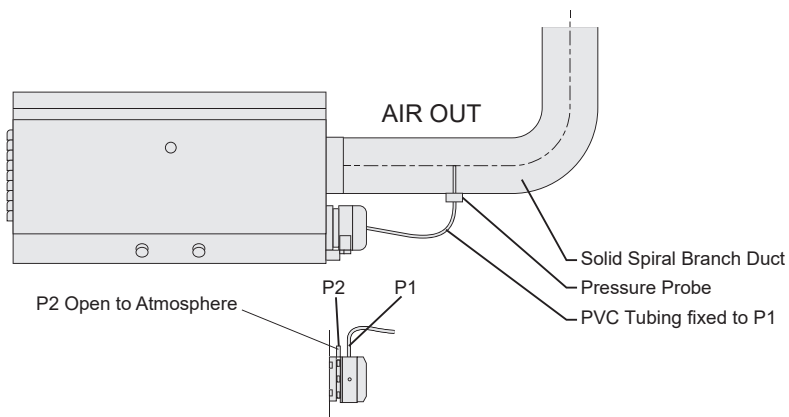


Figure 19 - Connecting the Air Flow Sensor's Pressure Probe

4. Link the extraction fan and UV-O 500 power supplies.

5. Turn on the extraction fan and confirm that air is passing through the Unit's air inlet and passing into the extraction ducting.



WARNING



Under no circumstances should the Unit be used if the direction of the airflow is reversed and air is exiting from the Unit's air inlet.



CAUTION

The Unit's air inlet must be kept clear to allow airflow through the system.

4.3.3 Commissioning the UV-O 500 Unit by Others

As the Unit is owned by your company, you may wish to commission it yourselves. If this is the case, one of your Directors must sign the UVC Disclaimer acknowledging that you fully understand the dangers associated with the installation procedure. On receipt of the signed UVC Disclaimer, Purified Air will supply the correct number and type of lamps required for the UV-O unit ordered along with a set of keys.

Final commissioning of the Unit to be carried out as follows:

1. Unlock and open the Front Panel which hinges down once the lock has been undone.

Note: The lamp holder can be released from its fixings to simplify installation of the lamps. (See Figure 23. Electrical Connections on page 22)

2. Insert the UV lamps into their clips.
3. Slide the lamps to the Left to engage them with their plugs (See Figure 36 - UV-O 500 UV Lamp Plugs on page 35).



Figure 20 - UV-O 500 UV Lamp



Figure 21 - UV-O 500 UV Lamp Location

4. Wire the UV-O 500 Unit into the mains via an isolating switch (not supplied) mounted not more than 1 meter from the Unit, in an easily accessible location:

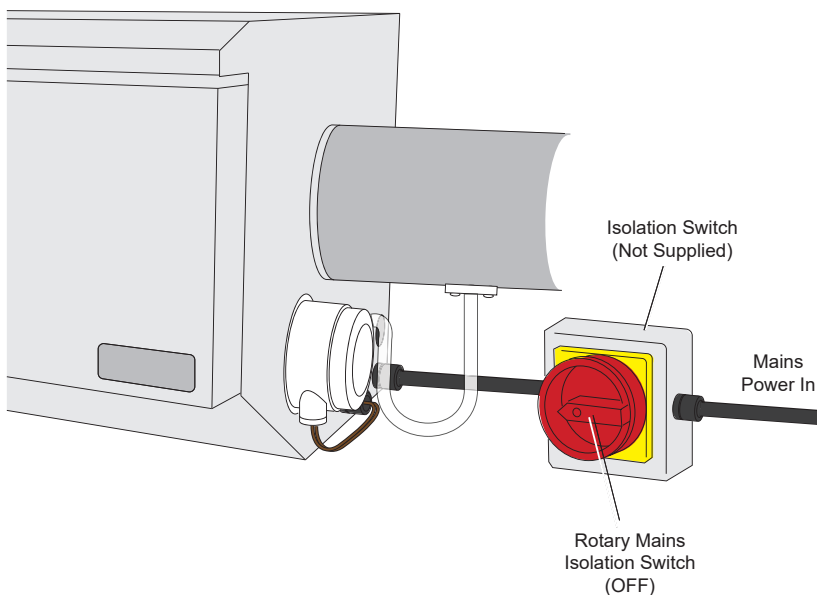


Figure 22 - Installation of Rotary Mains Isolation Switch

- The Unit's mains connection terminals are located on the end of the lamp holder section (See Figure 23 - Electrical Connections on page 22)
- The mains cable should be run through the cable gland located in the bottom right hand corner of the Unit, behind the Air Flow Sensor (See Figure 17 - Air Flow Sensor on page 17).



Figure 23 - Electrical Connections

Note: To check that all UV lamps are working it is necessary to bypass the micro-switches on the inside top front of the UV-O 500 to enable the Front Panel to be open when the Unit is in operation. This procedure should only be undertaken by a qualified Purified Air engineer.



CAUTION

Appropriate PPE equipment should be worn during this check.

5. Once the lamps have been fitted and the electrical connection completed, the Front Panel can be closed and locked.

4.4 Installing the UV-O 1000 Unit

4.4.1 Installing the UV-O 1000 Main Chassis

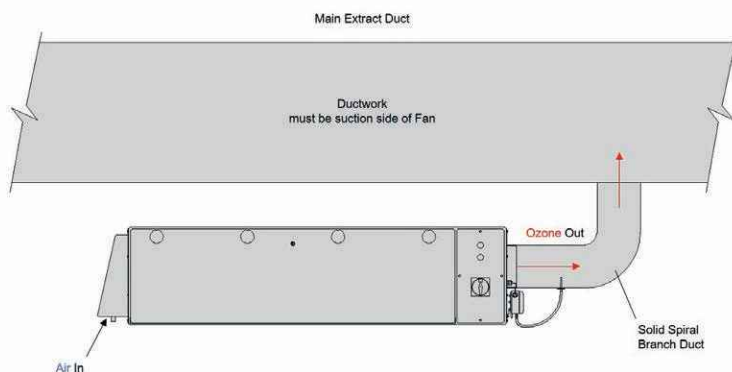


Figure 24 - UV-O 1000 Installation Schematic

Before installation, the following points should be considered:

- The UV-O 1000 Unit should be located in close proximity to the kitchen extract ducting.
- The Unit should be positioned with good access to allow for future servicing and maintenance.
- If the Unit is to be mounted onto a wall, the casing can be drilled to allow this.



WARNING!

If you drill the case to mount the Unit onto a wall, it is important to make sure that the fixings used will not allow any UV light to escape.

- Alternatively, mounting brackets are supplied that can be fixed to the spigot and inlet plates via the bolts already in place, as shown below:

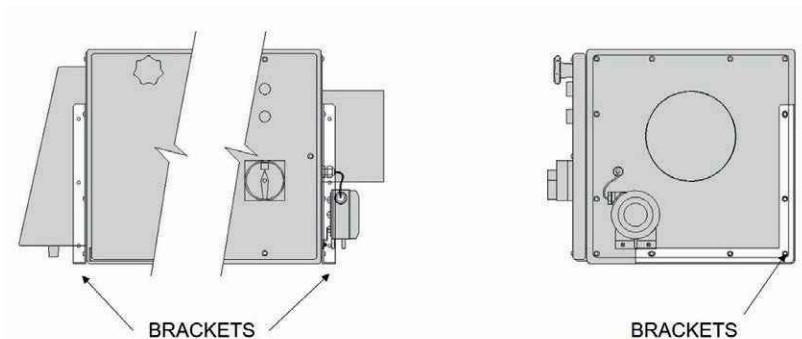


Figure 25 - UV-O 1000 Mounting Bracket Installation

Rigid 100mm diameter galvanised metal Branch Duct should be used to connect the UV-O 1000 Unit to the kitchen extraction ducting (See Figure 24 - UV-O 1000 Main Chassis Installation Schematic on page 23).

The 100mm galvanised Branch Duct should connect securely to the spigot on the side of the Unit and should be connected to the kitchen extraction ducting via a spigot.



WARNING!

The Unit must be installed on the suction (negative pressure) side of the extraction fan.



WARNING



- The UV-O 1000 will produce ozone which is a poisonous gas with a distinctive smell.
- The kitchen extract system into which the UV-O 1000 system is installed must be sound with no holes that will allow ozone to escape.
- If ozone is smelt within the premises the UV-O 1000 must be switched off immediately.
- Care must be taken that the kitchen extract point is not close to air inlets, windows etc., where elevated ozone levels will cause a problem.



CAUTION

- Never install the Unit in front of entrances and exits which could be used by the emergency services.
- Check that any intended supporting structure is adequate for the weight of the Unit. See Technical Specifications for the Unit weight.

4.4.2 Installing the UV-O 1000 Pressure Probe

The UV-O 1000 must only be allowed to operate when the kitchen's fume extraction system is running.

To this end, an Air Flow Sensor and Pressure Probe, measuring air pressure in the extraction ducting, are fitted to the UV-O 1000 and only allow the Unit to operate when a sufficient volume of air is flowing through the extraction ducting:

The Air Flow Sensor will switch on power to the Unit if the air pressure in the duct is between 20 and 300Pa, (less than the pressure outside the duct or "at the sensor").



Figure 26 - Air Flow Sensor

Install the Air Flow Sensor's Pressure Probe into the Branch Duct which connects the UV-O 1000 to the Main Extract Duct (See Figure 27 - Installing the Air Flow Sensor's Pressure Probe on page 26) as follows:

1. Drill one 7mm and two 2mm holes into the Branch Duct, corresponding to the holes in the Airflow Sensor's Pressure Probe mounting flange.
2. Insert the Airflow Sensor's Pressure Probe into the 7mm hole drilled in the Branch Duct and secure with screws through the flange into the two 2mm holes drilled in the Branch Duct (See Figure 27 - Installing the Air Flow Sensor's Pressure Probe on page 26).

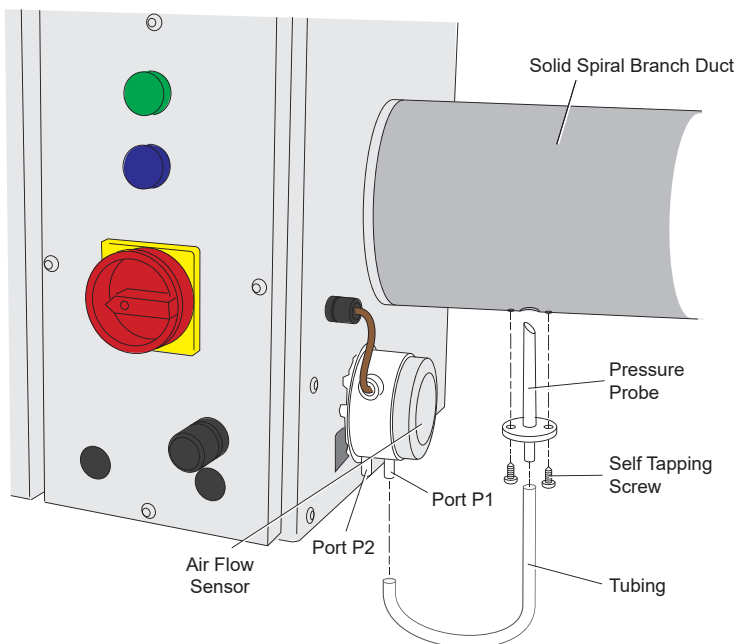


Figure 27 - Installing the Air Flow Sensor's Pressure Probe

3. Connect the Pressure Probe via the PVC tube to Port P1 on the Air Flow Sensor, leaving Port P2 unused and open to the atmosphere (see Figure 27 above).
4. Link the extraction fan and UV-O 1000 power supplies.
5. Turn on the extraction fan and confirm that air is passing through the Unit's air inlet and passing into the extraction ducting.



WARNING
OZONE
IN USE!

WARNING

Under no circumstances should the Unit be used if the direction of the airflow is reversed and air is exiting from the Unit's air inlet.



CAUTION

The Unit's air inlet must be kept clear to allow airflow through the system.

4.4.3 Commissioning the UV-O 1000 Unit by Others

As the Unit is owned by your company, you may wish to commission it yourselves. If this is the case, one of your Directors must sign the UVC Disclaimer acknowledging that you fully understand the dangers associated with the installation procedure. On receipt of the signed UVC Disclaimer, Purified Air will supply the correct number and type of lamps required for the UV-O unit ordered along with a set of keys.

Final commissioning of the Unit to be carried out as follows:

1. Undo the Front Panel's lock and four Star Knobs.
2. Lower down the Front Panel.
3. Slide the Lamp Holder out of the Unit on its Runner System:

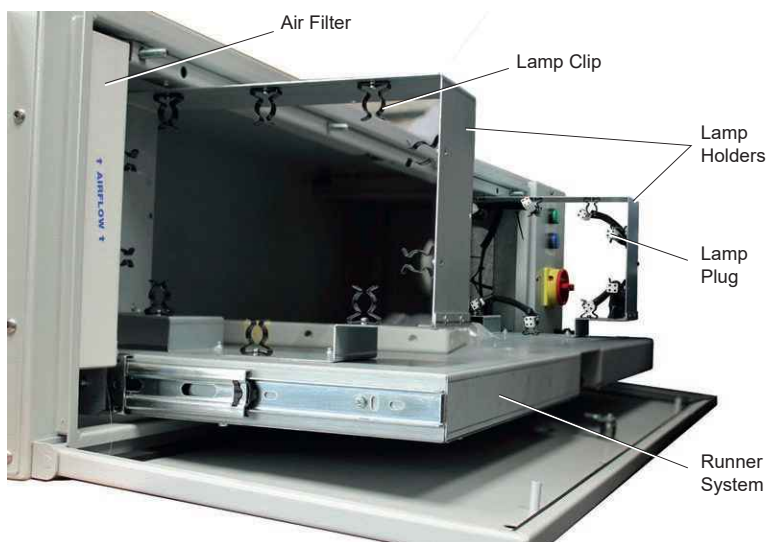


Figure 28 - Lamp Holder and Runner System

4. Clip the lamps into position (see Figure 28 above).
5. Connect the plugs to the ends of the UV lamps (see Figure 28 above).



Figure 29 - Lamp Clips



Figure 30 - Lamp Plugs



Figure 31 - UV-O 1000 UV Lamp

6. The UV-O 1000 should now be wired into the mains via the Rotary Mains Isolation Switch on the front of the Unit as follows

- The Unit's mains connection terminals are located behind a control panel on the right hand side of the main chassis. This is held in place by 4No. screws. There is an internal cover, with 1No. screw, which needs to be taken off to access the connection terminal. (See Figure 28 - Lamp Holder and Runner System on page 27).
- The mains cable should be run through the cable gland located in the bottom right hand corner of the front of the Unit (See Figure 33 - UV-O 1000 Control Panel on page 30)

Note: To check that all UV lamps are working it is necessary to bypass the micro-switches on the inside top front of the UV-O 1000 to enable the Front Panel to be open when the Unit is in operation. This procedure should only be undertaken by a qualified Purified Air engineer.



CAUTION

Appropriate PPE equipment should be worn during this check.



WARNING!

- These Units contain lamps that produce UV light.
- Avoid exposure to direct or reflected ultraviolet rays.
- Immediate or prolonged exposure to UV light can result in painful eye injury, skin burn, premature skin aging, or skin cancer.

7. Once the lamps have been fitted and the electrical connection completed, push the assembled Runner System back into position, replace electrical control panel covers, close up the Front Panel, secure the four Star Knobs and fasten the lock.

4.4.4 Building Management System

The ability to connect a Building Management System (BMS) to the UVO range of units is an optional extra. If required this can be ordered with the unit and fitted by Purified Air before dispatch at an additional cost, alternatively it can be retro fitted once installed on site, again by an experienced Purified Air engineer, but this does incur a higher additional cost.

5. Operation and Control

5.1 UV-O 500 Control Panel

The lower, angled section of the front of the Unit's main case contains a green Power Light and blue Safety Switch Light.



Figure 32 - UV-O 500 Control Panel

5.2 UV-O 1000 Control Panel

A Control Panel is situated on the right hand side of the Main Chassis which contains the Rotary Mains Isolation Switch, Green Power Light and Blue Safety Switch Light.

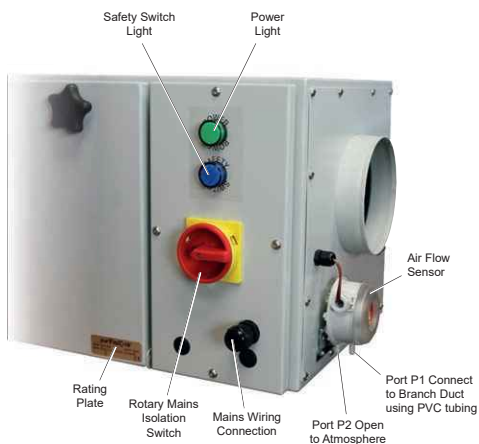


Figure 33 - UV-O 1000 Control Panel

5.3 Before Use

5.3.1 UV-O 500 and UV-O 1000

Before use, ensure that all safety precautions have been taken and that environmental conditions are suitable for operation of the Unit (See 1.5 Safety Warnings and Cautions on page 4).

5.4 Switching the UV-O 500 Unit On

1. Ensure that the kitchen extractor fan is running.
2. Turn on the Rotary Mains Isolation Switch (On/Off) to the 'On' position.

Note: The green Power Light will illuminate, indicating that power is being supplied to the Unit.

The blue Safety Switch Light will illuminate (See Figure 32 - UV-O 500 Control Panel on page 30), indicating that the various safety switches are engaged and that sufficient airflow is passing through the Unit.



WARNING

Please contact your service agent if either the green Power Light or blue Safety Switch Light don't illuminate when the Rotary Mains Isolation Switch is in the 'On' position.



WARNING

- If ozone can be smelt in the area where the UV-O 500 Unit is installed, the Unit has been incorrectly installed
- It should be isolated via the Mains Isolator Switch and Purified Air contacted for further information.

5.4.1 Switching the UV-O 500 Unit Off

To switch the Unit off, turn the Rotary Mains Isolation Switch
(See figure 22 - Installation of Rotary Mains Isolation Switch on page 21)
to the 'Off' position.

Note: Both the green Power Light and blue Safety Switch Light will extinguish.



WARNING

Please contact your service agent if either the green Power Light or blue Safety Switch Light do not extinguish when the Rotary Mains Isolation Switch is in the 'Off' position.

5.5 Switching the UV-O 1000 Unit On

To start the Unit from the Control Panel:

1. Ensure that the kitchen extractor fan is running.
2. Turn on the Rotary Mains Isolation Switch (On/Off) to the 'On' position. **Note:** The green Power Light (See Figure 33 - UV-O 1000 Control Panel on page 30) will illuminate, indicating that power is being supplied to the Unit. The blue Safety Switch Light will illuminate (See Figure 33 - UV-O 1000 Control Panel on page 30), indicating that the various safety switches are engaged and that sufficient airflow is passing through the Unit.



WARNING

Please contact your service agent if either the green Power Light or blue Safety Switch Light do not illuminate when the Rotary Mains Isolation Switch is in the 'On' position.



WARNING

- If ozone can be smelt in the area where the UV-O 1000 Unit is installed, the Unit has been incorrectly installed
- It should be isolated via the Rotary Mains Isolation Switch and Purified Air contacted for further information.

5.5.1 Switching the UV-O 1000 Unit Off

To switch the Unit off from the Control Panel:

Turn the Rotary Mains Isolation Switch (On/Off) to the 'Off' position.

Note: Both the green Power Light and blue Safety Switch Light will extinguish.



WARNING

Please contact your service agent if either the green Power Light or blue Safety Switch Light don't extinguish when the Rotary Mains Isolation Switch is in the 'Off' position.

5.6 BMS Connections

Please note:

Any **BMS** connection to this unit should be **24V 0.5A max.**

The BMS relay has volt free contacts.

When the unit is isolated the BMS connection could still be LIVE.

If you have any queries regarding this please contact Purified Air Limited.

6. Maintenance

6.1 Introduction

If you carry out the simple maintenance and cleaning described below at the regular intervals, paying attention to the associated Warnings and Cautions, then any problems will mostly be detected and corrected before they result in a total breakdown of the Unit.

The indicated maintenance intervals can vary depending on specific working and local environmental conditions. It is therefore recommended that the Units are thoroughly inspected annually, in addition to the indicated periodic maintenance. Please contact your supplier for this purpose.



WARNING!

- Overdue maintenance can cause fire.
- Always switch OFF the Unit and **isolate the electric supply** before carrying out the activities below.
- Do not carry out any service, maintenance or repairs on the Unit before it has been protected against unintended starting.

6.1.1 Maintenance Schedule UV-O 500 and UV-O 1000

Basic maintenance activities can be carried out by the user. Please see the table below for the optimum frequencies for such activities.

Note: Other activities are strictly reserved for qualified personnel.

Basic Maintenance Activities	Frequency	
	UV-O 500	UV-O 1000
Clean UV Lamps See paragraph 6.2.1. Cleaning the UV-O 500 lamps on page 34 and paragraph 6.3.1. Cleaning the UV-O 1000 Lamps on page 37	Every 2 months (depending on degree of pollution)	
Replace UV Lamps paragraph 6.2.2. Replacing the UV-O 500 Lamps on page 35 and paragraph 6.3.2. Replacing the UV-O 1000 Lamps on page 37	Every 12 months	

Basic Maintenance Activities	Frequency	
	UV-O 500	UV-O 1000
Replace Filter See paragraph 6.3.3. Replacing the UV-O 1000 Filter on page 38	Not Applicable	Every 2 months (Depending on degree of pollution)
Clean the inside of the Unit and remove dust/ grease See paragraph 6.2.4. Cleaning the Inside of the UV-O 500 on page 36 and paragraph 6.3.4. Cleaning the Inside of the UV-O 1000 on page 39	Every 3 months	

**CAUTION**

Observe the maintenance intervals given in this manual.

Overdue maintenance can lead to high repair costs and modifications can render the warranty null and void.

Always use tools, parts and service techniques that have been approved by the manufacturer.

6.2 Cleaning and Maintenance Tasks - UV-O 500

It is a matter of experience to determine when your UV-O 500 Unit needs to be cleaned as the nature and degree of any pollution depends strongly on factors such as the particular location, humidity and the intensity of use etc. Nevertheless, the UV lamps should be cleaned and the inside of the Units cleaned regularly, at intervals not exceeding 3 months, using the procedures outlined in the sections below:

6.2.1 Cleaning the UV-O 500 lamps

**WARNING**

Appropriate PPE equipment should be worn at anytime when there is a possibility that the light emitted from the UV lamps can be viewed or come into contact with skin.

To clean the UV-O 500 lamps:

1. Isolate the Unit from the mains power supply by turning the Rotary Mains Isolation Switch to the 'Off' position.
2. Double check that the mains power supply has been isolated and that the Power Light is 'Off'.

3. Undo the lock on the Front Panel and open it.
4. Slide the lamps to the right to disengage them from their plugs (See Figure 34 - UV-O 500 UV Lamp Plugs below).
5. Remove the lamps from their clips (See Figure 35 - UV-O 500 Lamp Clips on page 36).
6. Clean the lamps by wiping them with alcohol wipes or a lint free cloth soaked in isopropyl alcohol and dry with a lint free cloth.

Note: Natural oily deposits left by fingers and palms create an opaque mark on the lamp thereby reducing the UV transmission. These marks also cause the quartz to break down, causing premature lamp failure. Use caution when cleaning near the ends of the lamps excessive pressure may remove or smear the coating protecting the lamp electrodes.

It is a matter of experience to determine when the UV lamps need to be cleaned, since the nature and the degree of pollution depend strongly on factors such as the particular location, environmental conditions and intensity of use, etc.

Note: Whatever the situation, however, the UV lamps should be cleaned regularly according to the schedule (See 6.1.1 Maintenance Schedule UV-O 500 and UV-O 1000 on page 33).

6.2.2 Replacing the UV-O 500 Lamps

1. Replace the lamps in their clips (See Figure 35 - UV-O 500 Lamp Clips on page 36).
2. Slide the lamps to the left to engage them with their plugs (See Figure 34 - UV-O 500 UV Lamp Plugs on page 35).
3. Close the Front Panel and fasten the lock.
4. Switch on the mains power supply to the Unit by turning the Rotary Mains Isolation Switch to the 'On' position.



Figure 34 - UV-O 500 UV Lamp Plugs



Figure 35 - UV-O 500 Lamp Clips

6.2.3 Replacing the UV-O 500 Filter

Not Applicable.

6.2.4 Cleaning the Inside of the UV-O 500

Having disconnected the mains power supply to the Unit, opened its Front Panel and removed the UV Lamps (See 6.2.1 Cleaning the UV-O 500 lamps on page 34):

Spray a suitable cloth or paper towel with a high quality degreaser and wipe over the Unit's internal surfaces.

- Ensure that the lamp holders and plugs are free from contaminants/grease.
- Ensure that the rubber door seal is undamaged and free from contaminants/grease, cleaning it with warm soapy water if necessary.



CAUTION

Ensure that all internal surfaces and the UV lamp plugs are completely dry before replacing the lamps, closing the Front Panel and turning the Rotary Mains Isolation Switch to 'ON'.

6.3 Cleaning and Maintenance Tasks - UV-O 1000

It is a matter of experience to determine when your UV-O 1000 Unit needs to be cleaned as the nature and degree of any pollution depends strongly on factors such as the particular location, humidity and the intensity of use etc. Nevertheless, the UV lamps should be cleaned and the inside of the Units cleaned regularly, at intervals not exceeding 3 months, using the procedures outlined in the sections below:

6.3.1 Cleaning the UV-O 1000 Lamps

To clean the UV-O 1000 lamps:

1. Isolate the Unit from the mains power supply by turning the Rotary Mains Isolator Switch to the 'Off' position.
2. Double check that the mains power supply has been isolated.
3. Undo the lock, unscrew the four Star Knobs anti-clockwise on the Front Panel and open it.
4. Slide out the UV Lamp Holder on the Runner System (See Figure 28- Lamp Holder and Runner System on page 27).
5. Carefully remove plugs from the end of the lamps (See Figure 28 - Lamp Holder and Runner System on page 27).
6. Remove the lamps from their clips (See Figure 28 - Lamp Holder and Runner System on page 27).
7. Clean the lamps by wiping them with alcohol wipes or a lint free cloth soaked in isopropyl alcohol and dried with a lint free cloth.

Note: Natural oily deposits left by fingers and palms create an opaque mark on the lamp thereby reducing the UV transmission. These marks also cause the quartz to break down, causing premature lamp failure. Use caution when cleaning near the ends of the lamps excessive pressure may remove or smear the coating protecting the lamp electrodes.

It is a matter of experience to determine when the UV lamps need to be cleaned, since the nature and the degree of pollution depend strongly on factors such as the particular location, environmental conditions and intensity of use, etc.

Note: Whatever the situation, however, the UV lamps should be cleaned regularly according to the schedule outlined in (See 6.1.1 Maintenance Schedule UV-O 500 and UV-O 1000 on page 33).

6.3.2 Replacing the UV-O 1000 Lamps

1. Replace the lamps in their clips (See Figure 29 - Lamp Clips on page 28).
2. Replace the plugs on the end of the lamps (See Figure 30 - Lamp Plugs on page 28).
3. Slide in the UV Lamp Holder on the Runner System (See Figure 28 - Lamp Holder and Runner System on page 27).
4. Close the Front Panel, screw the four Star Knobs clockwise to tighten them and fasten the lock.
5. Switch on the mains power supply to the Unit by turning the Rotary Mains Isolator

Switch to the 'On' position.

6.3.3 Replacing the UV-O 1000 Filter

1. Isolate the Unit from the mains power supply by turning the Rotary Mains Isolator Switch to the 'Off' position.
2. Double check that the mains power supply has been isolated.
3. Undo the lock, unscrew the four Star Knobs anti-clockwise on the Front Panel and open it.
4. Remove the old filter element by sliding it out of its housing inside the Unit's main body, on the left-hand side.
5. Spray the filter housing and mounting with a high quality degreaser and wipe down with a suitable cloth or paper towel.
6. Insert the new filter element by sliding it into the housing inside the Unit's main body.

Note: Ensure that the filter element is inserted in the correct orientation, with the arrows printed on the end of the filter's frame pointing in the direction of the airflow through the Unit.



CAUTION

Ensure that the filter housing and mounting are completely dry before inserting the new filter, closing the Front Panel and reconnecting the mains power supply.

7. Close the Front Panel, screw the four Star Knobs clockwise to tighten them and then fasten the lock.
8. Switch on the mains power supply to the Unit by turning the Rotary Mains Isolator Switch to the 'On' position.



Figure 36 - UV-O 1000 Air Filter

6.3.4 Cleaning the Inside of the UV-O 1000

1. Isolate the Unit from the mains power supply by turning the Rotary Mains Isolator Switch to the 'Off' position.
2. Double check that the mains power supply has been isolated.
3. Undo the lock, unscrew the four Star Knobs anti-clockwise on the Front Panel and open it.
4. Remove the UV lamps (See 6.3.1 Cleaning the UV-O 1000 Lamps on page 37) and filter (See 6.3.3 Replacing the UV-O 1000 Filter on page 38).
5. Spray a suitable cloth or paper towel with a high quality degreaser and wipe over the Unit's internal surfaces.
 - Ensure that the lamp holders and plugs are free from contaminants/grease.
 - Ensure that the rubber door seal is undamaged and free from contaminants/grease, cleaning it with warm soapy water if necessary.
6. Replace the UV lamps (See 6.3.2 Replacing the UV-O 1000 Lamps on page 37) and filter (See 6.3.3 Replacing the UV-O 1000 Filter on page 38).
7. Close the Front Panel, screw the four Star Knobs clockwise to tighten them and fasten the lock.
8. Switch on the mains power supply to the Unit by turning the Rotary Mains Isolator Switch to the 'On' position.



CAUTION

Ensure that all internal surfaces and the UV lamp plugs are completely dry before replacing the UV lamps and filter, closing the Front Panel and turning the Rotary Mains Isolator Switch to 'ON'.

7. Troubleshooting

If your UV-O Unit does not function correctly, consult the checklist below to see if you can correct the error yourself.



INFORMATION

A number of problems in the checklist below can also be caused by defects in equipment connected to the Unit. This manual only deals with problems and solutions directly related to the Unit itself.

Problem	Possible Cause	Solution
If either of the indicator lights go out		Contact Purified Air
If both of the indicator lights go out	Loss of Electric Power	Check that power is going to the Unit. If not, turn on the power.
		If there is power to the Unit contact Purified Air.



CAUTION

Should it not be possible to correct the error, consult a qualified service engineer.

8. Commissioning Waiver

Due to the danger of exposure to UV light in unprotected conditions, commissioning is normally carried out by Purified Air engineers. These engineers are fully trained and carry protective equipment to ensure that they and others are not harmed when working on the Unit.

Should the customer decide to carry out the final commissioning of the Unit, a Commissioning Waiver will have to be signed and returned to Purified Air.

Special safety locks are fitted to this equipment.

The customer owns the Unit and is entitled to have keys to it. However, before releasing keys to the customer Purified Air require a Director of the company to sign a Commissioning Waiver acknowledging that it is fully understood about the dangers associated with this Unit and will take every precaution to ensure that no person comes to harm when accessing the Unit. Furthermore the customer takes full responsibility for any injury caused due to the Unit being incorrectly accessed or been left unattended or accessible.

Once the Commissioning Waiver has been signed and returned to Purified Air a set of keys for the Unit will be supplied.

9. Wiring Diagrams

9.1 UV-O 500

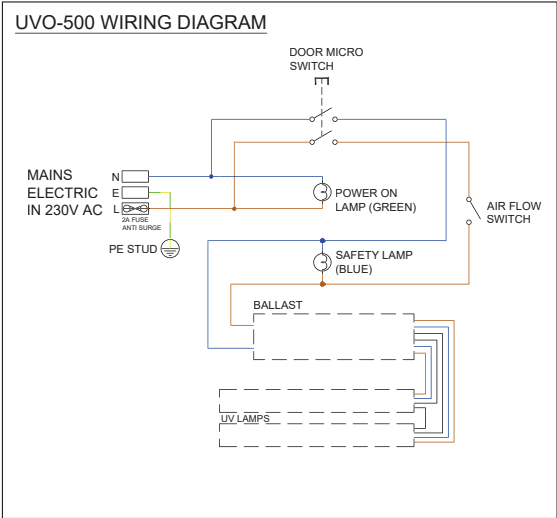


Figure 37 - UV-500 Unit Wiring Diagram

9.2 UVO 500 BMS

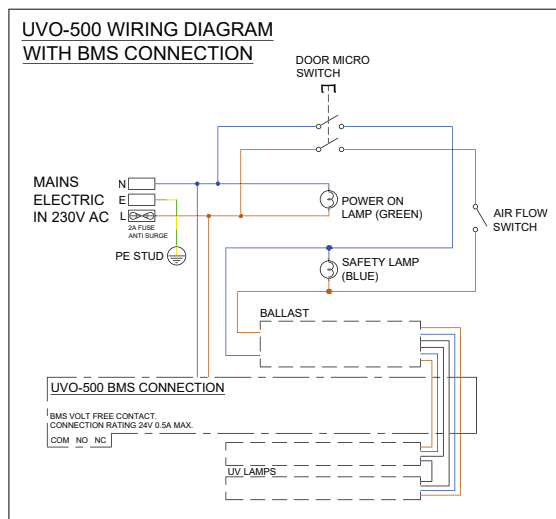


Figure 38 - UV-500 BMS Unit Wiring Diagram

9.3 UV-O 1000

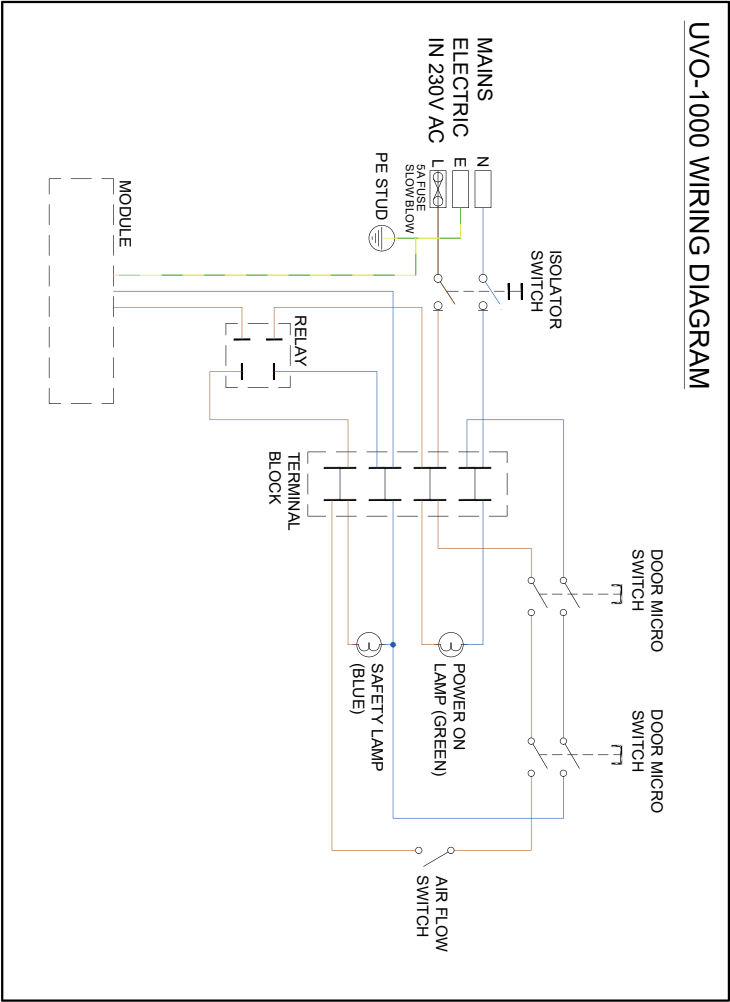


Figure 39 - UV-O 1000 Unit Wiring Diagram

9.4 UV-O 1000 BMS

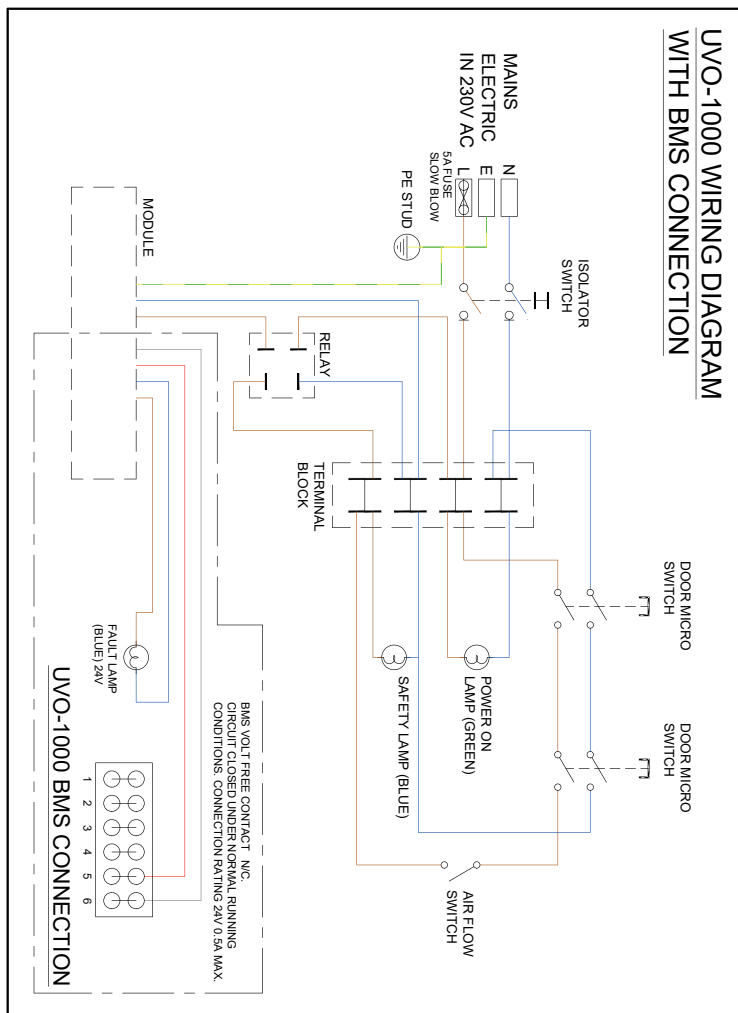


Figure 40 - UV-O 1000 BMS Unit Wiring Diagram

10. Equipment Disposal



10.1 Packaging Material Disposal



INFORMATION

The Unit's packaging materials are manufactured from recyclable materials in accordance with applicable local regulations.

The purpose of the packaging is to protect the Unit during transport. It consists of the following substances that can be reused:

- Cardboard (corrugated)
- Wood (untreated) if palletized

Do not dispose of the packaging material in the industrial waste.

10.2 Used Unit Disposal

Units to be disposed of may still contain valuable substances and materials.

Do not dispose of the Unit in the industrial waste.



WARNING

LAMPS CONTAIN MERCURY (Hg), dispose of in accordance with local disposal laws

11. Contact Details

At Purified Air, we pride ourselves on our excellent levels of customer service and maintenance.

11.1 Nationwide Coverage

We have hubs in both Manchester and London and can offer nationwide coverage with teams of directly employed service engineers.

For all Service and Maintenance enquiries, please contact via:

service@purifiedair.com

0800 018 4000

11.2 Service and Maintenance Contracts

With every installation, we offer the opportunity to sign up for one of our service and maintenance contracts. These are structured to suit individual needs, on a post pay basis with the customer only being invoiced after each service, saving them both time and money against ad hoc servicing requests.

11.3 Dependability

So, whether you have our commercial kitchen exhaust filtration equipment in your restaurant, cafe or take away, you can rest assured that we will always be there when you need us.

11.4 Global Sales

For all installations of our equipment outside of the UK, please refer back to your designated distributor.

12. Warranty Statement

Your new UV-O Unit is guaranteed against the cost of breakdown repairs for one year from the date of the original purchase.

The manufacturer does not accept any liability for damage to the Unit or personal injury caused by non-observance of the safety instructions in this manual or negligence during the installation, use, maintenance and repair of the models mentioned on the cover of this manual and any associated accessories.

What is covered?

- Repairs necessary as a result of faulty materials, defective components or manufacturing defect.
- The cost of functional replacement parts, but excluding consumable items.
- The labour costs of a Purified Air approved repairer to carry out the repair.

What is not covered?

- Transit, delivery or accidental damage or misuse and abuse.
- Any installation which fails to meet the installation, location and operating requirements and parameters outlined in this manual.
- Manufacturing defects only affecting the Unit's cosmetic appearance.
- Consumable items including, but not limited to, the UV lamps.
- Repairs required as a result of unauthorised repair or installation by anyone other than a Purified Air approved installer.
- Any damage caused to the Unit by its use by anyone other than authorised, trained and qualified users or personnel under the supervision and responsibility of authorised, trained and qualified users.
- Any damage caused to the Unit by incorrect servicing procedures.
- Use of the Unit in any application which is not specifically mentioned in this manual or approved, in writing, by the manufacturer.
- The guarantee is applicable only to new products and is not transferable if the product is resold.

Purified Air disclaims any liability for incidental or consequential damages.

The guarantee does not in anyway diminish your statutory or legal rights.

Please keep your purchase receipt or other proof of purchase in a safe place. you will need to have it should the product require attention under guarantee.

13. Certification

13.1 EC Declaration of Conformity - UV-O 500 and UV-O 1000

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www.purifiedair.co.uk

purifiedair



EC Declaration of Conformity

Document Number: DoC UVC 1201

We; Purified Air Limited at above address, declare the products detailed below comply with the requirements of the following EU Directives,

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility Directive 2004/108/EC
- RoHS Directive 2011/65/EU

Equipment description	<i>UV-C Odour Control</i>		
Make/Brand	<i>PurifiedAir</i>		
Model reference	<i>UVO 500</i>	<i>UVO 1000</i>	
	<i>UVC 1500</i>	<i>UVC 3000</i>	<i>UVC 4500</i>

Compliance of the equipment has been assessed with respect to the essential requirements and with reference to the following harmonised standards:

- EN 61347-1:2008
- EN 61547:2009
- EN 55015:2006 + A2:2008
- EN 61000-3-2:2006 + A2:2009
- EN 61000-3-3:2008

A technical file for this equipment is retained at the above address

Gareth Smith - Technical Director.
Purified Air Limited
June 2017



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