DESIGN NOTE

BDP.

MEP ENGINEERING

PROJECT	The Factory, Manchester	ISSUE DATE	31.10.2023
PROJECT NUMBER	P2008093	ISSUED BY	AM
REFERENCE	MF-BDP-XX-XX-DN-MX-11-0096	APPROVED BY	SM
REVISION	C06	PURPOSE OF ISSUE	S2

SUBJECT **DN96 – KITCHEN EXTRACT NOTES**

INTRODUCTION

The kitchen extract installation in arch 3 of Factory is subject to planning condition 12.

12	Should kitchens be installed, **fumes, vapours and odours** shall be extracted and discharged from the premises in accordance with a scheme to be submitted for each unit and approved in writing by the City Council as local planning authority before the use commences. Any works approved shall be implemented before the use commences and shall be retained thereafter. Mixed use schemes shall ensure provision for internal ducting in risers that terminate at roof level. Schemes that are outside the scope of such developments shall ensure that flues terminate at least 1m above the eave level and/or any openable windows/ventilation intakes of nearby properties.

The kitchen has always been a proposition for the fit out so full details have not been previously available.

There is now a catering team on board and the fit out is progressing so the information that is required to discharge this planning condition is believed to be complete.

SITUATION

The kitchen is situated in arch 3 of Factory and as part of the base build the extract from the kitchen was routed internally up to the main roof in fire rated ductwork so as not to present a nuisance to the adjacent bonded warehouse.

The base build scheme also provided for ducted make-up air to the kitchen via the adjacent buffer storage in accordance with BESA design standard DW172.

Details of the ductwork and fan selection form part of the BDP and CHt scheduled and drawn information.

The food offering and internal planning of the kitchen, together with the treatment of the exhaust have been provided as part of the fit-out package.

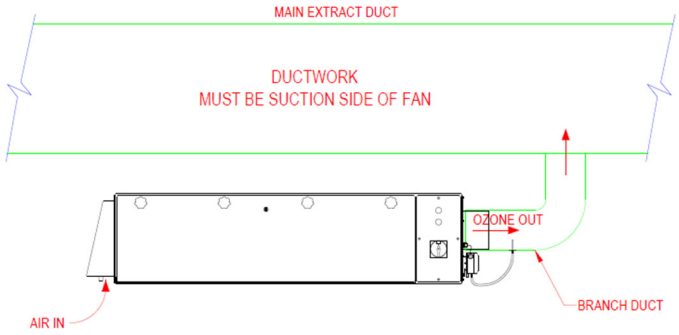
A risk assessment has been carried out following the structure of Appendix 3 of the EMAQ+ document “Control of Odour and Noise from Commercial Kitchen Exhaust Systems: 2018 (previously Netcen 2005).as follows: -

Criteria	Score
Dispersion	10
Proximity	10
Size	5
Cooking type	10
Total	**35**

This suggests a high level of odour control (20-35).

This is provided by the internal grease filters in the canopy, the local Ozone/UV filters, to treat the odours, injecting into the ductwork in the kitchen and the rooftop ESP filters to treat the FOG.

Note that the UVO filters are not directly in the duct from the canopy, the units are mounted remotely and are ducted to the discharge duct from the canopy where the treated air mixes with the canopy extract on the suction side of the fan.



Placing the UV/ozone filters before the ESP filters and as far from the discharge point will ensure that the contact time with the UV/ozone is maximised.

The ESP are on the roof by necessity as they could not fit in the kitchen and fire rated units were not available to fit in the available space in the buffer store.

The impact of this arrangement is that the ductwork and equipment will require more regular cleaning to avoid the build-up of grease that impairs the performance of the UV and ozone.

Level Acoustics have also reviewed the system and recommended the performance requirements of the inlet and discharge silencers in order that the installation complies with the agreed external noise criteria and the internal noise level limits set for the kitchen.

The items below are the relevant pieces of information that have been drawn together to discharge the kitchen extract ventilation planning condition.

- MF-BDP-ZZ-ZZ-SH-M-68-0039 Kitchen extract fan schedule
- MF-CHT-WH-GF-DR-M-57-0000 Warehouse Ground Floor Ventilation Layout (Sheet 1 of 4)
- MF-CHT-WH-XX-DR-M-50-0202 Coordinated MEP Services Opera XL to Buffer Room Riser
- MF-CHT-WH-L3-DR-M-50-0700 Warehouse Third Floor Plantdeck Multi-Service Layout Sheet 1 of 2
- MF-CHT-WH-XX-DR-M-50-0201 Warehouse Tower Riser Mech 02 (Sheet 2 of 2)

- kitchen duct to roof (a collage of the information presented in the above CHT drawings
- Caice - Kitchen extract attenuator schedule (redacted to chosen selection)
- Kitchen extract schematic

We also understand that a typical food offering has been planned for the kitchen as below: -

- Foyer Food- Fac V1

And Factory international have provided the following document for the service and maintenance: -

- FI Aviva Cleaning Maintenance of Kitchen Extraction 12 Oct 2023 w Appendices v0.pdf

The above schedules, drawings, sketches and equipment details are appended to this note.

CONCLUSION

The kitchen extract fume strategy has been developed in accordance with DW 172, CIBSE guide B and guidance within the EMAQ+ document.

The equipment has been installed to ensure that fumes, vapours and odours are extracted and discharged from the premises in accordance with the requirements of the planning condition 12.

The ventilation system design is based on the installation of a high-quality specialist canopy to extract above the cooking equipment.

The canopy is fitted with a fire suppression system and has integral baffle filters, the duct from the canopy is provide with UV ozone injection modules installed within the kitchen space to provide odour suppression as BAC-11641C RevC Kitchen Extract Canopy Assembly.

A 100% mechanical make-up air system is provided as part of the base build in compliance with DW 172.

The exhaust from the kitchen passes through the fire compartment line and in accordance with DW 172 approved document B, the duct is fire rated from this point to the point where it passes out onto the roof of the building.

Access for cleaning is provided at each level and along the length of the duct as required in DW144 and DW 172.

The exhaust equipment on the roof comprises ESP units to control any carry over of fume and grease before the airflow enters the extract fan and is discharged to the roof – refer to Kitchen exhaust at roof level 7.5 – Ventorex Ductwork drawing.

Noise attenuation is provided with silencers before and after the bifurcated kitchen extract fan as defined by Level Acoustics.

Roof plant is accessible through the permanent stair ways, walkways and access equipment that is provided to the main roof and the tower roof.

P2008093 - Factory

Title Kitchen Extract Fan Schedule

Doc No: MF-BDP-ZZ-ZZ-SH-M-68-0039
Issue: Contract Issue
Rev: C06
Produced by: AM
Published Date: 05.12.2022

EET
ASIN
M60 3JA
2200

BDP.

P2008093

REV	DESCRIPTION	ORIG	REVIEW	DATE
C01	Contract Issue	JL	AM	16.08.2019
C02	Contract Issue - amendments in red	JL	AM	08.11.2019
C03	Contract Issue Kitchen Extract fan KEF 01 in abeyance awaiting catering specialist input	AM	CC	05.05.2020
C04	Contract Issue Kitchen extract volume reduced to 4.0 m^3/s, fan labels amended, location corrected to green room	AM	CC	09.10.2020
C05	Contract Issue Green room kitchen extract fan changed to in line fan at 60 deg C operating temperature	AM	CC	18.12.2020
C06	Contract Issue Kitchen extract fan KEF01 taken out of abeyance	AM	CC	05.12.2022

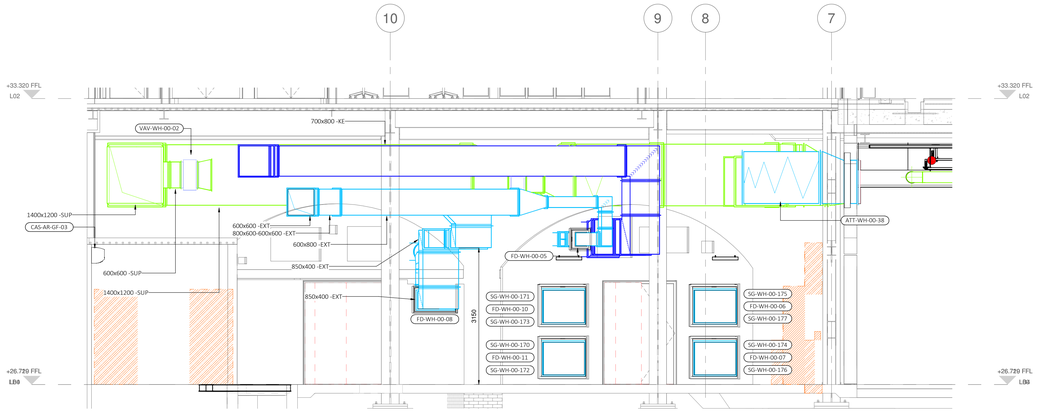
EQUIPMENT SCHEDULE

Project title	**Factory**	Schedule title	**Kitchen Extract Fan Schedule**	Date	**05.12.2022**
Project no	**P2008093**	Schedule ref	**MF-BDP-ZZ-ZZ-SH-M-68-0039**	Revision	**C06**

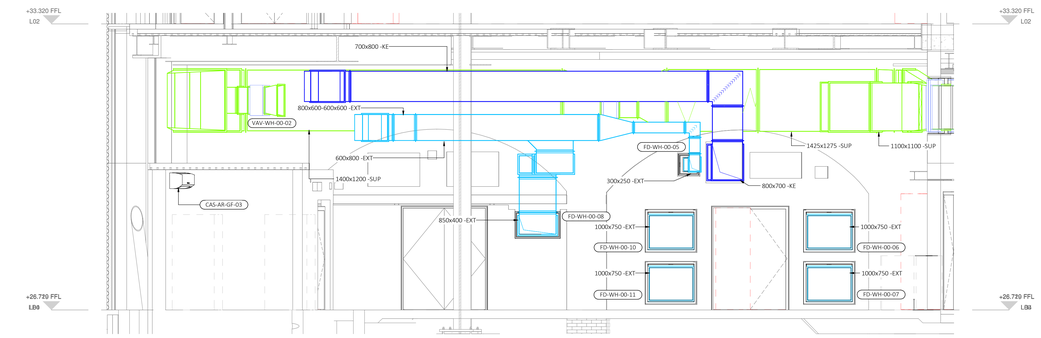
Equipment Details

Manufactured to meet the requirements of the performance data below based on Elta fans or equal:

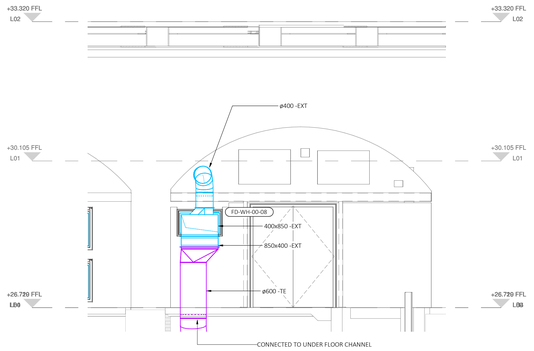
Fan Ref	KEF-WH-08-01	KEF-WH-03-02	Removed for Contract Issue	Removed for Contract Issue	Removed for Contract Issue
General Requirements					
Number off	1	1			
System	kitchen extract	Green room			
Model		SCC250-1EC			
Location	Level 1	Level 3			
Type	Axial - bifurcated	duct mounted centrifugal			
Drive Type	Direct	Direct			
Single or Twin	Single	Single			
Mounting Arrangement	Internal	External			
Special Requirements					
Fluid	N/A	N/A			
Temperature Rating	N/A	60 deg C			
ATEX	N/A	N/A			
Components and Construction					
Fan Casing	Galv mild steel	corrosion protected mild steel			
Finish	Painted	Powder coated polyester epoxy paint			
Impellers	Cast Aluminium	dynamically			
Shafts		balanced to ISO 14694 Grade G6.3			
Performance					
Standards	BS 848	BS EN 10142			
Operating Temperature	-10 to +100	-10 to + 60			
Design Flow Rate (m^3/s)	4 (to be confirmed by catering specialist)	0.12			
Design Differential Pressure (Pa)	300 (Provisional)	200			
Speed					
Specific Fan Power (w/l/s)	N/A	0.66			
Noise Level (inlet) (dBA @ 3m)	Manufacturer to confirm	44			
Noise Level (outlet) (dBA @ 3m)	N/A	44			
Motors					
Type	TEFC 3 Ph squirrel cage induction motor	EC motor			
Protection	IP55	IP54C			
Mounting Arrangement	External	External			
Efficiency Class	IE3	IE3			
Bearings	Maintenance free	Maintenance free			
Motor finish	Epoxy coated	Epoxy coated			
Electrical Supply	400v/3Ph	230v/1Ph			
No of speeds	Variable	Variable			
Method of start	Frequency Inverter	soft start			
Method of control	Variable Speed	electronic speed control			
Motor rating (kW)	TBC	0.17			
Full load current/Starting Current (A)	TBC	1.5/-			
Thermistors	No	No			
Accessories					
Mounting Feet	Yes	Yes			
Anti-Vibration Mounts	Yes	Yes			
Flexible connections	Yes	Yes			
Fan / Drive Guard	Yes	Yes			
Inlet Cone					
Terminal Box	Yes	Yes			
Anti-Stall Sensor					
Silencers	Not Required	Required			
Speed Controller	Inverter Drive	speed selector			
Other					



A **WH L00-57 Mech Vent Section A**
1 : 50



B **WH L00-57 Mech Vent Section B**
1 : 50



C **WH L00-57 Mech Vent Section C**
1 : 50



DYNAMIC RISK ASSESSMENT

PPE
Is it fit for purpose, appropriate for task, in good condition

HOUSEKEEPING
Before you start is your area? Clean and tidy, free from trip hazards, with all waste in appropriate bins, has a safe route for 110V trailing leads.
Before you finish ensure your area has no hazards for the next shift

TOOLS & EQUIPMENT
Are they? In good working order, PAT tested, correct for task

WORK
Do you? Understand your scope of works, have the required skills to carry out tasks, have a Method Statement and Risk Assessment to cover tasks, need to work at height, if yes, you will require a Permit to Work, have any abnormal lifts require a Lifting Plan.

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CONSULTANT :	MF-BDP-XX-XX-M3-MX-00-0001
ARCHITECTURE :	MF-OMA-XX-XX-M3-A-00-0001
	MF-RYD-XX-XX-M3-A-00-0001
STRUCTURAL :	MF-BHE-XX-XX-M3-S-00-0002

KEY PLAN:



LEGEND

SE	-SMOKE EXTRACT	EG	-EXTRACT GRILLE
E	-GENERAL EXTRACT	SD	-SUPPLY DIFFUSER
S	-GENERAL SUPPLY	DEG	-DIRTY EXTRACT GRILLE
TS	-TOILET SUPPLY	VCD	-VOLUME CONTROL DAMPER
FA	-FRESH AIR	SBD	-SINGLE BLADE DAMPER
DE	-DIRTY EXTRACT	FSD	-FIRE-SMOKE DAMPER
FE	-FUME EXTRACT	CVD	-CONSTANT VOLUME DAMPER
TE	-TOILET EXTRACT	AP	-ACCESS PANEL
MAKE UP AIR	-MAKE UP AIR	FD	-FIRE DAMPER
COMMON EX	-COMMON EXHAUST		
EX	-EXHAUST	FOB	-FLAT ON BACK
		FOF	-FLAT ON FRONT
[-99]	-DUCT ELEVATION BELOW SOFFIT	FOL	-FLAT ON LEFT
[+99]	-DUCT ELEVATION ABOVE FFL	FOR	-FLAT ON RIGHT
BOD	-BOTTOM OF DUCT		
BOE	-BOTTOM OF EQUIPMENT		
CL	-CENTER LINE OF DUCT		
TA	-TO ABOVE		
TB	-TO BELOW		
FA	-FROM ABOVE		
FB	-FROM BELOW		

30 MINUTES FIRE RATED WALL
60 MINUTES FIRE RATED WALL
90 MINUTES FIRE RATED WALL
120 MINUTES FIRE RATED WALL
DUCT SOUND INSULATION IN ACCORDANCE WITH LEVEL PERFORMANCE SPECIFICATION
FIRE RATED INSULATION

NOTES

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4. FOR THE SPECIFICATION OF ACOUSTIC TREATMENT IN RELATION TO THE VENTILATION SYSTEM, PLEASE SEE LEVEL ACOUSTICS REPORT: MF-LEV-XX-XX-RP-XA-01-016.
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Rev	Date	Revision	Drn	Chk
AB01	24/07/23	AM - As Maintained	DC	DAC
C05	26/05/22	Design team comments incorporated. MEP Services modified to suit Ryder builders work openings. Issued for Construction.	RJD	DAC
C04	04/11/21	Design team / Site team comments from A-Site incorporated.	RJD	DAC
C03	25/05/21	Latest Design Team Comments Incorporated - Attenuation added in line with latest amended schedule	BB	DAC
C02	01/03/21	AMENDED TO SUIT LATEST BDP SCHEMATICS / LAYOUTS	BB	DAC
C01	29/07/20	Issued for Construction	MDY	DAC
P01	30/06/20	Issued for External Approval	MDY	DAC

Client:
MANCHESTER CITY COUNCIL

Status:
AM - As Maintained

Project:
THE FACTORY
MANCHESTER
MANCHESTER CITY COUNCIL

Drawing Title:
Warehouse Ground Floor
Ventilation Layout
(Sheet 1 of 4)

Architect:
OMA
Heer Bokelweg 149
3032 AD Rotterdam, Netherlands
T: +31 (0) 10 2438200

Consulting Engineer:
BDP.
11 Ducie Street,
M1 2JB Manchester,
T: +44 (0) 161 828 2200

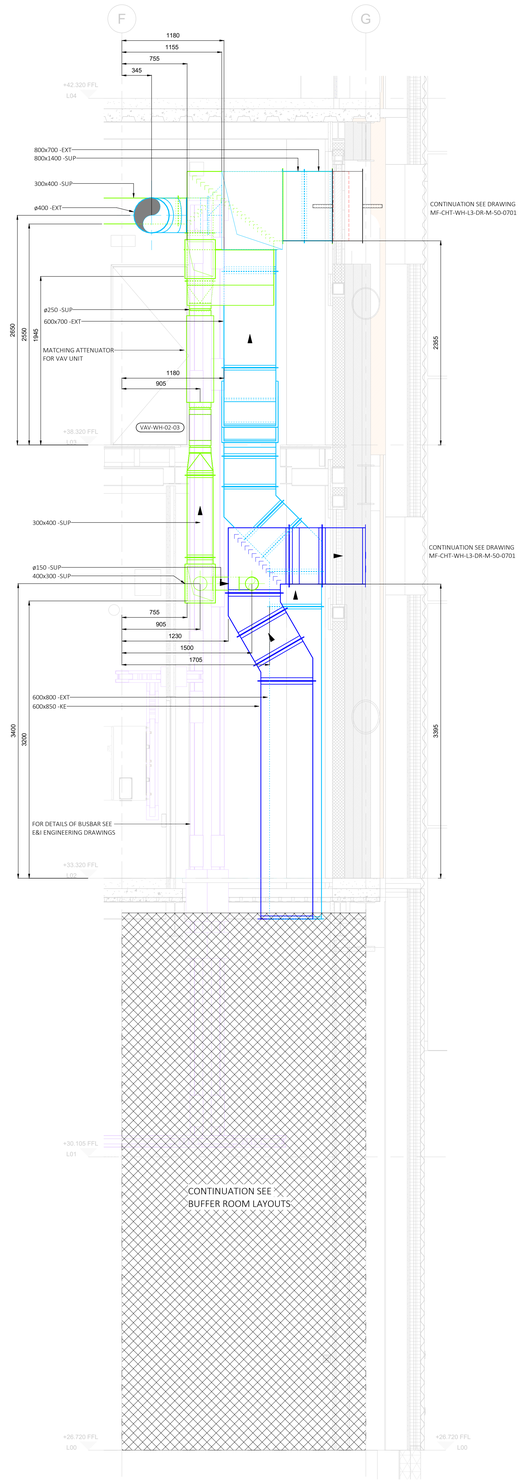
Leeds Office
Building 5, Carwood Park
Selby Road
Leeds
LS15 4LG, United Kingdom
Tel: +44 (0)1777 356075
Fax: +44 (0)1777 356076
www.crownhouse.com

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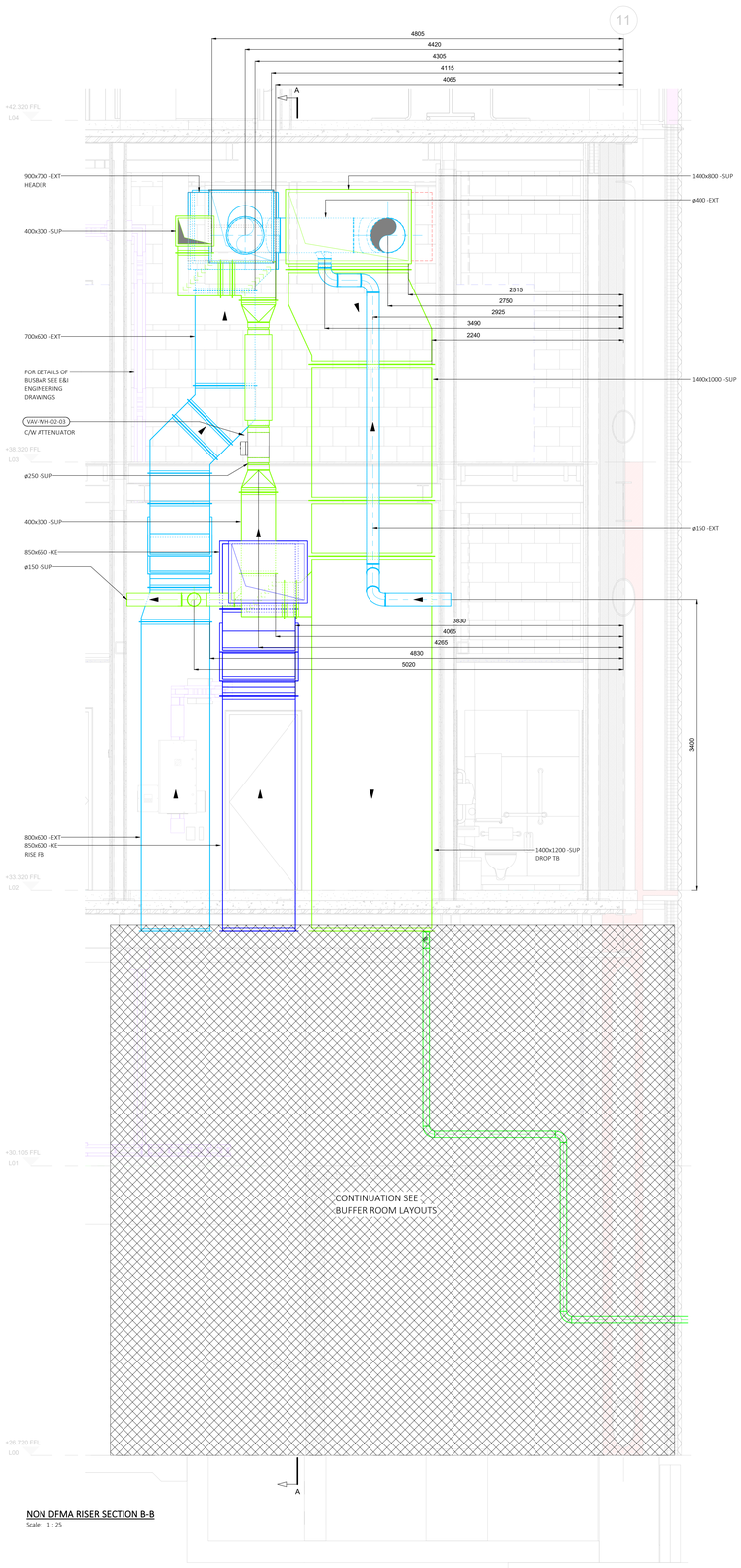
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		Approved:	JB
		Date:	22/05/20

Drawing Number: MF-CHT-WH-GF-DR-M-57-0000
Rev: AB01



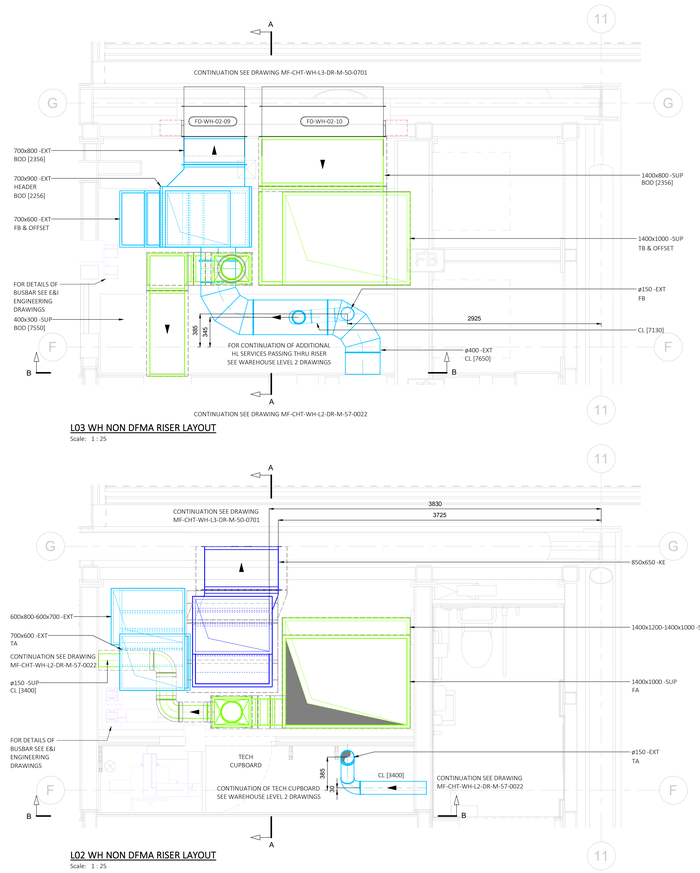
NON DFMA RISER SECTION A-A

Scale: 1 : 25



NON DFMA RISER SECTION B-B

Scale: 1 : 25



L03 WH NON DFMA RISER LAYOUT

Scale: 1 : 25

L02 WH NON DFMA RISER LAYOUT

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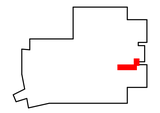
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Site Plan



CONSULTANT :	MF-BDP-XX-XX-M3-MX-00-0001
ARCHITECTURE :	MF-RYD-XX-XX-M3-A-00-0001
	MF-OMA-XX-XX-M3-A-00-0001
STRUCTURAL :	MF-BHE-XX-XX-M3-S-00-0002

LEGEND

(-99)	-DUCT ELEVATION BELOW SOFFIT
(+99)	-DUCT ELEVATION ABOVE FFL
BOD	-BOTTOM OF DUCT
CL	-℄ OF DUCT
TA	-TO ABOVE
TB	-TO BELOW
FA	-FROM ABOVE
FB	-FROM BELOW
EG	-EXTRACT GRILLE
SD	-SUPPLY DIFFUSER
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VCD	-VOLUME CONTROL DAMPER
SBD	-SINGLE BLADE DAMPER
FSD	-FIRE-SMOKE DAMPER
CVD	-CONSTANT VOLUME DAMPER
AP	-ACCESS PANEL

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Rev	Date	Revision	Chk	Drn
C01	17/08/22	ISSUED FOR CONSTRUCTION	DAC	RJD
P01	06/07/22	ISSUED FOR EXTERNAL APPROVAL	DAC	RJD

Status:
S4 FOR CONSTRUCTION APPROVAL

Project:
THE FACTORY

MANCHESTER

Drawing Title:
Coordinated MEP Services
Opera XL to Buffer Room Riser

MANCHESTER CITY COUNCIL
Albert Square, Town Hall,
M2 5DB, Manchester
United Kingdom
T +44 (0) 161 234 5004

Architect:
OMA
Heer Bokelweg 149
3032 AD Rotterdam, Netherlands
T +44 (0) 10 2438200

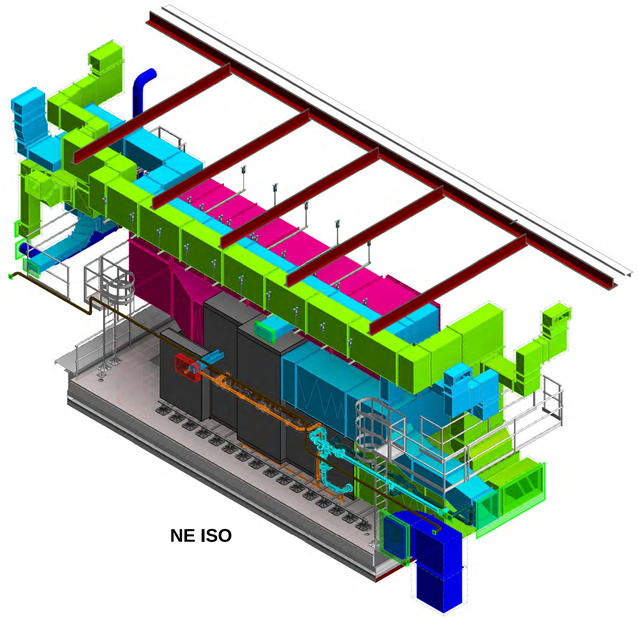
Consulting Engineer:
BDP.
11 Ducie Street
M1 2JB Manchester United Kingdom
T +44 (0) 161 828 2200

Leeds Office
Second Floor
3150 Century Way
Thorpe Park, Leeds
LS15 8ZB, United Kingdom
T +44 (0) 1777 356075
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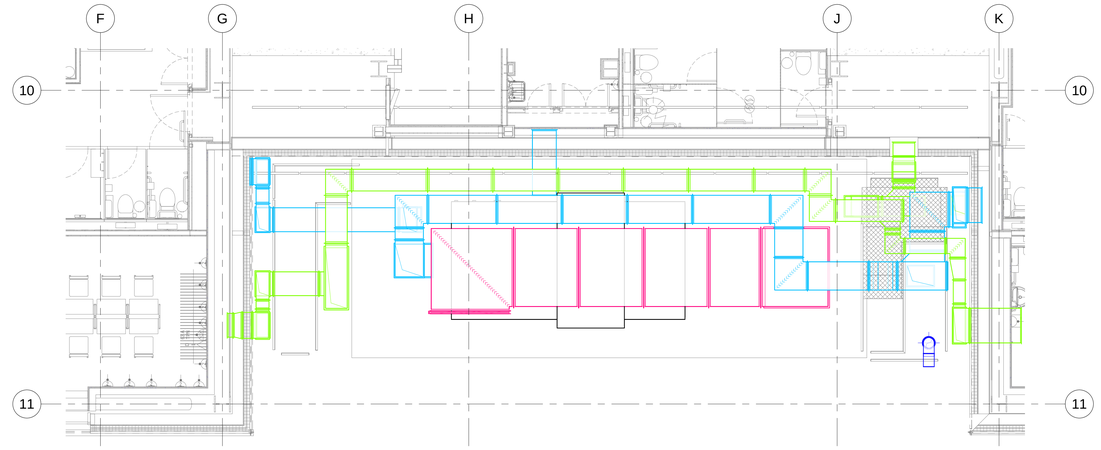
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Project:	N3844	Coordinated:	RJD
Scale:	1 : 25	Detailed:	RJD
Original Drawing Size	A0	Checked:	DAC
		Approved:	JB
		Date:	06/07/22

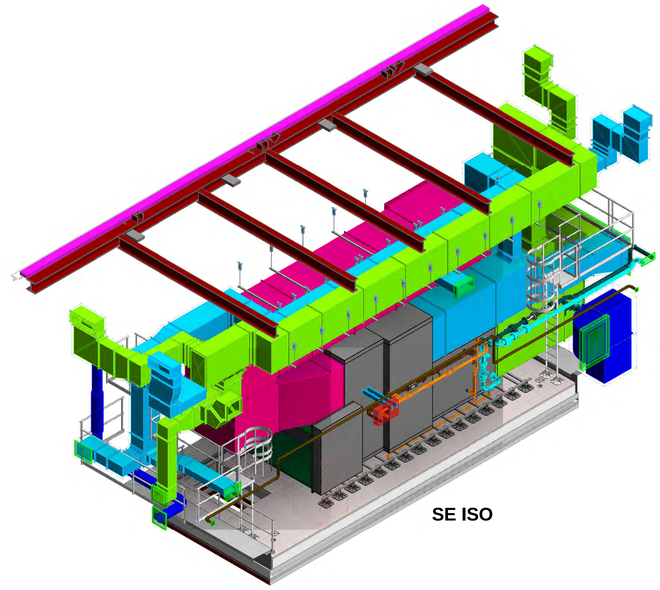
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Rev: C01



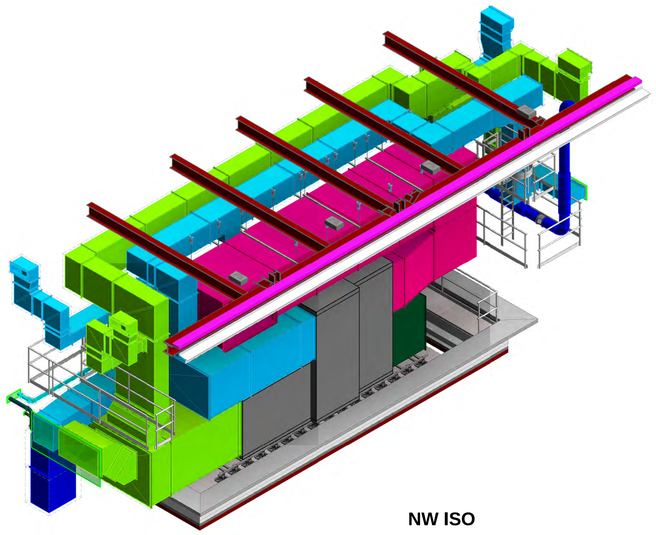
NE ISO



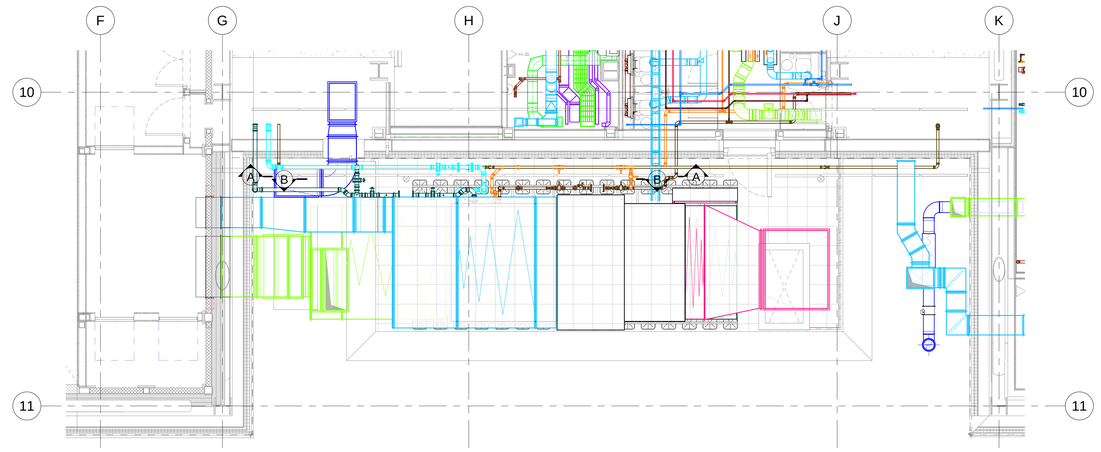
L04 to Soffit Plan Layout
1 : 50



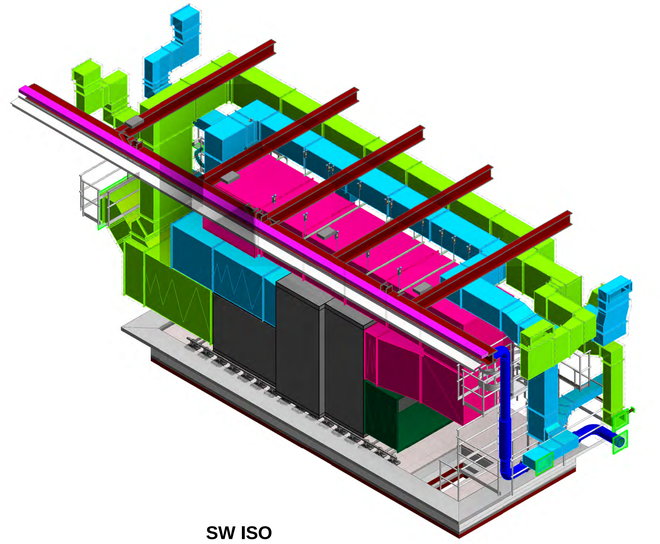
SE ISO



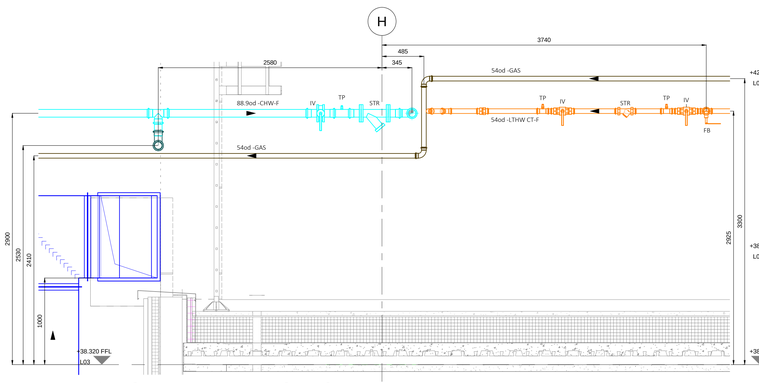
NW ISO



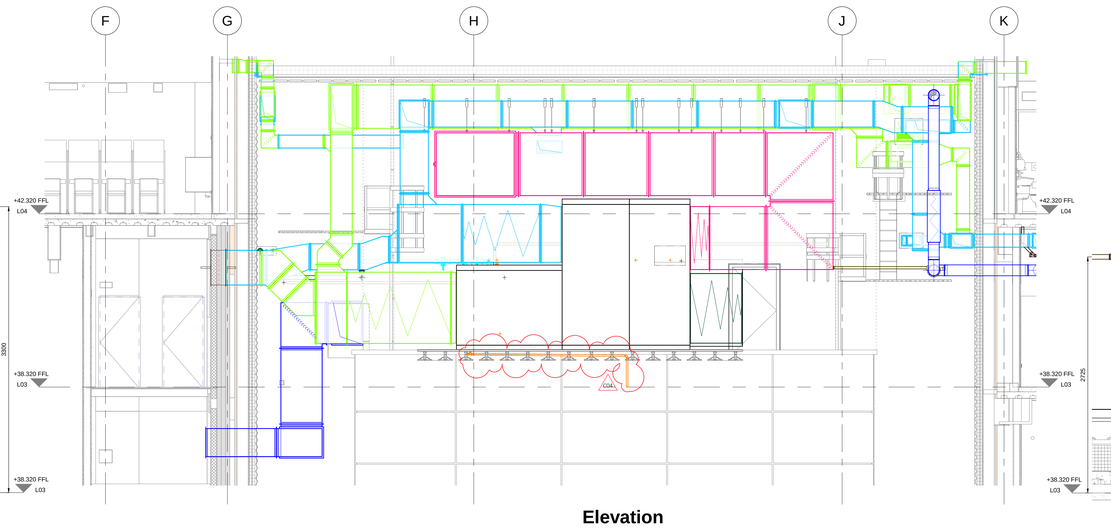
L03 to L04 Plan Layout
1 : 50



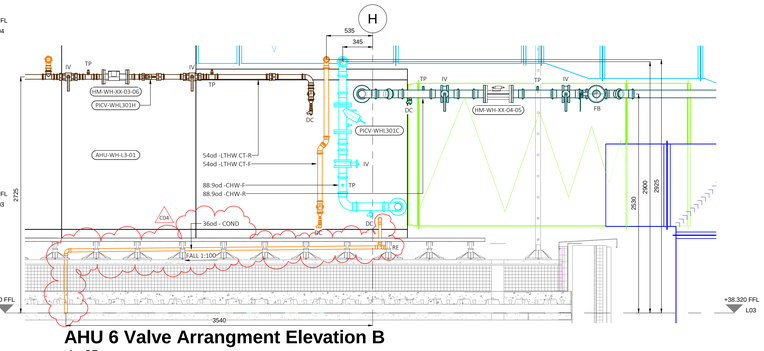
SW ISO



AHU 6 Valve Arrangment Elevation A
1 : 25



Elevation
1 : 50



AHU 6 Valve Arrangment Elevation B
1 : 25

DYNAMIC RISK ASSESSMENT

PPE
Is it? Fit for purpose, appropriate for task, in good condition

HOUSEKEEPING
Before you start is your area? Clean and tidy, free from trip hazards, with all waste in appropriate bins, has a safe route for 110V trailing leads.
Before you finish ensure your area has no hazards for the next shift

TOOLS & EQUIPMENT
Are they? In good working order, PAT tested, correct for task

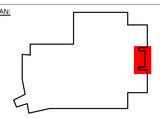
WORK
Do you? Understand your scope of works, have the required skills to carry out tasks, have a Method Statement and Risk Assessment to cover tasks, need to work at height, if so, you will require a Permit to Work, have any abnormal lifts require a Lifting Plan.

If you are unsure of anything, or you are not happy that the work you are proposing to do is unsafe then please stop and consult your Supervisor or Team Leader and do not carry out the work

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COMPUTER AIDED DRAWING - AVOID MANUAL MODIFICATION
This drawing must not be scaled. All dimensions to be checked on site.

CONSULTANT :	MF-BDP-XX-XX-M3-MX-00-0001
ARCHITECTURE :	MF-OMA-XX-XX-M3-A-00-0001
	MF-RYD-XX-XX-M3-A-00-0001
STRUCTURAL :	MF-BHE-XX-XX-M3-S-00-0002

KEY PLAN:



LEGEND

SEE DRAWING No: MF-CHT-WH-L3-DR-M-50-00701 FOR SERVICES DETAILS

STEELWORK

STEELWORK ASSEMBLY IS A NOTIONAL SOLUTION ONLY
STEELWORK DESIGN BY OTHERS

ALL LEVELS REFERENCED FROM L03 FFL

Rev	Date	Revision	Chk	Drn
C04	16/08/22	Condensate from AHU added.	DAC	RJD
C03	08/04/22	AHU valve sets modified to latest Tech Subs and due to Ryder steelwork development. New elevations added.	DAC	RJD
C02	22/11/21	Ductwork modified due to Ryder Opera XL amendments.	DAC	RJD
C01	11/11/21	BDP Comments incorporated. Amendments to ductwork into Opera XL based on BDP Design Note.	DAC	RJD
P01	16/08/21	Issued for External Approval	DAC	AR

Client:
MANCHESTER CITY COUNCIL

Status:
S4 FOR CONSTRUCTION APPROVAL

Project:
FACTORY
MANCHESTER
MANCHESTER CITY COUNCIL

Drawing Title:
Warehouse Third Floor
Plantdeck Multi-Service Layout
Sheet 1 of 2

Architect:
OMA
Heer Bokelweg 149
3032 AD Rotterdam, Netherlands
T: +31 (0) 10 2438200

Consulting Engineer:
BDP.
11 Ducie Street,
M1 2JB Manchester.
T: +44 (0) 161 828 2200

Leeds Office
Second Floor
3150 Century Way
Thorpe Park, Leeds
LS15 8ZB, United Kingdom
Tel: +44 (0)1777 356075
Fax: +44 (0)1777 356076
www.crownhouse.com
Crown House

LAING O'ROURKE

Project:	N3844
Scale:	As indicated
Original Drawing Size	A0
Coordinated:	MY
Detailed:	MY
Checked:	DAC
Approved:	JB
Date:	08/04/20

Drawing Number: MF-CHT-WH-L3-DR-M-50-0700
Rev: C04

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DYNAMIC RISK ASSESSMENT

PPE
Is it? Fit for purpose, appropriate for task, in good condition

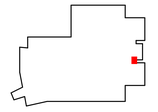
HOUSEKEEPING
Before you start is your area? Clean and tidy, free from trip hazards, with all waste in appropriate bins, has a safe route for 110V trailing leads.
Before you finish ensure your area has no hazards for the next shift

TOOLS & EQUIPMENT
Are they? In good working order, PAT tested, correct for task

WORK
Do you? Understand your scope of works, have the required skills to carry out tasks, have a Method Statement and Risk Assessment to cover tasks, need to work at height - if so - you will require a Permit to Work, have any abnormal lifts or movements - if so - is there a Lifting Plan.

If you are unsure of anything, or you are not happy that the work you are proposing to do is unsafe then please stop and consult your Supervisor or Team Leader and do not carry out the work

Site Plan



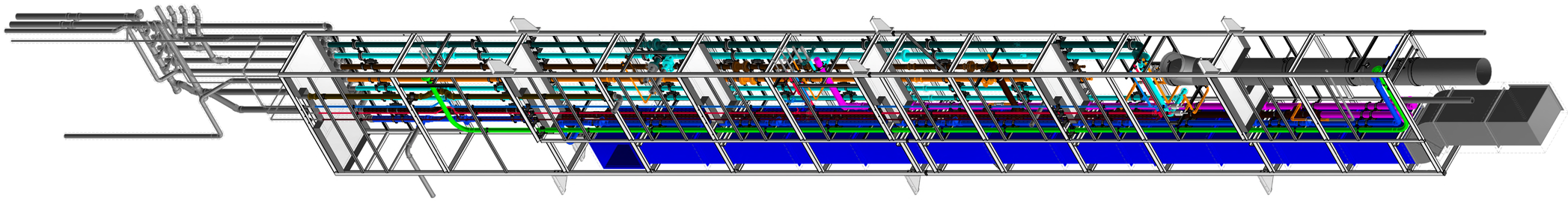
CONSULTANT :	MF-BDP-XX-XX-M3-MX-00-0001
ARCHITECTURE :	MF-RYD-XX-XX-M3-A-00-0001
	MF-OMA-XX-XX-M3-A-00-0001
STRUCTURAL :	MF-BHE-XX-XX-M3-S-00-0002

LEGEND

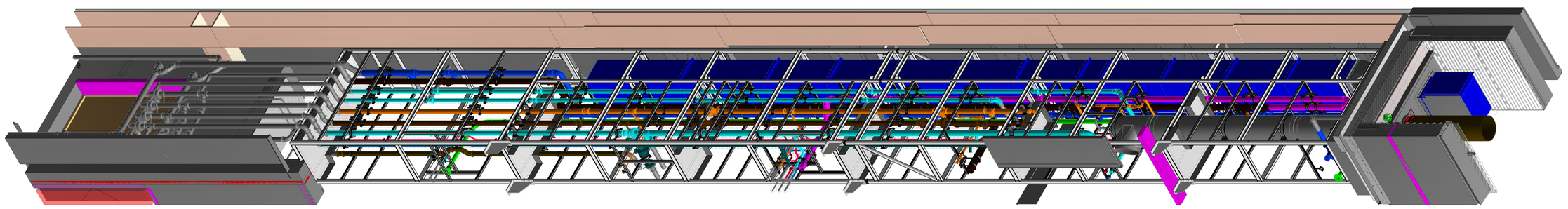
IV - ISOLATION VALVE
GC - GAS ISOLATION VALVE
SV - SOLENOID VALVE
PRV - PRESSURE REDUCING VALVE
DPCV - DIFFERENTIAL PRESSURE CONTROL VALVE
DRV - DOUBLE REGULATING VALVE
TMV - THERMAL MIXING VALVE
NRV - NON RETURN VALVE
CV - CIRCULATION VALVE
CS - COMMISSIONING STATION
CCBV - COMBO CONTROL BALANCING VALVE (PICV)
AAV - AUTOMATIC AIR VALVE
STR - STRAINER
MS - METER STATION
TP - TEST POINT
WM - WATER METER
DC - DRAIN COCK
WC - TOILET
WHB - WASH HAND BASIN
FD - FIRE DAMPER
SD - SMOKE DAMPER
AP - ACCESS PANEL
RE - RODDING EYE

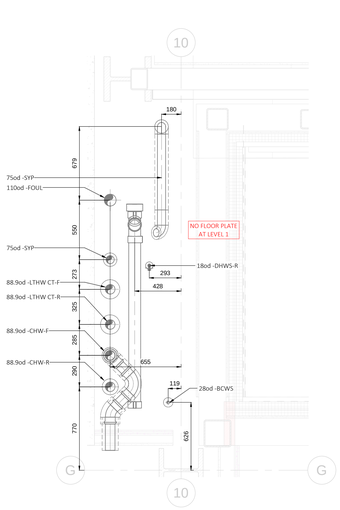
GREYED OUT SERVICES ARE NOT INSTALLED / PROVIDED AS PART OF THE MODULE AND ARE TO BE SUPPLIED AND INSTALLED BY THE MECHANICAL / ELECTRICAL CONTRACTOR.

WH S MECH RISER - ISO NW

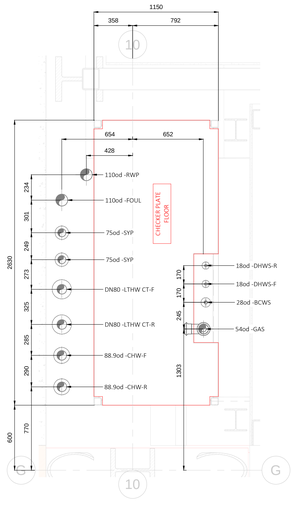


WH S MECH RISER - ISO NE

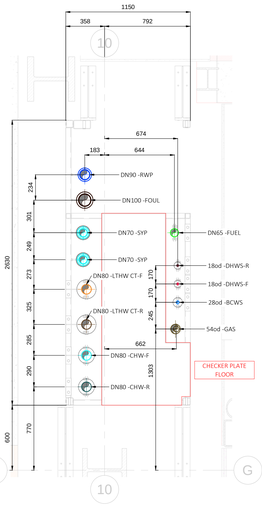




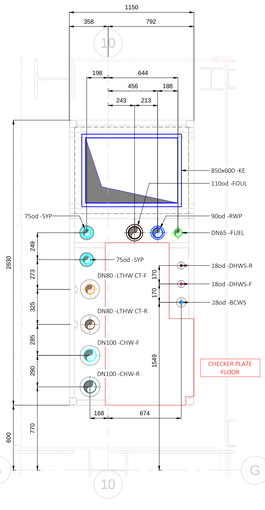
L01 WH S MECH RISER - FLOOR PLATE
Scale: 1 : 20



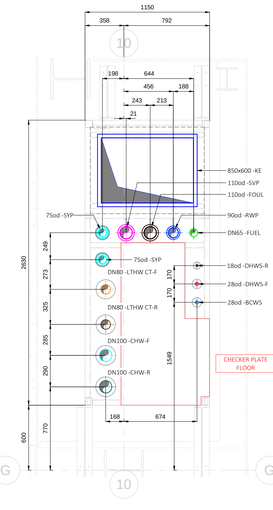
L02 WH S MECH RISER - FLOOR PLATE
Scale: 1 : 20



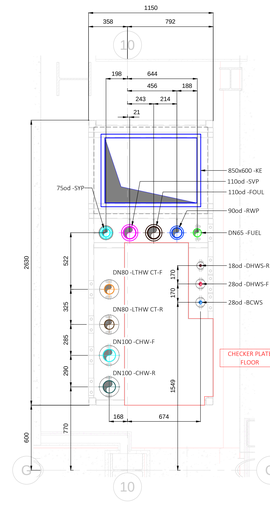
L03 WH S MECH RISER - FLOOR PLATE
Scale: 1 : 20



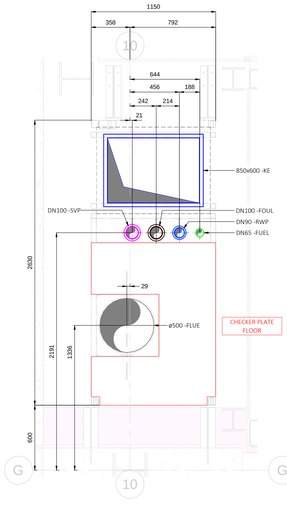
L04 WH S MECH RISER - FLOOR PLATE
Scale: 1 : 20



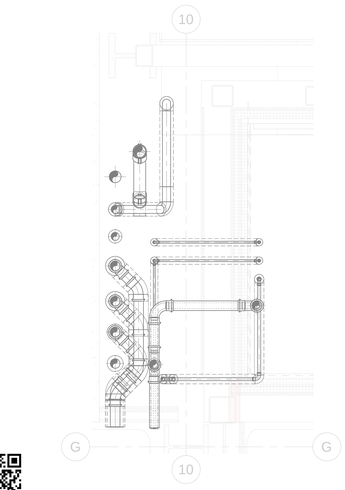
L05 WH S MECH RISER - FLOOR PLATE
Scale: 1 : 20



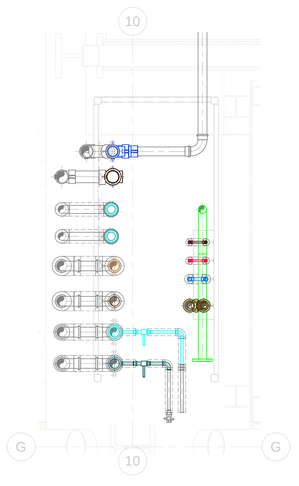
L06 WH S MECH RISER - FLOOR PLATE
Scale: 1 : 20



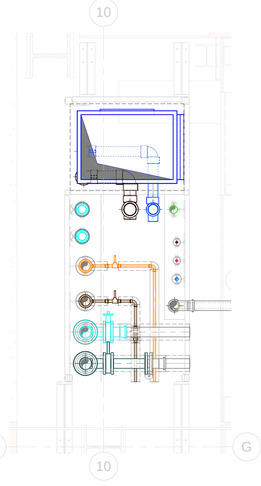
L07 WH S MECH RISER - FLOOR PLATE
Scale: 1 : 20



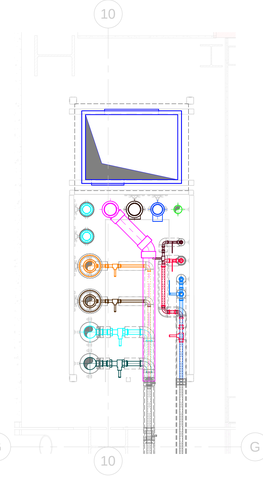
L01 WH S MECH RISER COORDINATED LAYOUT
Scale: 1 : 20



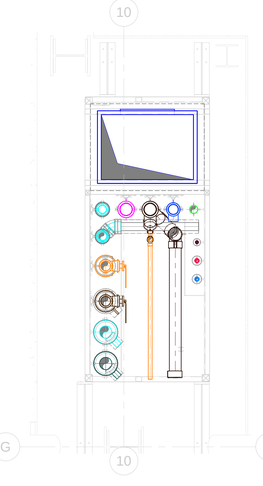
L02 WH S MECH RISER COORDINATED LAYOUT
Scale: 1 : 20



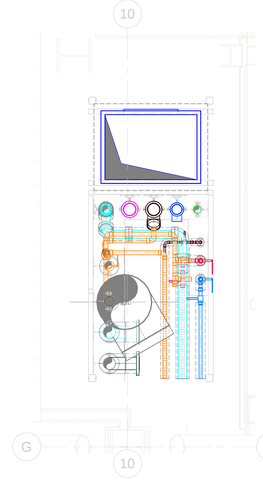
L03 WH S MECH RISER COORDINATED LAYOUT
Scale: 1 : 20



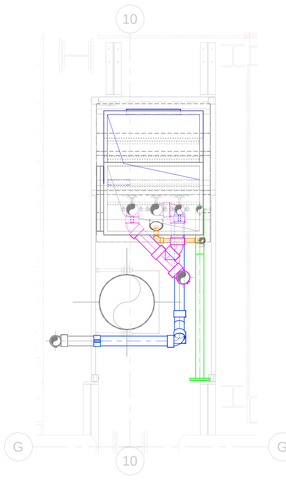
L04 WH S MECH RISER COORDINATED LAYOUT
Scale: 1 : 20



L05 WH S MECH RISER COORDINATED LAYOUT
Scale: 1 : 20



L06 WH S MECH RISER COORDINATED LAYOUT
Scale: 1 : 20



L07 WH S MECH RISER COORDINATED LAYOUT
Scale: 1 : 20

Rev	Date	Revision	Chk	Drn
C05	26/04/21	Issued for Construction. LTHW size change to 88.9 from DN100 as per schematic C09	DAC	MDY
C04	12/04/21	Issued for Construction. OMA architecture replaced by Ryder architecture, branches coordinated to avoid Ryder steel fire cladding, inline trap added under boiler flue, KE entry point raised to suit plantdeck height.	DAC	MDY
C03	17/11/20	Issued for Construction. Frame width dimension 2630 increased (was 2621) to suit increase in vertical box section to 70sq. (was 50)	DAC	MDY
C02	20/10/20	Issued for Construction, CHW branches added at L2, Boiler flue removed from prefab, KE duct size changed and joints added, Surge arrestors added, Top of riser bypass removed, Inline traps / tundishes added, Brackets and anchors finalised, Frame strengthened (t.b.c.)	DAC	MDY
C01	14/07/20	Issued for Construction	DAC	MDY
P01	19/03/20	Issued for External Approval	DAC	MY

Status:
S4 FOR CONSTRUCTION APPROVAL

Project:
THE FACTORY

MANCHESTER

Drawing Title:
WAREHOUSE TOWER RISER MECH 02
(Sheet 2 of 2)

MANCHESTER CITY COUNCIL
Albert Square, Town Hall,
M2 5DB, Manchester
United Kingdom
T +44 (0) 161 234 5004

Architect:
OMA
Heer Bokelweg 149
3032 AD Rotterdam, Netherlands
T +44 (0) 10 2438200

Consulting Engineer:
BDP.
11 Ducie Street
M1 2JB Manchester United Kingdom
T +44 (0) 161 828 2200

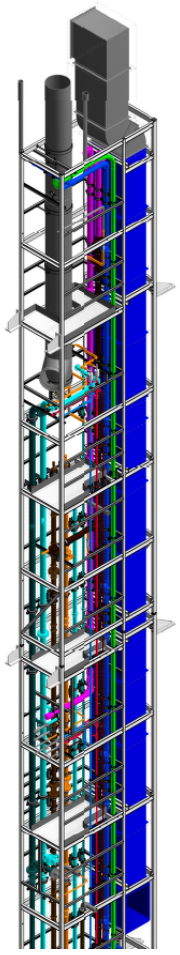
Leeds Office
Second Floor
3150 Century Way
Thorpe Park, Leeds
LS15 8ZB, United Kingdom
T +44 (0) 1777 356075
www.crownhouse.com

Crown House

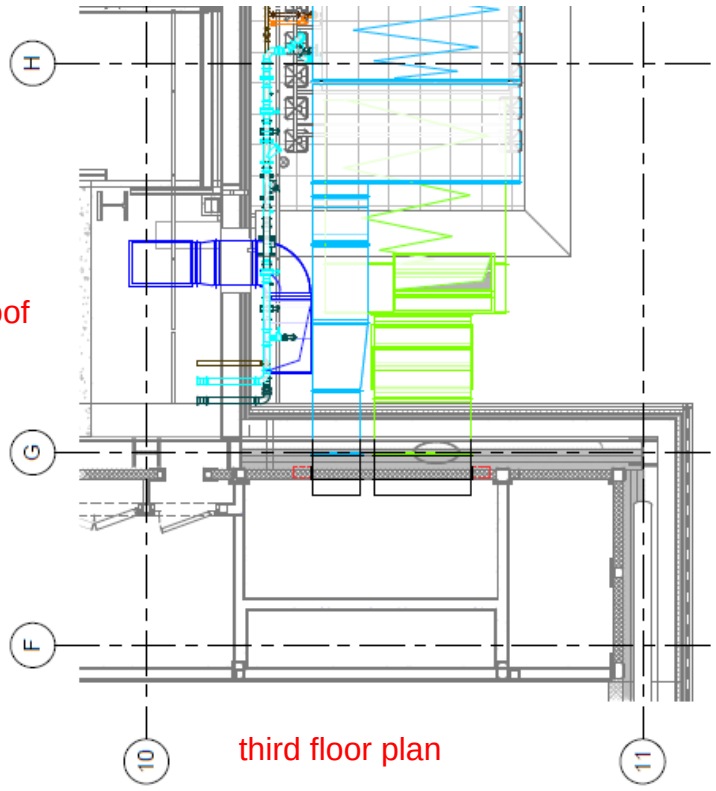
LAING O'ROURKE

Project:	N3844	Coordinated:	MY
Scale:	As indicated	Detailed:	MY
Original Drawing Size	A0	Checked:	DAC
		Approved:	JB
		Date:	10/03/20

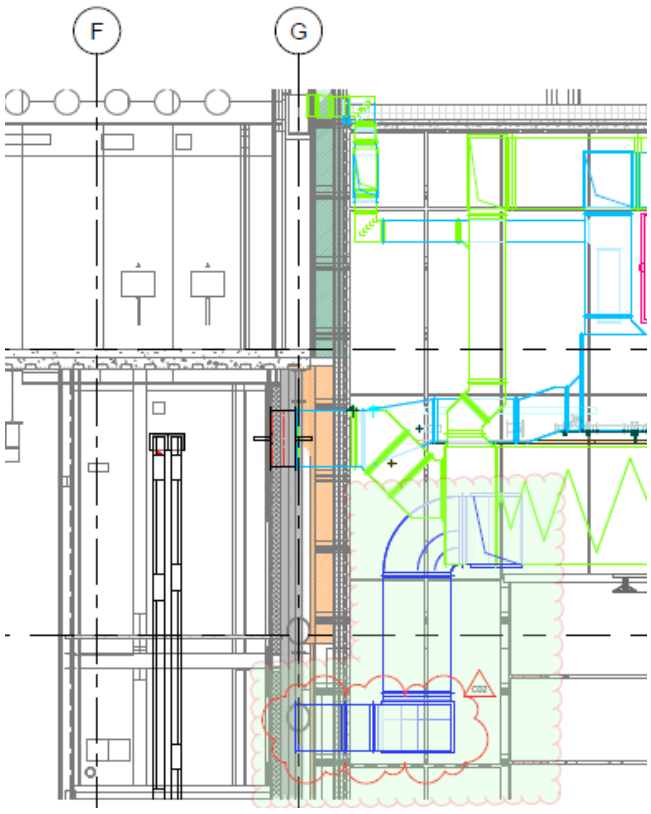
Drawing Number: MF-CHT-WH-XX-DR-M-50-0201
Rev: C05



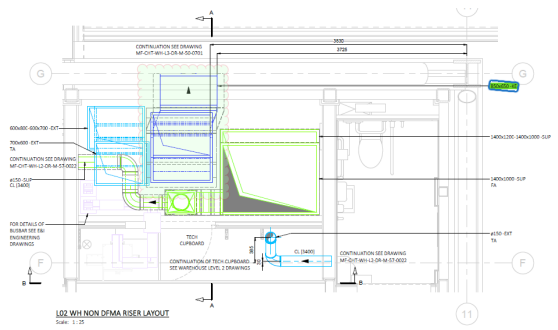
main riser 3rd floor to roof



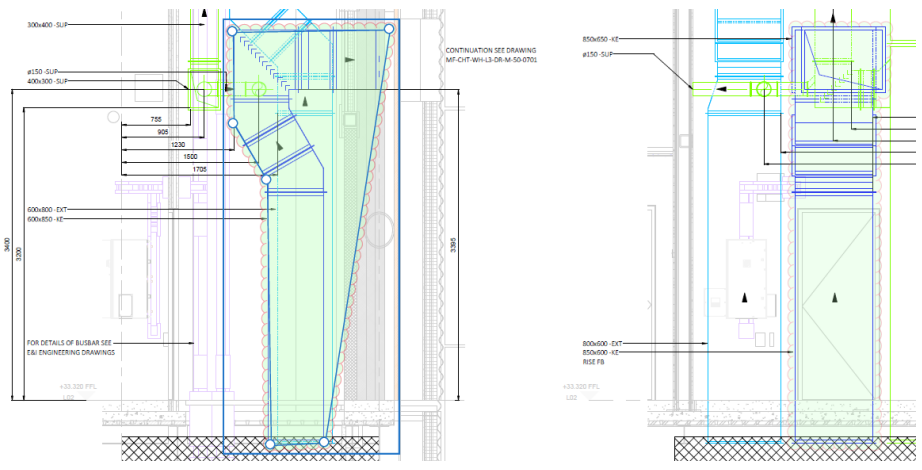
third floor plan



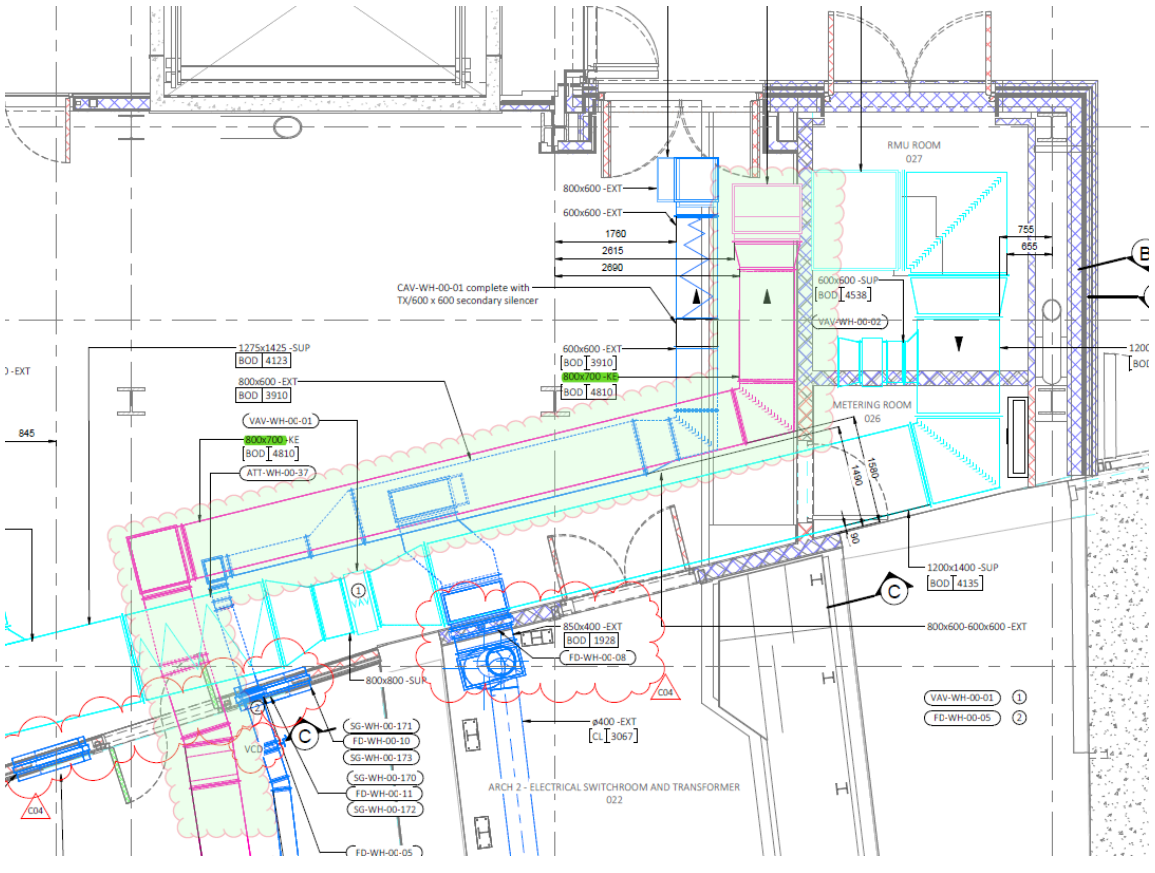
elevation 2nd floor to 3rd floor roof deck
and into main riser



second floor plan



riser ground to 2nd floor



ground floor plan

Attenuator Schedule

The Factory Manchester Kitchen Extract

Schedule Date
17/05/2023

Caice Reference
124796/Q00004

Notes

1. All products shall be supplied by Caice or equal and approved, as per their file reference 124796, contact Frazer Robinson on frazer.robinson@caice.co.uk or call 07585 441669.
2. The Contractor shall order the attenuators scheduled below, and shall send finalised drawings and equipment noise levels to the attenuator supplier to check the selections prior to manufacture.
3. The attenuator supplier shall then undertake acoustic calculations to ensure that the attenuators achieve the specified noise criteria, based upon the finalised information.
4. A Technical Submittal comprising acoustic calculations and a finalised schedule of attenuators shall then be issued to the Consultant for final approval.
5. If an alternative attenuator supplier is proposed then the Contractor shall allow for them to undertake witnessed tests to prove their claimed insertion loss performance in a UKAS accredited BS EN ISO 7235: 2009 test facility, for two sample units. This shall be undertaken prior to order.
6. Pressure losses are stated in accordance with ISO 7235, which is based on laminar airflow conditions. The system designer shall make allowance for increased attenuator pressure losses where turbulent airflow conditions exist on the attenuator entry or exit.
7. Unless stated otherwise all attenuators shall be constructed as follows: Galvanised sheet steel casings with 30mm profile flanges that are fully compliant with DW/TM1 at a high pressure rating (+2000/-750Pa). Profile flanges shall be compatible with Doby, Mez & Metu flanging systems. Elements shall be installed in the vertical plane, with side elements provided as standard, and all elements shall have aerodynamic inlet and outlet fairings. Element facings shall be constructed from expanded galvanised steel mesh with fibre glass tissue bonded to the inner face. Mineral wool infill shall be overpacked to minimise voids due to settlement. Attenuator ends shall be protectively wrapped, and all attenuators shall be delivered to site on pallets and individually labelled.

Product Reference	Product Description	Product Code	Dimensions (mm) Width	Height	Length	Volume (m³/s)	Pressure Loss (Pa)	Quantity	Noise Criteria	Features
AT001-1	KEF-WH-08-01 Exhaust	Rectangular SG01H/3C/L/SM	900	925	1200	3.60	54	1	60dB(A) at 5m	Rectangular attenuator & Horizontal elements
AT001-2	KEF-WH-08-01 Exhaust	Rectangular SG01V/3C/L/SM	925	875	900	3.60	58	1	60dB(A) at 5m	Rectangular attenuator
AT001-3	KEF-WH-08-01 Exhaust	Circular CG01P/2L/L/M	630	dia	1500	3.60	41	1	60dB(A) at 5m	Circular attenuator, Fitted with central pod, End rings with pattern A drillings & Medium pressure rating (+1000/-750Pa)
AT001-4	KEF-WH-08-01 Exhaust	Circular CG01P/2M/L/M	800	dia	1600	3.60	22	2	60dB(A) at 5m	Circular attenuator, Fitted with central pod, End rings with pattern B drillings & Medium pressure rating (+1000/-750Pa)
AT002-1	KEF-WH-08-01 Exhaust	Rectangular SG01H/3C/L/SM	1400	1025	1200	8.60	54	1	55dB(A) at 1.5m	Rectangular attenuator & Horizontal elements

Document Package 124796/99/1/5
Direct Telephone 01756 708765
Direct E-Mail sarah.waudby@caice.co.uk

Attenuator Schedule

The Factory Manchester Kitchen Extract

Schedule Date
17/05/2023

Caice Reference
124796/Q00004

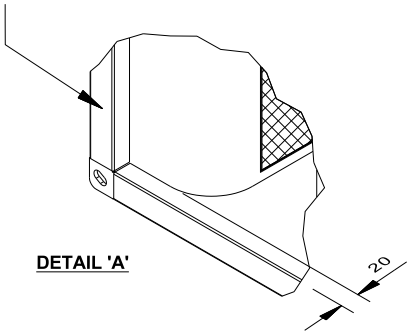
Product Reference	Product Description	Product Code	Dimensions (mm) Width	Height	Length	Volume (m³/s)	Pressure Loss (Pa)	Quantity	Noise Criteria	Features
~~AT002-2~~	~~KEF-WH-08-01 Extract~~	~~Rectangular SG01V/3C/L/SM~~	~~1250~~	~~150~~	~~1200~~	~~1.20~~	~~54~~	~~3~~	~~55dB(A) at 1.5m~~	~~Rectangular attenuator~~
AT002-3	KEF-WH-08-01 Extract	Rectangular SG01V/2C/L/SM	1250	1735	1200	3.60	33	1	55dB(A) at 1.5m	Rectangular attenuator & Medium pressure rating (+ 1000/-750Pa)

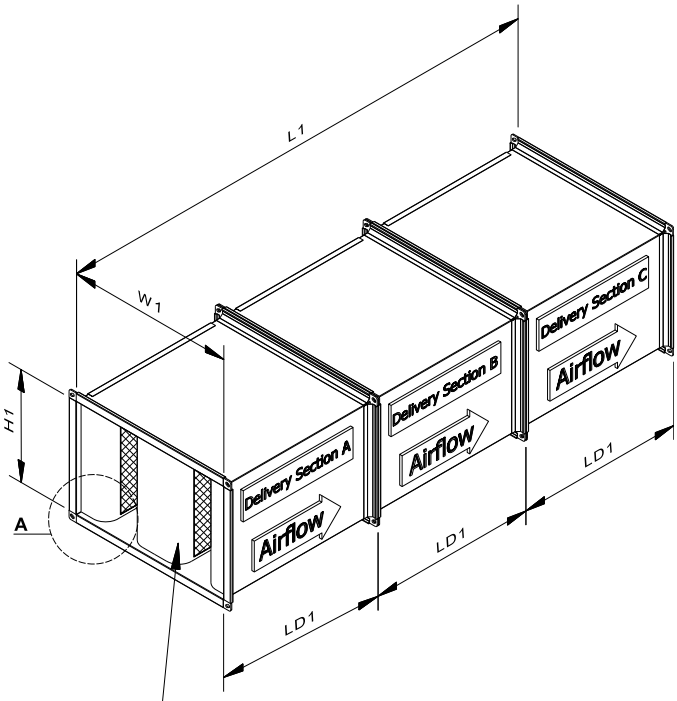
Direct Telephone 01756 708765
Direct E-Mail sarah.waudby@caice.co.uk

SG Splitter Attenuator with Profile Flanges

The Factory Manchester Kitchen Extract (124796/Q00004)

Profile flanges suitable for MEZ, DOBY or METU flanging systems. See table for flange size.





Splitter elements set back in casing by 20mm and provided with aerodynamic bullnoses on inlet and outlet as shown. However if item has non-standard elements refer to Attenuator Product Code Definitions for details.

Splitter elements shown installed in the verical plane. Refer to item Product Code for actual orientation.

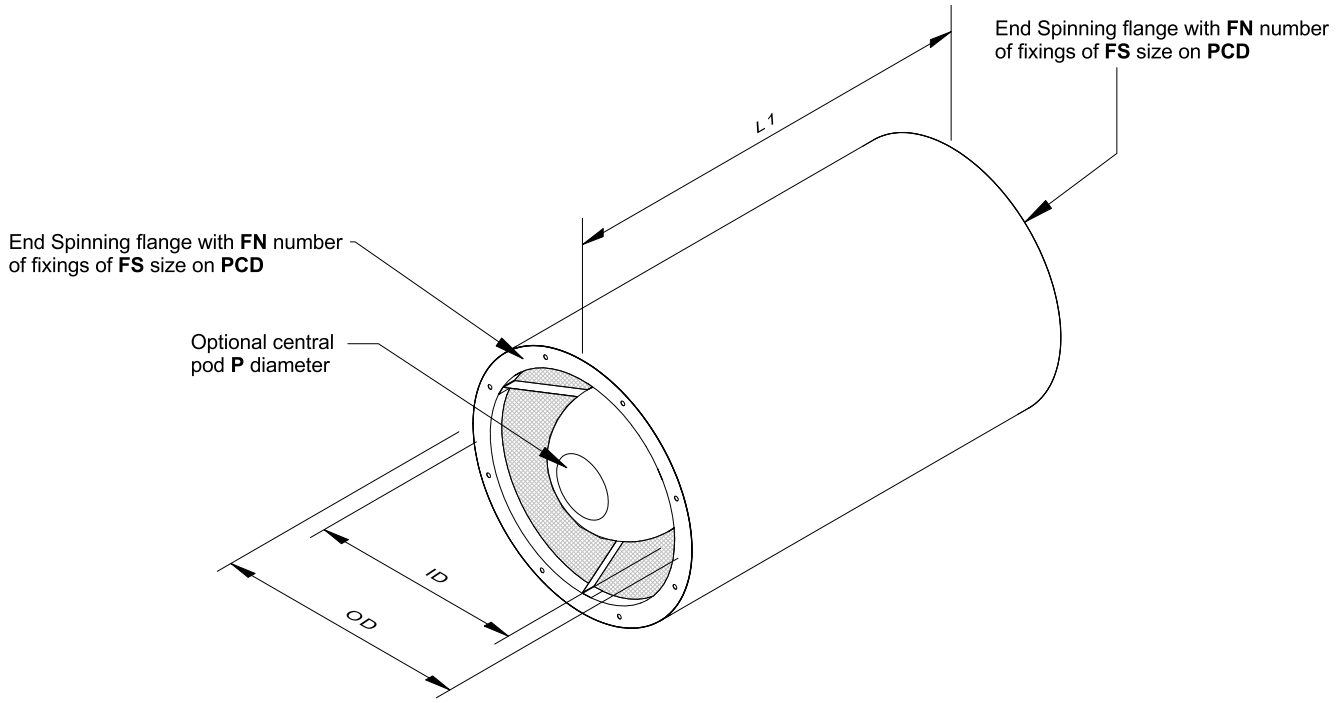
Notes

- Assembly of multiple piece items must be in accordance with the delivery section and airflow label layouts, typically as shown opposite. Assembly by others.
- Where LD1 exceeds 1250 each delivery section has an intermediate central flange.
- See NDL in table below for number of delivery sections in length per item.
- Nuts, bolts, flange clamps and gasket between flanges by others.
- Tolerances on W1 & H1 +/- 2mm.
- All dimensions in mm.
- Identification labels stating Product Reference and Description provided on all delivery sections.
- Attenuators may be delivered in 1, 2, 3 or 4 sections in length (3 shown).
- Delivery section and airflow labels only provided on multiple piece items.
- W1 and H1 dimensions are inside case.
- Tolerances on LD1 +/- 3mm.

Product Reference	Product Code	Primary Dimensions			Delivery Data		Flange Size (mm)	Paint Colour	Weight (kg)	Qty
		W1	H1	L1	LD1	NDL				
AT001-1	SG01H/3C/L/SM	900	925	1200	1200	1	30	(Not painted)	108	1
AT001-2	SG01V/3C/L/SM	925	875	900	900	1	30	(Not painted)	85	1
AT002-1	SG01H/2C/L/SM	1400	1025	1200	1200	1	30	(Not painted)	151	1
AT002-2	SG01V/3C/L/SM	1250	450	1200	1200	1	30	(Not painted)	100	3
AT002-3	SG01V/2C/L/SM	1250	1735	1200	1200	1	30	(Not painted)	227	1

CG Circular Attenuator with Spiral Wound or Plain Galvanised Sheet Steel Casing & End Rings

The Factory Manchester Kitchen Extract (124796/Q00004)



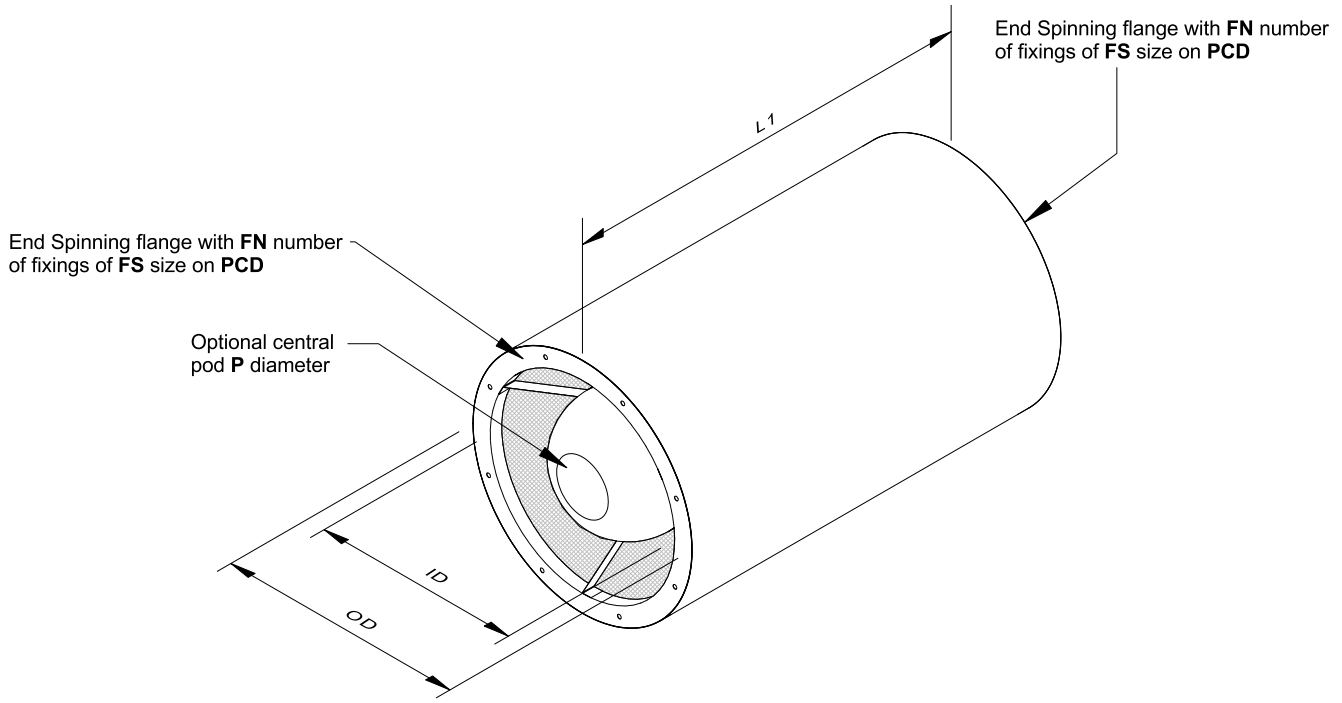
Notes

- Identification labels stating Product Reference and Description to be provided on all items.
- Tolerance on L1 +/- 2mm.
- All dimensions in mm.
- Casings may be either plain or spiral wound.
- Tolerance on ID +/- 2mm.

Product Reference	Product Code	Primary Dims			Other Data				Paint Colour	Weight (kg)	Qty
		ID	OD	L1	FN	FS	PCD	P			
A1001-3	CG01P72L/L/M	630	805	1500	12	M10	690	320	(Not painted)	81	1

CG Circular Attenuator with Spiral Wound or Plain Galvanised Sheet Steel Casing & End Rings

The Factory Manchester Kitchen Extract (124796/Q00004)



Notes

- Identification labels stating Product Reference and Description to be provided on all items.
- Tolerance on L1 +/- 2mm.
- All dimensions in mm.
- Casings may be either plain or spiral wound.
- Tolerance on ID +/- 2mm.

Product Reference	Product Code	Primary Dims			Other Data				Paint Colour	Weight (kg)	Qty
		ID	OD	L1	FN	FS	PCD	P			
AT001-4	CG01P/2M/L/M	800	1005	1600	24	M10	837	405	(Not painted)	108	2

Terms & Conditions
Supply Only

Definitions

"The Company" means CAICE ACOUSTIC AIR MOVEMENT LTD.
"The Customer" means the giver of the Purchase Order the acceptance of which by the Company subject to the terms and conditions herein contained gives rise to this contract.
"The goods" means the product, products, or other articles and services specified in the Purchase Order.
“The Order Value” means the sum on the Purchase Order Acknowledgement related to the Purchase Order accepted by the Company.
“Standard Delivery Service” means a single delivery, with no allowance for any constraints or special conditions, made on a 45 foot articulated vehicle using a curtain-side trailer (typical load capacity of 26 pallets or equivalent pallet spaces).
“Standard Delivery Timing” means any weekday during the hours of 08:00 to 16:00.
“Normal Working Hours” means any weekday during the hours of 08:00 to 17:00.
“Standard Pallet” means Wooden Pallet 1200mm x 1000mm.
“Special Delivery Service” means non standard delivery service detailed in section 3(k).
“MOFFETT” means vehicle with truck mounted forklift.
“HIAB” means vehicle with loader crane.
“Tail-Lift” means a mechanical device permanently installed on the rear of a vehicle designed to facilitate the materials handling of goods from ground level or a loading dock to the level of the vehicle bed, or vice versa.
“FORS” means Fleet Operator Recognition Scheme FORS - Aligned to other schemes. Click for more details.
“External Suppliers” Suppliers of materials supplied to Caice for the execution of the works.

Contract Terms

(a) All Purchase Orders accepted shall be undertaken in accordance with and subject to the terms and conditions contained herein.

(b) All contracts shall be deemed to be on a Supply Only basis.

(c) All additions to or variations of these terms and conditions whether or not contained in any document provided by the Customer or its Agent shall be inapplicable unless specifically accepted in writing by an authorised representative at director level of the Company.

Delivery and Risk

(a) Any time or date named for delivery by the Company is an estimate only, and although the Company will use its best endeavors to comply with delivery dates the Company shall not under any circumstances be liable for the consequences of any delay and the customer shall not be entitled to repudiate or cancel the contract as a result of such delay. The Company reserves the right to withdraw or suspend delivery of any goods ordered if compelled to do so by any cause outside its control.

(b) Where goods have been manufactured to an agreed programme and the site is unable to accept delivery the Company reserves the right to charge for the vehicle cancellation charges and the storage costs incurred. Before a shipment on a revised date the Company would require a purchase order or official instruction to cover any costs incurred. The Company require a minimum of 6 full working days notice prior to the originally agreed delivery date for consignments being delivered during normal working hours to mainland England and Wales. Consignments being delivered outside of this geographical area require a minimum of 8 full working days.

(c) Unless the Customer shall otherwise nominate delivery shall be considered to have taken place when the goods are delivered by or on behalf of the Company to the Customer at which time risk in the goods shall pass to the Customer. If the Customer should nominate a carrier delivery shall be considered to have taken place upon the goods being delivered to the nominated carrier.

(d) Unless otherwise stated delivery will be by our Standard Delivery Service. Delivery vehicles are not fitted with tail-lifts. Smaller consignments (up to 4 pallet spaces) may be sent on a pallet network service (Palletline or similar) at the discretion of The Company.

(e) Unless otherwise stated delivery will be on our Standard Delivery Timing. The Company will advise the Customer of the intended date of delivery by issuing a delivery advice note, usually with 2 -3 working days notice.

(f) Dependant on size, the goods may be delivered in boxes/cartons/on pallets or directly onto the vehicle.

(g) Shortage or damage to goods must be notified by the Customer in writing, within 48 hours of the delivery date to the Company, otherwise no claim can be considered.

(h) Unless otherwise stated the Customer is responsible for the cost and attendance required for offloading, storing, distribution and hoisting of the goods to our work area and must ensure that suitable facilities exist at the delivery destination for safe handling of the goods with consideration to size, weight etc. Where appropriate a forklift truck is recommended. Where a crane is used for offloading, suitable equipment such as load bars, spreader bars etc. must be used to negate lateral loads and to prevent damage to pallets or the goods thereon. Pallets will not be supplied pre-stropped. The Company must be advised and notified by the Customer of a pallatised specification that varies from Standard Pallets.

(i) A maximum of 1 hour waiting time is allowed in the delivery of goods, beyond which time deliveries will be withdrawn from site and any additional costs incurred will be borne by the Customer. No waiting time is allowed for deliveries using pallet network service, should waiting time occur then deliveries will be withdrawn and any additional costs incurred will be borne by the Customer.

(j) Unless otherwise stated, the Customer is liable for the cost and provision of any temporary closure of a public road or use of adjacent public land required to facilitate the delivery of goods, all arrangements to be made by the Customer.
(k) The following Special Delivery Services are available on request at additional cost:
- Multiple, split deliveries to accommodate site programme and/or available site storage
- Delivery vehicles Specifics : vehicles with FORS certification, non-articulated vehicles (24 foot rigid curtainsider : typical load capacity of 12 pallets or equivalent pallet spaces) Tail-Lift, MOFFETT or HIAB equipped vehicles, small delivery vehicles.
- The Company will need to be advised by the Customer of alternative vehicle scheme requirements and site specific requirements for packing and deliveries. This will all be reviewed and costed on a site by site/project by project basis.
- Delivery timing specifics : specific day/multiple delivery dates/a.m or p.m. deliveries, or specific time slots/delivery out of normal working hours stated above, at weekends, or on Public/Bank Holidays/Security clearance deliveries where driver and/or vehicle details are required.
- Packaging and Loading Specifics : Packing of equipment in specific batches or grouping/Loading of equipment on vehicle in a specific order, provison of pallets suitable for cranage.

Insurance

Save where the goods are delivered to the Customer's nominated carrier the goods will be insured by the Company from the date of dispatch until delivery, or if being sent by post, until the acceptance at the Post Office, and proof of acceptance at the Post Office shall be by Post Office receipt. This condition shall not apply if the customer nominates the method of carriage.

Non-Delivery

The Company must be advised of non-delivery, items have not arrived at the the agreed destination within 48 hours of the date of delivery as shown on the Company's advice note.

Storage Charges

The Company reserves the right to charge for storage costs incurred should confirmed delivery dates be delayed.

- Per standard pallet 1000mm x 1200mm(or part) £5.00 per week or part thereof.
- Non-Standard pallet space will need to be confirmed on a project specfic basis.

Handling Charges in and out of storage

Should the Customer require goods to be stored, handling charges in and out of storage will be issued on an individual project basis.

Inspection

The Customer shall inspect the goods immediately on delivery thereof, and shall within 48 hours from such inspection give notice in writing to the Carrier and to the Company of any matter or thing by reason whereof the Customer alleges that the goods are not

in accordance with the Contract. If the Customer shall fail to give such notice the goods shall be deemed to be in all respects in accordance with the contract and the Customer shall be bound to accept and pay for the same accordingly.

Price

(a) The amount payable by the Customer to the Company is the Order Value, together with the reimbursement of any cost incurred by the Company arising from changes to the order requested by the Customer.

(b) Unless otherwise stated the Order Value is exclusive of Value Added Tax (VAT) and all other duties which may from time to time be levied.

(c) In accordance with HMRC regulations, all reduced rate VAT or Zero-rated VAT transactions will require the appropriate documentation to be provided by the Customer to substantiate the VAT liability, otherwise VAT will charged at the prevailing standard rate.

(d) Estimates and quotations indicate prices ruling at date of issue and are subject to review from date of issue.

Payment

(a) Until a credit account in the Customer's name has been approved in writing by the Company, invoices will be issued by the Company to the Customer on an 'immediate payment' basis, that is to say payment must be made by the Customer to the Company before manufacture or delivery of the goods by the Company. A payment structure must be agreed and in place on receipt of order and prior to any commencement of work, upfront payment will be required to balance any shorfall in credit cover. Any invoice raised will remain a tax invoice in respect of VAT.

b) In the event of cover on the Customer's credit account being revoked the Company reserves the right to revert to an 'immediate payment' basis.

(c) With the exception of upfront payment agreements, terms of payment will be 30 days from date of invoice unless otherwise stated in writing elsewhere.

(d) In the event of any default by the Customer in payment for the goods on the due date then the Company may without prejudice to any of its rights and remedies hereunder charge interest at the rate of 2% per month on any amount overdue for payment, and may suspend further deliveries to the Customer (with or without cancellation of the balance of the contract) under any contract between the Company and the Customer.

(e) When goods are manufactured to an agreed programme or date, should the Customer not be in a position to accept the goods the Company resrves the right to issue a vesting certificate and claim payment for the goods, the Company reserves the right to charge the Customer any additional costs associated with the vesting procedure including storage costs. Added premium of £25 will be charged per hard copy of Invoice / Application issued by post.

Warranties

(a) Unless otherwise agreed in writing, the standard warranty period for the goods is 12 months from the date of delivery.

(b) Any warranties whether standard or project specific, shall not cover any goods misused in any way while outside the control of the Company in respect of which defects have not been reported to the Company within the time stipulated.

(c) To the extent that all other warranties conditions and representations may in law be excluded they are hereby excluded, and no liability shall accrue to the Company in respect of any loss, damage or personal injury suffered (whether directly or consequentially) arising out of the supply or re-use of the goods or any defects therein save that the following shall not be excluded: -

i) any liability in respect of death or personal injury arising out of the Company's negligence; and

ii) such liability in respect of damage or loss arising directly out of the Company's negligence as it would in the circumstances be unreasonable to exclude.

(d) Notwithstanding the foregoing any liability of the Company as set out above shall (except with regard to liability in respect of death or personal injury as set out in sub-clause (b)(i) hereof) in all cases be limited to the invoice price of the goods in respect of which the Customer's claim is made.

Design Services

Where acoustic design consultancy services are provided on a fee-paying basis, such services will be covered under the Company's Professional Indemnity insurance. Where no such fee is payable it is the responsibility of the Customer to ensure the Company is provided with the final design drawings specifications and any associated equipment data to enable the Company to validate the suitability of its product proposals within their intended application.The Company will use its best endeavours to determine from the project specifications provided any special requirements such as fire ratings, usage in clinically clean or highly corrosive or aggressive environments, which may dictate an upgrade or upgrades to the Company's standard product constructional specifications. However, the Company will not be held responsible for any omission or error in this respect, and it is therefore the Customer's sole responsibility to specifically identify and advise any such need, and to check that the Company's specification details, which are provided for Customer's approval prior to manufacture, meet fully with Customer's requirements.

Projects that require upfront CAD and structural design work will be reviewed on a project by project basis and associated costs advised accordingly, should the Customer not proceed with placing an order on the Company to proceed into manufacture, based on the upfront design, the company has the right to absolve all resposibility for the design. All design drawings and calculations in hard copy must be returned or destroyed, all soft copies must be deleted. The design and calculations must not be passed to a third party.

Quotations inclusive of products that are finish painted with PPC (Polyester Powder Coating) are to an 'Unspecified Standard RAL colour paint' with a Gloss Level of 25% + / - 5% band category 'A' from the relevant product seletor, PPC thickness 48 µm. Alternative band categories and increased paint thickness will be charged extra as required and can be be selected from the 'Specified' section of the product selector under 'Premium' & 'Premium Plus'. All painting of The Companys products is carried out under the Companys Standard Operating Procedure & Paint Test Standard Operating Procedure. **Please refer to Caice** Polyester Paint Colours.

Goods with CE Certification

Any change to design of goods supplied by the company with CE certification will automatically become void, making the certifiication invalid.

Title to Goods

(a) Legal title to and property in the goods shall remain with the Company and shall not pass to the Customer until payment has been made in full by the Customer for such goods.

(b) During the time prior to passing of legal title in the goods the Customer shall act as bailee for the Company in respect of the goods and shall mark them as the property of the Company, store them separately from the Customer's own goods and if required to do so shall undertake to return them to the Company. If the customer should sell the goods prior to the passing of title pursuant to the terms of this clause then the Customer shall be bound as a fiduciary to preserve and keep separate the monies arising on such sale.

(c) The Company reserves to itself the right to enter upon any premises, without notice, of the Customer or its nominated carrier where the goods are stored prior to passing of legal title to the Customer, for the purposes of inspecting the goods and of re-taking possession of the same.

Waiver

Any failure by the Company to enforce or require strict performance by the Customer of any of the Terms or Conditions contained herein shall not constitute a waiver thereof by the Company nor affect or prejudice the rights of the Company in any way in respect of the remedies open to the Company for any breach of the terms hereof.

Termination of Contract

(a) If the Customer shall make default in or commit a breach of the Terms and Conditions herein contained or of any other of his obligations to the Company or if any distress or execution shall be levied upon the Customer's property or assets or if the Customer shall make or offer to make any arrangement or composition with creditors or commit any act of bankruptcy or if any Petition or Receiving Order in Bankruptcy shall be presented or made against him or if the Customer is a limited Company and any Resolution or Petition to Wind up such Company's business (other than for the purpose of amalgamation or reconstruction) shall be passed or presented or if an Administrative Receiver of such Company's undertaking property or assets or any part thereof shall be appointed the Company shall have the right forthwith to determine any contract then subsisting and upon written notice of such determination being posted to the Customer's last known address any subsisting contracts shall be deemed to have been determined without prejudice to any claim or right the Company may otherwise make or exercise.

(b) If the contract is terminated all reasonable, direct and actual costs incurred will be reimbursable by the Customer to the Company.

Force Majeure

(a) In the event of an outbreak of hostilities (whether war is declared or not)in which the United Kingdom is involved or in the event of a national emergency or if the Company should become either directly or indirectly so engaged on government orders or orders under priority directions as to prevent or delay the fulfilment of other orders the Company shall be entitled at any time on notice to the Customer to make partial deliveries only or to determine the contract without prejudice in any case to rights accrued in respect of deliveries already made.

(b) Delivery may be wholly or partially suspended and no liabilities shall accrue to the Company therefore in the event of a stoppage delay or interruption of work in the establishment of either the Company or of any supplier during the delivery period as a result of strike lockouts, trade disputes, breakdown, accident, storm, flood, fire or failure of third parties to deliver the goods or provide services connected therewith or any cause whatsoever beyond the control of the Company which has the effect of preventing the Company from carrying out its obligations to the Customer hereunder.

Dispute & Resolution

If any disputes or differences arise between the parties under this agreement, the parties shall within 60 days of a written request from either party to the other meet through duly authorised representatives in an effort to resolve the dispute in good faith. Pending the conclusion of such a meeting the parties agree they shall not seek to pursue any other dispute resolution proceedings.

Weights Measures and Illustrations

Whilst every care has been taken to make the information complete and accurate, weights and measurements given in the Company's leaflets, catalogues, price lists or other trade literature should be taken as approximate only and subject to alterations of which the Company cannot undertake to give prior notice. Illustrations are given as a general guide and are not necessarily accurate in detail.

Data Protection Act

Where the Customer provides us with personal data, the data will be held securely in confidence and processed for the purpose of carrying out trading activities with the Company. The Customer accepts that we may consult with and disclose the data to credit reference agencies, banks, credit insurers and other responsible organisations outside our business and that we have nominated, and that such third parties may process the data. The Customer understands that under the Act they have a right to know what data is held on them and if they apply to us in writing and pay the applicable fee. Please refer to our Privacy and cookies policy

Law Applicable

These Terms and Conditions and any contract between the Customer and the Company are governed by English Law and the English Courts alone shall have exclusive jurisdiction.

Notices

Any Notice in writing hereunder shall be deemed to be received two days after posting to either the Registered Office or the last known trading address of the recipient

Discharge West over warehouse roof

ATT

Bifurcated kitchen extract fan

ATT

Triple stacked ESP i 4500 electrostatic precipitators

ESP1

ESP2

ESP3

WAREHOUSE ROOF

TOWER ROOF

Cleaning access panel

Cleaning access panel

Cleaning access panel

Cleaning access panel

Cleaning access panel

Riser level 03 to roof,

External fire rated duct between risers accessed from external MEWP

Cleaning access panel

Cleaning access panel

Cleaning access panel

Riser HL ground to mid level 03

Cleaning access panel

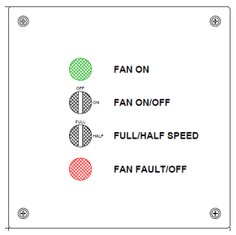
UV

In-line UV ozone injection system

Extract canopy with baffle filters and fire suppression

KITCHEN

100% INDIRECT MECHANICALLY VENTILATED MAKE-UP AIR VIA BUFFER STORE



Two speed fan control
- half speed 1.8m^3/s
- full speed 3.6 m^3/s

NOTES

1. Equipment on roof accessed from stair 3 of the tower that extends all the way to the towers roof. Final route to extract equipment is up the steps to the main roof, along the main roof footway and then down a set of steps to the extract equipment.

2. full running is 3.6m3/s

3. half speed is 1.8m3/s

4. ESP units are enabled when the fan is running and disabled when the fan is stopped.

KITCHEN EXTRACT SCHEMATIC
ARCH 3 - MIF FACTORY

FACTORY INTERNATIONAL
FOYER COFFEE SHOP AND BAR FOOD MENU **SUBJECT TO CHANGE**

We are committed to working with and championing local suppliers from Manchester and the surrounding regions, whilst reducing our impact on the environment. Our menu therefore may change from time to time based upon seasonality and ingredient availability.

1. BAR AND BAKERY COUNTER

BREAKFAST GRAB AND GO SERVED **8AM-3PM**

SIOP SHOP DOUGHNUTS
PASTRIES AND BAKES FROM **HALF DOZEN OTHER BAKERY**
CROISSANT **(V)** / PAIN AU CHOCOLAT **(V)** / PAIN AU RAISIN **(V)**
CINNAMON BUN **(V)** / SEASONAL DANISH **(V)**
PISTACHIO AND WHITE CHOCOLATE CROISSANT **(V)**
TAHINI BANANA BREAD **(VG, GF)**
ECCLES CAKE (V)
SALTED CARAMEL BROWNIE **(VG)**

FOCACCIA SANDWICHES **FROM MIDDAY**

Fresh focaccia sandwiches made daily by our team of in-house chefs, using locally baked bubbly focaccia. Our pickles and ferments come from local Plucky Pickle.
Examples include but regularly changing -

HAM & PLUCKY PICKLE - Honey Roast Ham, Manchester Plucky Pickle Giardiniera
CORONATION CAULI - Curried Cauliflower, Crunchy Lettuce, Toasted Almonds (VG)
MANC HERO - British mozzarella, Rocket Pesto, Northern Cure Salami, Manchester Pickles
BHAJI BUTTY - Onion Bhaji, Shredded Lettuce, Date and Mango Chutney, Coconut Yoghurt (VG)
CHEESE & ONION - Lancashire Cheese, Onion, Beetroot Pickle
CHICKEN KATSU - Free range chicken schnitzel, white cabbage slaw, curry mayo

QUICHE OF THE DAY

Made daily in house, using seasonal and locally sourced fillings, and served with selection of two salads. One on offer each day. Example choices -

COURGETTE, PEA AND MINT (VG) / BLACK GARLIC, CHARD AND LANCASHIRE CHEESE (V) / FREE RANGE CHICKEN, LEEK AND 'NDUJA

SALADS

We use only sustainably grown salad leaves and herbs in our salads, sourced from local Lancashire farms. 3 salads available at any one time - choices may include

GRILLED CHICKEN SUPERGREENS (GF) - free range chicken, supergrains and greens, broccoli, cherry tomatoes, green goddess dressing, pickled onions

CRISPY CHICKPEA CAESAR (VG, GF) - Romaine and shredded kale, crispy roast chickpeas, pickled red onion, caesar dressing

CHICKEN CAESAR - Romaine and shredded kale, shredded chicken thigh, pickled red onion, parmesan, caesar dressing, pitta chips

PLANT POWER (V, GF) - Romaine and shredded kale, chickpeas, roasted beets, pumpkin seeds, pickled onions, green tahini dressing

GREEN FALAFEL (VG) Mint tabbouleh, cucumber, roast veg, houmous, watercress, tahini dressing

PROTEIN BOWL (GF) - Romaine and kale, baby spinach, roast chicken, farm egg, pickled onions, walnuts, feta

GOATS CHEESE (GF) - roast sweet potato, shredded kale, pecans, chilli honey dressing

TOFU POKE BOWL (GF,GF) - avocado, wild rice, edamame, sriracha mayo, pickled ginger, crispy onions

GREEK CRUNCH (V) - feta, olives, red onion, cucumber, tomatoes, rocket, oregano**,** crunchy pitta chips

SOUP

changing daily, made from zero waste vegetable stocks, served with house made flatbread or gluten free bread, example choices -

LENTIL DAAL - garlic dill raita, toasted pumpkin seeds **(VG, GFO)**

BROCCOLI AND BLUE CHEESE - Broccoli and Nicky Nook, crispy onions **(V, GFO)**

THAI SPICED MULLIGATAWNY - Coconut and Lime Sambal **(VG, GFO)**

PIZZA ROMANA **All day 12 - 10pm**

BY THE SLICE

Crisp, light, double fermented dough, made in house.
We're excited to be working with *Wildfarmed* regeneratively farmed British flour, which has a negative carbon footprint. Our cheeses and meats are sourced locally.

MARGHERITA - British mozzarella, tomato sauce, fresh basil, olive oil **(V)**

FUNGHI - British mozzarella, tomato sauce, mushrooms, basil, olive oil **(V)**

NORTHERN CURE - Tomato, mozzarella, 'Northern Cure' Manchester made fennel salami, 'nduja and pickled chillies

BLUE CHEESE AND BROCCOLI - Tenderstem broccoli, 'Nicky Nook' blue cheese, walnut gremolata, chilli oil (No Tomato)

BURRATA AND BLACK PUDDING - Bury black pudding, mozzarella, crispy sage, burrata, chilli honey

VEGAN CHORIZO AND PINEAPPLE - 'Symplicity' vegan chorizo, pickled pineapple, vegan mozzarella, red onion (VG)
DIPS ranch / pesto mayo / nduja mayo

ICE CREAM **from Rogue Ice Cream -**

Award-winning artisan ice cream made from 100% natural ingredients in the heart of Manchester.

Salted Treacle / Butterscotch / Lemon Curd / Chocolate / Pistachio / Vegan Chocolate

2. MAIN KITCHEN

ALL DAY BRUNCH SERVED 9-4PM

Choice of bread - Holy Grain sourdough, whole wheat, rye or gluten free

TOAST with jam or peanut butter or honey or marmite **(V, VGO, GFO)**

EGGS ON TOAST - 2 eggs, poached scrambled or fried on sourdough **(V, GFO)**

HOUSE MADE GRANOLA - seasonal berries, chia seed, greek yoghurt, maple **(V. VGO, GF)**

OVERNIGHT OATS - gluten free oats, almond milk, chia seeds, banana, cinnamon, cashew butter **(VG, GF)**

CHIA PUDDING coconut milk, banana, hemp seeds, cacao nibs, maple syrup **(VG, GF)**

BACON BUTTY (GFO) 4 / VEGGIE SAUSAGE BUTTY (VG, GFO) (+ fried farm egg (V))

LANCASHIRE CHEESE & MUSHROOM TOASTIE - Harissa ketchup (**V, VGO)**

TURKISH EGGS - 2 poached eggs, harissa labneh, chilli oil, pumpkin seed dukkah, dill, toasted sourdough **(V, GFO)**

FLUFFY PANCAKES
with market berries, whipped ricotta, hazelnuts, maple syrup **(V)**
+ crispy bacon +

NO AVOCADO TOAST - Poached egg, smashed broad beans, ricotta, pumpkin seeds, chilli oil **(V, GFO)**
+ crispy bacon +

SALMON MEZZE - locally smoked salmon, labneh, soft boiled farm egg, beef tomato, kimchi, mixed leaves **(GF)**

‘MANCHESTER TART’ FRENCH TOAST - buttered brioche French toast, raspberry coulis, fresh berries, desiccated coconut

FACTORY FRY UP - fried farm egg, crispy bacon, Portobello mushroom, Bury black pudding, hash brown, beans, toast **(GFO)**

VEGGIE FRY UP - fried farm egg, hash brown, halloumi, garlic butter spinach, portobello mushroom, spiced tomato relish, beans, toast (V, GFO)

VEGAN FRY UP - tofu scramble, vegan sausage, hash brown, garlic butter spinach, portobello mushroom, spiced tomato relish, beans, toast (VG, GFO)

BREAKFAST BURRITO - soft wheat tortilla filled with folded eggs, chorizo, fresh tomato salsa, cheddar, hash browns

VEGAN BREAKFAST TACOS / BURRITO - soft tortillas filled with tofu scramble, vegan chorizo, fresh tomato salsa, hash browns (VG)

KIMCHI CROQUE MADAME - Toasted sourdough, cured ham, cheddar, kimchi and a fried farm egg **(GFO)**

CHIP BUTTY - crispy hand cut chips, buttered white slice, choice of sauce - ketchup, brown sauce or curry mayo **(V, VGO)**

SIDES
CRISPY BACON 4 / BLACK PUDDING / CHORIZO / HALLOUMI (V) / CHIPS (VG) / HASH BROWN (V) / MARINATED OLIVES (VG, GF)

KIDS
CHEESE TOASTIE and veg snack plate (V)
HOUMOUS, TOASTED PITTA and veg snack plate (VG)

V - VEGETARIAN / VG - VEGAN / VGO - VEGAN OPTION AVAILABLE / GF - GLUTEN FREE / GFO - GLUTEN FREE OPTION AVAILABLE

ALLERGENS AND DIETARY REQUIREMENTS - PLEASE SPEAK TO A MEMBER OF STAFF BEFORE ORDERING YOUR FOOD
QR LINK TO ALLERGENS * ALL FOOD MAY CONTAIN NUTS AND TRACES OF OTHER ALLERGENS

EVENING 5-9PM

MIDDLE EASTERN INSPIRED ~ MANCHESTER MADE

FLUFFY STUFFED PITTAS

FACTORY FALAFEL - PICKLED CUCUMBER, GARLIC YOGHURT, TAHINI, TOMATO, CORIANDER, CRISPY POTATO SCRAPS, PICKLED CHILLIES **(V) +** ***HALLOUMI (V)***

FREE RANGE CHICKEN SHAWARMA - PICKLED CUCUMBER, GARLIC YOGHURT, LETTUCE, TOMATO, PICKLED CHILLIES

HARISSA LAMB MEATBALL - PICKLED CUCUMBER, GARLIC YOGHURT, TAHINI, TOMATO, CORIANDER, CRISPY POTATO SCRAPS, PICKLED CHILLIES

VEGAN CHICK'N SHAWARMA - YOUNG VEGANS CHICK'N, PICKLED CUCUMBER, OAT GARLIC YOGHURT, LETTUCE, TOMATO **(VG)**

***LIMITED EDITION PITTA** - ROTATING SPECIALS COLLABORATING WITH LOCAL FOOD BRANDS

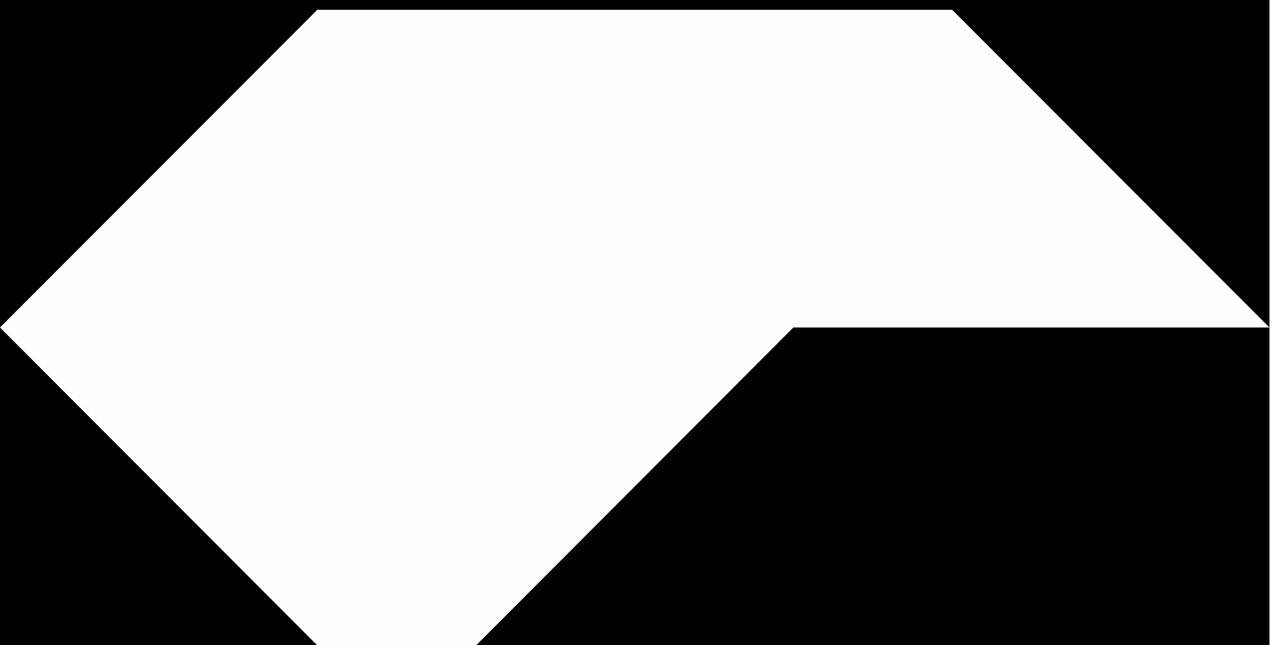
+ HOUMOUS 1.5 (VG) / HALLOUMI / CHICKEN / FALAFEL (VG) / LAMB MEATBALLS

PITTA PLATE - ALL AVAILABLE AS PITTA PLATES WITHOUT THE BREAD AND ON A BED ON MIXED LEAVES AND EXTRA PICKLES

SIDES
MARINATED OLIVES (**VG)**
PADRON PEPPERS, sumac, smoked sea salt (**VG)**
GRILLED PITTA **(VG)**
ZA'ATAR FRIES (**VG)** PLUS DIPS - HOUMOUS (**VG)** / HARISSA LABNEH **(V)** / BABA GANOUSH (**VG)** EACH
ALL 3 DIPS WITH GRILLED PITTA (**V)**
HALLOUMI FRIES - Garlic Yoghurt, Pomegranate, Chili Honey **(V)**
CRISPY ZA'ATAR CAULIFLOWER BITES AND HARISSA MAYO **(V)**
DRUNKEN FRIES **-** ZA'ATAR FRIES WITH TAHINI, GARLIC YOGHURT, CHILLI SAUCE **(V) (IDEAL TO SHARE)**

SWEET
DARK CHOCOLATE TAHINI BROWNIE, SALTED CARAMEL ICE CREAM **(V)**

factory
international



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2. Introduction

2.1. Background

An effective cleaning and maintenance strategy for extract systems, especially those used in higher risk areas such as a kitchen, is crucial for a number of reasons, primarily reducing the risk of fire to preserve life and protect buildings. It also helps prevent poor function and breakdown, increases efficiency and lengthens asset life.

2.2. Policy Statement

Aviva Studios has an extraction system fitted within three kitchen areas to extract all fumes created during the preparation of food. Factory International will implement a thorough and resilient package of maintenance and cleaning.

2.3. Scope

Aviva Studios has 3 active catering fume extraction systems:

- Ground Floor main kitchen
    - An active system which filters ducts extracted fumes externally
        - A UV-O Odour Control System
        - An ESP Grease and Dirt Management System
    - Likely to be the most significantly used
- Green Room kitchen
    - Another active system ducted externally
    - There is likely far less volume of air extracted. The area will be used for very light cooking activity, and very infrequently.
- Ground Floor bar pizza servery
    - An active locally filtered system (i.e. does not discharge externally)
    - Use of this system likely to be quite high

This document details responsibilities for daily operational staff (the Catering team), in-house Facilities Management staff (the FM team) and external cleaning and maintenance companies (Contractors).

2.4. Key Legislation

Regulatory Reform (Fire Safety) Order, 2005
Health & Safety at Work Act (HSWA), 1974
Management of Health & Safety at Work Regs (MHSW), 1999
Provision and Use of Work Equipment Regs (PUWER), 1998
Food Safety & Hygiene (England) Regs, 2013

2.5. Definitions & Abbreviations

FM: Facilities Manager, Facilities Management

3. Responsibilities

2.1 Specific Responsibilities

A

Frequency	System	Activity	Responsibility
Daily	Kitchen Extract Hood/Pipework	Report any faults or difficulty accessing for cleaning to FM Team	Catering Contractor
	Kitchen Extract	Standard operation test	Catering Contractor
	Entire System	Record any cleaning or maintenance on the CAFM System	FM Team
Weekly	Kitchen Extract Hood/Pipework	Cleaning of hoods and exposed pipework	Catering Contractor
	Kitchen Extract	Operation & Trip Test	FM Team
	Entire System (Kitchen Extract inc. UV-O and ESP,	General Inspection (for damage, standard of cleaning, signs of misuse)	FM Team
	Kitchen Extract Hood/Pipework	Basic repairs (within limits of competency)	FM Team
	ESP System	Clean inside of unit (dust & grease)*	FM Team/Contractor
	ESP System	Clean Mesh Pre-filter, ESP Collector Cell & Mesh Post-Filter, check for damage*	FM Team/Contractor
Every 2 Months	UV-O System	Clean all UV Lamps Inspect filter on UVO1000 and replace if required.	FM Team/Contractor
	Pizza Oven Extract	Slide out tray, relace lower filter layer	FM Team/Contractor
	ESP System	Service**	Contractor
Every 3 Months	UV-O System	Clean inside of unit (dust & grease)*	FM Team/Contractor
	UV-O System	Replace all filters***	FM Team/Contractor
Every 6 Months	ESP System	Clean outside of unit with mild detergent	FM Team
Annually	Entire System	Full clean	Contractor
	Entire System	Full inspection & PPM	Contractor
	ESP System	Check Door Sealing Material for damage	FM Team/Contractor
	UV-O System	Replace all UV-O Lamps	Contractor

“Entire System” refers to kitchen extract hoods, pipework, ducting to roof, all roof units, the ESP system, the UV-O system and the pizza oven hood system

* frequency to be assessed during first 3 cleans and adjusted (between weekly and quarterly)
** frequency to be assessed during first 3 cleans and adjusted (between 2 monthly and 3 monthly)
*** frequency to be assessed during first 3 cleans and adjusted (between 3 monthly and 4 monthly

3. Manufacturers Standard Servicing

1.1 Main Kitchen System

a. UV-O odour control (in kitchen)
refer to pg 33/34 equipment manual in appendix VII for the two units
(1 no UVO-1000 & 1 no UVO-500)

b. ESP airborne fat/grease control (roof plant deck)
refer to pg 6 of equipment manual in appendix V for 3 no. Purified Air ESP units triple stacked

1.2 Bar Servery Pizza Oven System

a. refer to appendix XII.

4. Manufacturers Site Specific Servicing

refer to appendix XIV

Aviva Studios - Factory International

Catering Extract Ventilation – Maintenance Plan - Appendices

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Appendix IX Bar Servery Pizza Oven – Installation Checklist

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Appendix XI Bar Servery Pizza Oven –Maintenance Checklist

Appendix XII Installation inspection sheets from Purified Air

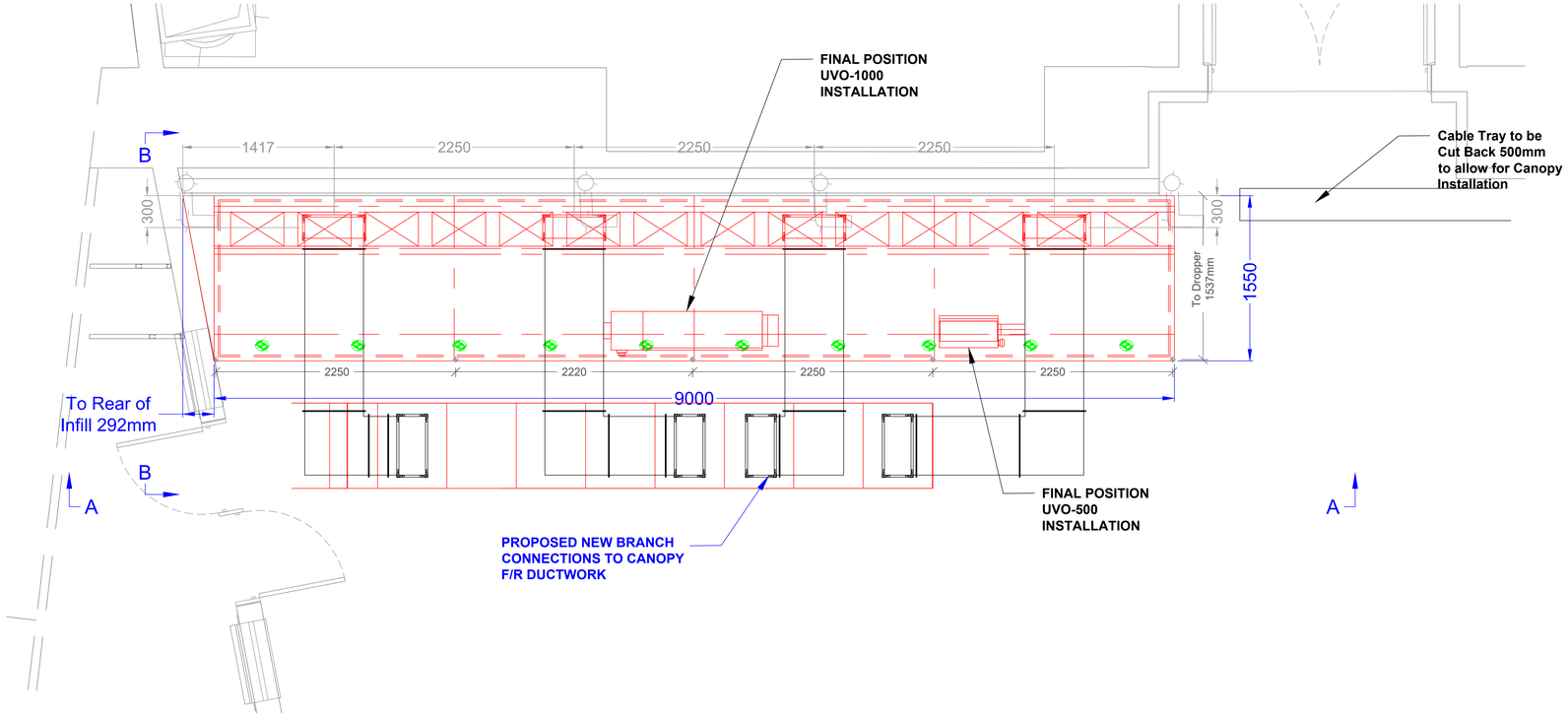
Appendix XIII Factory/Aviva site specific maintenance frequency recommendations from equipment manufacturer Purified Air

This that Maintenance Appendices should be read in conjunction with BDP catering ventilation filenote .
doc name MF-BDP-XX-XX-DN-MX-11-0096 (Ver 5 or later)
which includes rfurher elevant documents as below
- MF-BDP-ZZ-ZZ-SH-M-68-0039 Kitchen extract fan schedule
– MF-CHT-WH-GF-DR-M-57-0000 Warehouse Ground Floor Ventilation Layout (Sheet 1 of 4)
– MF-CHT-WH-XX-DR-M-50-0202 Coordinated MEP Services Opera XL to Buffer Room Riser
– MF-CHT-WH-L3-DR-M-50-0700 Warehouse Third Floor Plantdeck Multi-Service Layout Sheet 1 of 2
– MF-CHT-WH-XX-DR-M-50-0201 Warehouse Tower Riser Mech 02 (Sheet 2 of 2)
– kitchen duct to roof (a collage of the information presented in the above CHT drawings
– *Kitchen exhaust at roof level 7.5 - Ventorex Ductwork drawing*
– *Purified Air Electrostatic Precipitator Filter unit Brochure*
– *Purified Air UV-O range of ultraviolet ozone injection modules*
- Caice - Kitchen extract attenuator schedule (redacted to chosen selection)
– Kitchen extract schematic
– (*BAC-11641C Rev D As Built Kitchen Extract Canopy Assembly - including Ozone/UV treatment)*

italicised documents are duplicated in this document

Appendix I

Kitchen Canopy As-Built from Catering Projects Ltd



PLAN VIEW ON CANOPY INSTALLATION

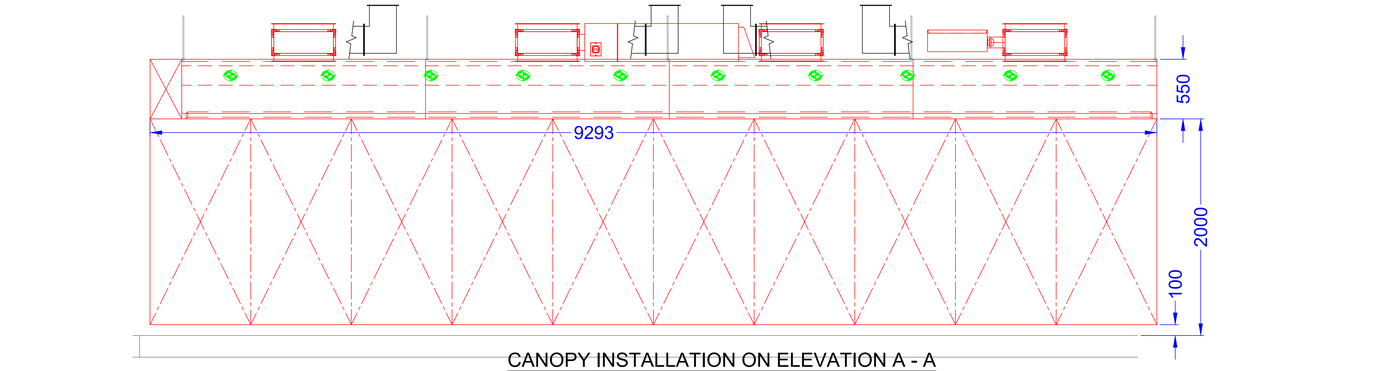
HVCA	DW/172	SPECIFICATIONS FOR EXTRACTION CANOPY UNIT						
DWG REF	ITEM	SOURCE	PLAN SIZE		AREA	COEFFICIENT	FLOW RATE	SURFACE
			Length (mm)	Width (mm)	M^2		M^3/S	TEMP °C
A7.02	Benches, Spreaders, Worktops	N/A	560	870	0.487	0.03	0.015	0.03
A7.32	Refrigeration Unit	Electric	1100	860	0.946	0.05	0.047	
A7.03	Griddle - Mild Steel	Electric	600	830	0.498	0.25	0.125	
A7.04	Benches, Spreaders, Worktops	N/A	600	870	0.522	0.03	0.016	0.03
A7.05	Grill - Salamander	Electric	600	500	0.300	0.55	0.165	
A7.07	Hob (Induction)	Electric	900	727	0.654	0.4	0.262	
A7.07a	Benches, Spreaders, Worktops	N/A	900	870	0.783	0.03	0.023	0.03
A7.06	Chargrill	Electric	1305	870	1.135	0.52	0.590	
A7.28	Refrigeration Unit	Electric	1100	860	0.946	0.05	0.047	
A7.08	Benches, Spreaders, Worktops	N/A	300	870	0.261	0.03	0.008	0.03
A7.09	Deep Fat Fryer	Electric	402	765	0.308	0.45	0.138	
A7.11	Benches, Spreaders, Worktops	N/A	400	260	0.104	0.03	0.003	0.03
A7.12	Server Counter - Hot Food	Electric	490	735	0.360	0.24	0.086	
A7.13	Benches, Spreaders, Worktops	N/A	490	870	0.426	0.03	0.013	#N/A
A7.29	Bains Marie	Electric	565	400	0.226	0.15	0.034	#N/A
A7.15	Benches, Spreaders, Worktops	N/A	1230	870	1.070	0.03	0.032	#N/A
A7.17/17b	6 Grid /10 Grid (Stacked)	Electric	850	776	0.660	0.6	0.396	#N/A
A7.21/21b	6 Grid /10 Grid (Stacked)	Electric	850	776	0.660	0.6	0.396	#N/A
A7.09c	Deep Fat Fryer	Electric	402	765	0.308	0.45	0.138	
A7.09d	Deep Fat Fryer	Electric	402	765	0.308	0.45	0.138	
				Theoretical Extract volume required			2.940	m^3/s
		Canopy Type		***Overhead Wall Single Open End***			1.200	
				SPECIFIC ***EXTRACT*** FLOW RATE REQUIRED			**3.528**	m^3/s
				SPECIFIC ***SUPPLY*** FLOW RATE REQUIRED			**2.999**	m^3/s

NOTES.
N1. CANOPY TO BE MANUFACTURED IN FINE GRAIN 304St/St.
N2. TO BE SUPPLIED C/W 14off 500x500mm BAFFLE STYLE GREASE FILTERS.
N3. SPIGOT VELOCITY THROUGH EXTRACT SPIGOTS 6.4ms
N4. EXTRACT PRESSURE DROP ACROSS CANOPY 150Pa.
N5. Not Used.
N6. Not Used.
N7. CANOPY TO CONTAIN 10off LED STYLE LIGHTS C/W 1.5mtr FLEX FOR CONNECTION BY OTHERS.
N8. APPROXIMATE CANOPY WEIGHT 360Kg's
N9. CANOPY TO BE MANUFACTURED IN 4off SECTIONS.
N10. INSTALLATION TYPE - SPIGOT ONLY INSTALLATION.
N11. TO BE MANUFACTURED FOR T.B.C.
N12. Not Used.
N13. Not Used.

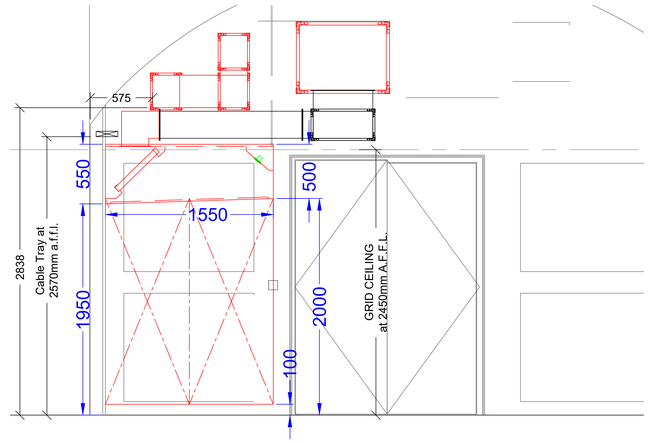
COMMENTS.
C1. PROPOSED LIGHT FITTINGS IN CANOPY LOCATION TO BE RE-LOCATED TO AVOID FOOTPRINT OF CANOPY.
C2. ALL PROPOSED AND INSTALLED DUCT INSTALLATIONS WITHIN CANOPY FOOTPRINT TO BE RE-LOCATED.
C3. CLIENT TO CONFIRM BEST LOCATION FOR SYSTEM CONTROLS.
C4. PROPOSED LOCATIONS FOR INSTALLATION OF UVO-1000 AND UVO-500 TO BE CONFIRMED BY CLIENT.

FOR ANSUL SYSTEM REFER TO SUPPLIER INFORMATION.

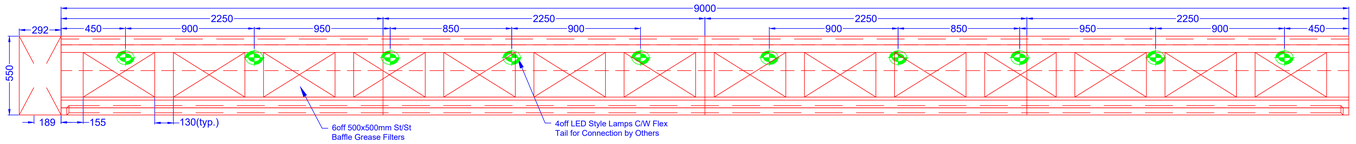
AIR SUPPLY SYSTEM.
S1. AIR SUPPLY SYSTEM TO BE SUPPLIED AS LOOSE ITEMS FOR INSTALLATION ON SITE TO INCLUDE
8off EGG CRATE GRILLS (600 x 600mm)
2off 4Way CEILING DIFFUSERS c/w PLENUM BOX WITH Ø250mm SPIGOT CONNECTION
(Note. the quantities above are to be split evenly between 2off supply air systems)
S2. ROOMS TO END OF KITCHEN TO HAVE INSTALLED
3off EGG CRATE GRILLS (600x600mm) c/w PLENUM BOX TO SUIT WITH Ø150mm SPIGOT
1off Ø200mm SPIRAL END CAP
S3. ESP 6000's SHOWN FOR RECOMMENDED CONFIGURATION ONLY, FINAL INSTALLATION TO BE CONFIRMED AND INSTALLED BY OTHERS.



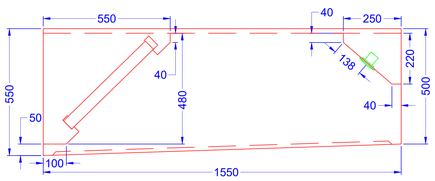
CANOPY INSTALLATION ON ELEVATION A - A



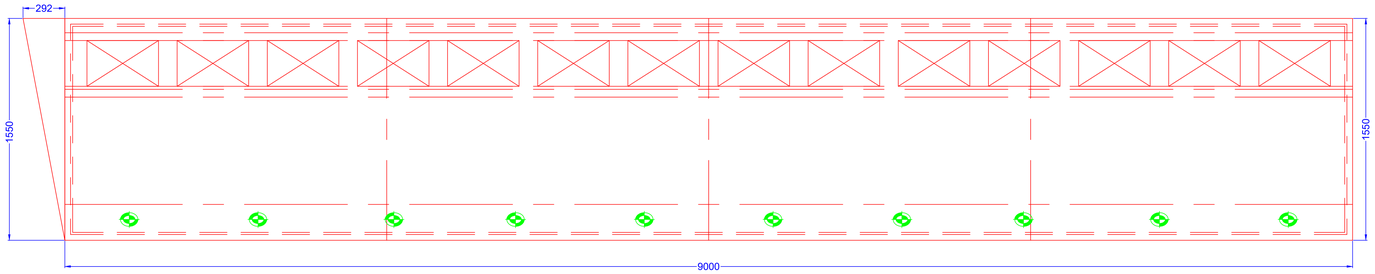
CANOPY INSTALLATION
ON ELEVATION B - B



View on Baffle Filters



Canopy Profile



Canopy Assembly on Plan View

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DIMENSIONS

All wall dimensions indicated on this drawing are the minimum finished wall dimensions as required by Catering Projects Limited and any differences or variations on site or on contract drawings are to be brought to the attention of Catering Projects Limited immediately. All dimensions are to checked on site and are not to be scaled from the drawing.

GENERAL NOTES

A 1000mm opening is required giving a 900mm clear door opening to at least one side of equipment to allow for servicing and maintenance at point of on installation and for general servicing during life of the kitchen.

All mechanical service pipework run by the main contractor is to drop down from ceiling or to follow agreed pipework runs so as not to hinder equipment pushing hard to walls. All service runs / drops to be agreed prior to first fix runs.

All heights of electrical boxes refer to the underside of the isolator boxes/socket boxes.

All services provided by main contractors, mechanical contractors and electrical contractors are to be run to the position shown on the equipment drawing or to within one (1) metre of the equipment connection points.

Rev	Brief Description	Date	Drwn
D	Drawing final issue released 'As Built' issue	07.07.23	J.H.
C	Final changes made to layout, cook line revised in line with latest information, weight added to layout, released for final approval	26.04.23	J.H.
B	Drawing revised in line with site survey information and released for canopy approval for manufacture	19.04.23	J.H.
A	Initial issue released for comments	13.03.23	J.H.

Client/Project

Drawing Title

Proposed Kitchen Extract Canopy Assembly & Installation

Drawn by	J Hindle	Date	13.03.23
Scale	1 : 20 @ A0		
Drawing Number	BAC-11641C	Revision	D

ISSUED AS BUILT

Catering Projects Ltd
Unit 2
Waterloo Court
Markham Lane
Markham Vale
Chesterfield S44 5HN
Tel: 01246 811 575
office@catering projects.co.uk

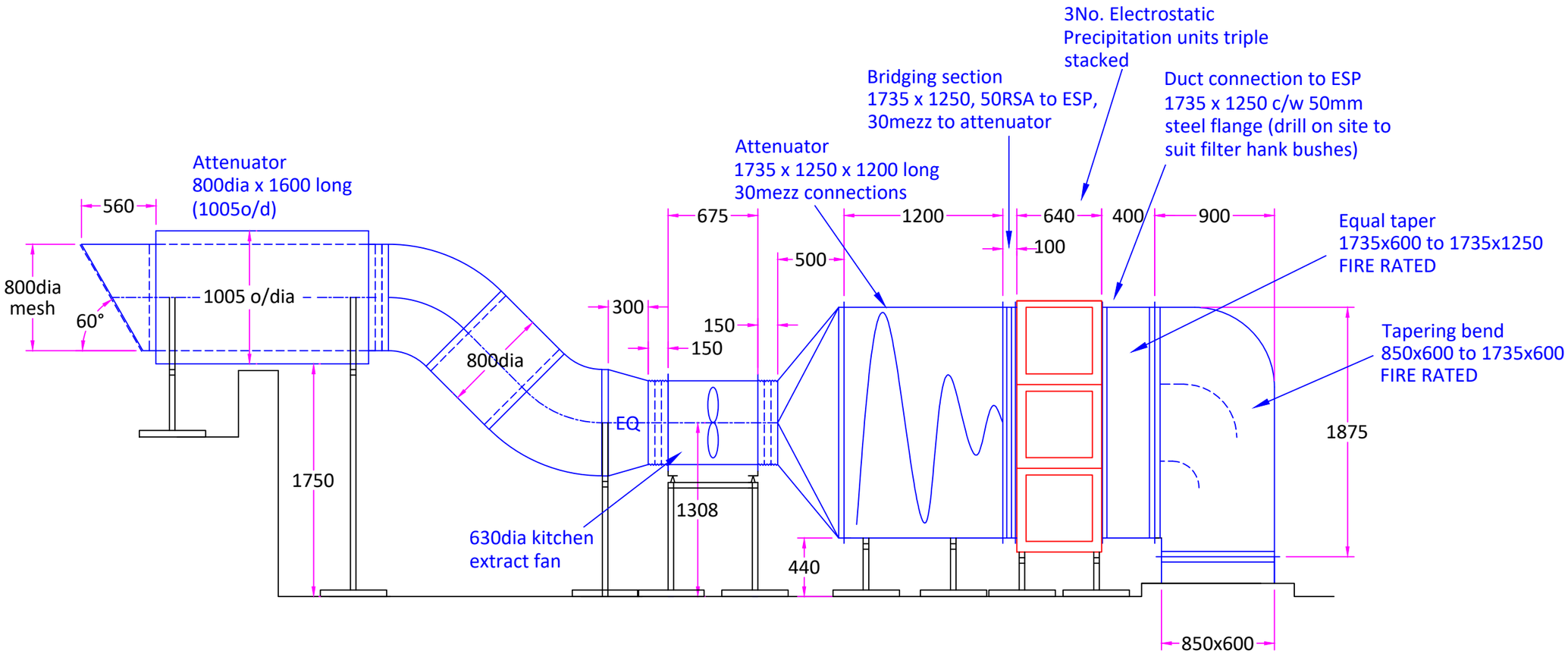
www.cateringprojects.co.uk

design | build | care

2005/2021 14-16/02

Appendix II

Kitchen Exhaust – Level 7.5 equipment layout



PROPOSED KITCHEN EXHAUST SYSTEM LEVEL 7.5

Appendix III Triple Pass ESP arrangement

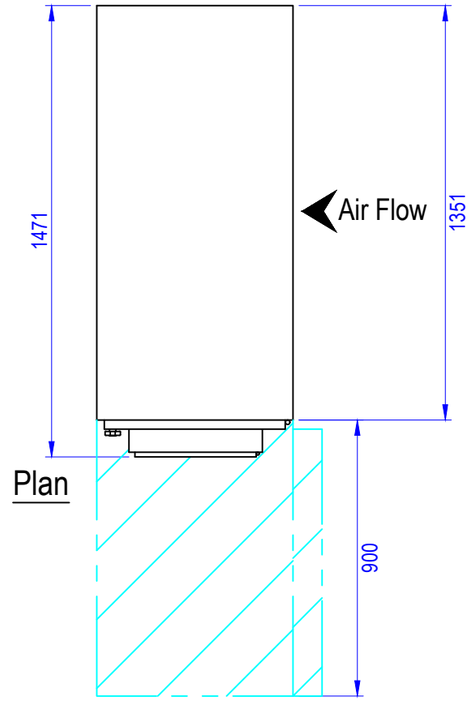
All dimensions in millimeters
Do Not Scale

Note
The system can be reconfigured if air flow direction is different to that shown.
Transition and ducting sections in between units drawn for indication purposes only. All transition pieces and ducts to be designed, supplied and installed by others.

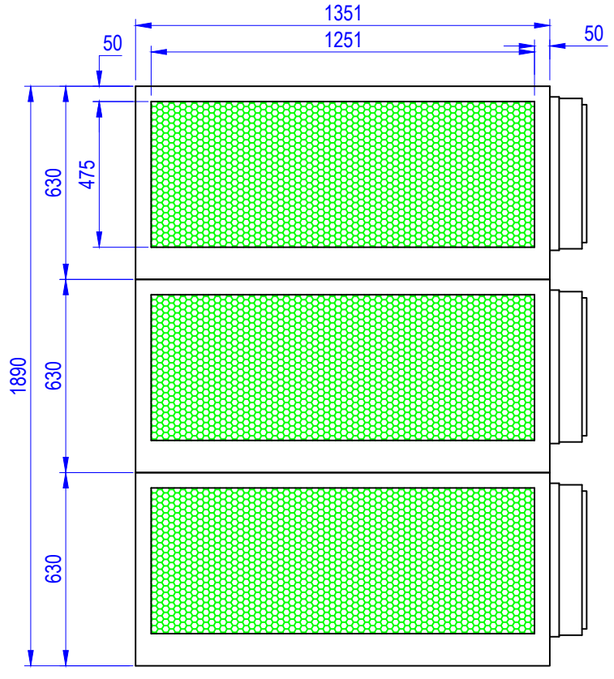
Service Space

Note: If access equipment is necessary service requirements may vary.

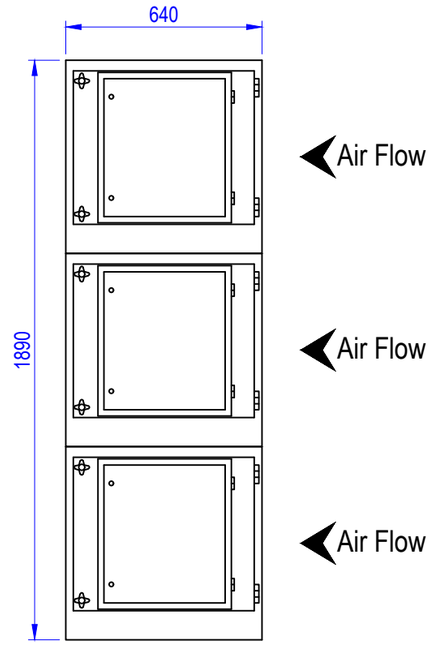
Max. Air Volume through system 6.3m³/s



Plan



Side Elevation on ESP



Front Elevation

C:\Users\martink\Documents\PAL\Logos\Purified air Logo. URL strap copy.png

PURIFIED AIR LTD
LYON HOUSE, LYON ROAD, ROMFORD,
ESSEX, RM1 2BG
TEL:01708 755414
FAX:01708 721488
e-mail : info@purifiedair.co.uk

PURPOSE OF ISSUE:-

Overall Dimensions of ESP4500EI (R to L)

CLIENT
-

LOCATION
-

DATE: 22.10.14
DRAWN:

SCALE: 1:20 @ A3
CHECKED:

DRAWING NO.: E3
REV.: -

Appendix IV Purified Air ESP4500 Operation Manual

purified air®
since 1984

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.



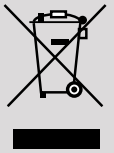
INFORMATION

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.

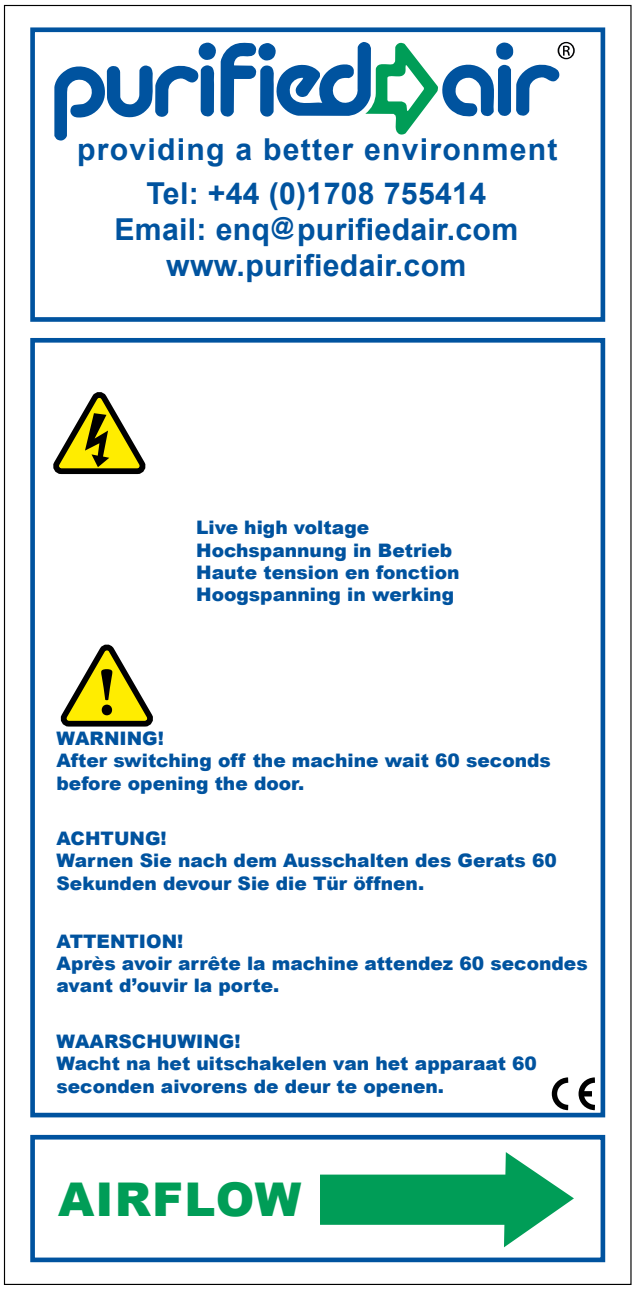


Figure 1 - Unit Label

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 (O_3) 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.

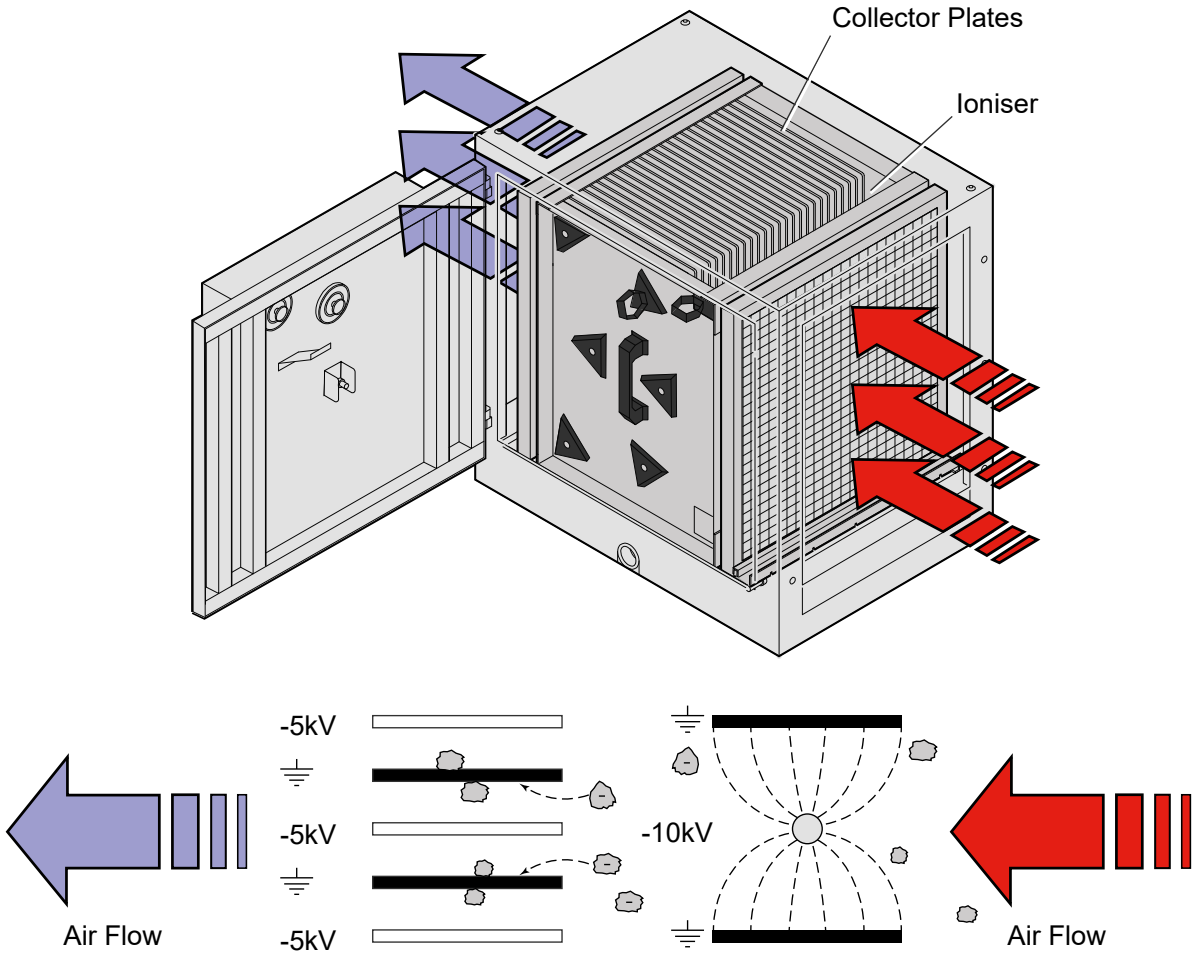


Figure 4 - Electrostatic Precipitator (ESP) - Operating Principles

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 Preciptator 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.

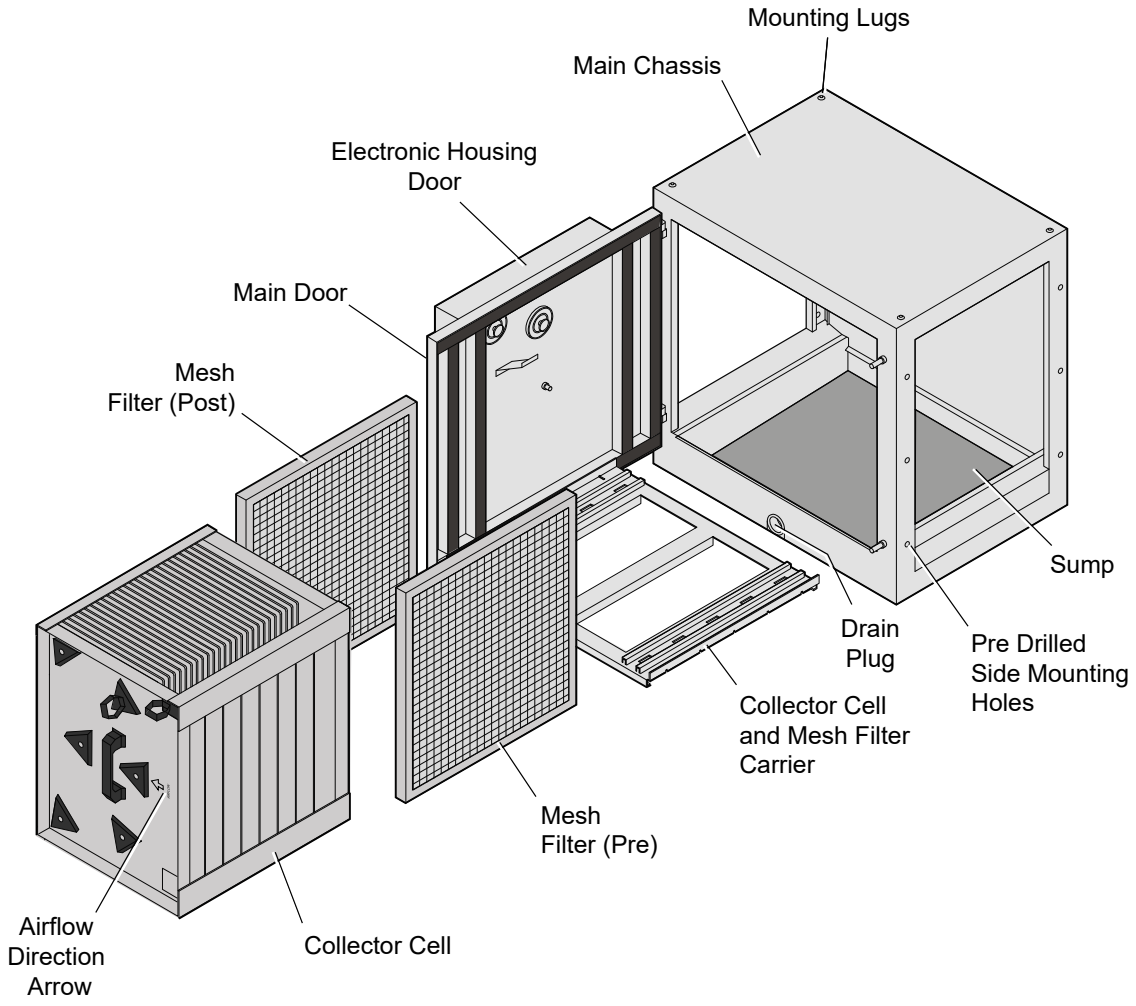


Figure 5 - Electrostatic Precipitator Unit - Main Chassis Components

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.

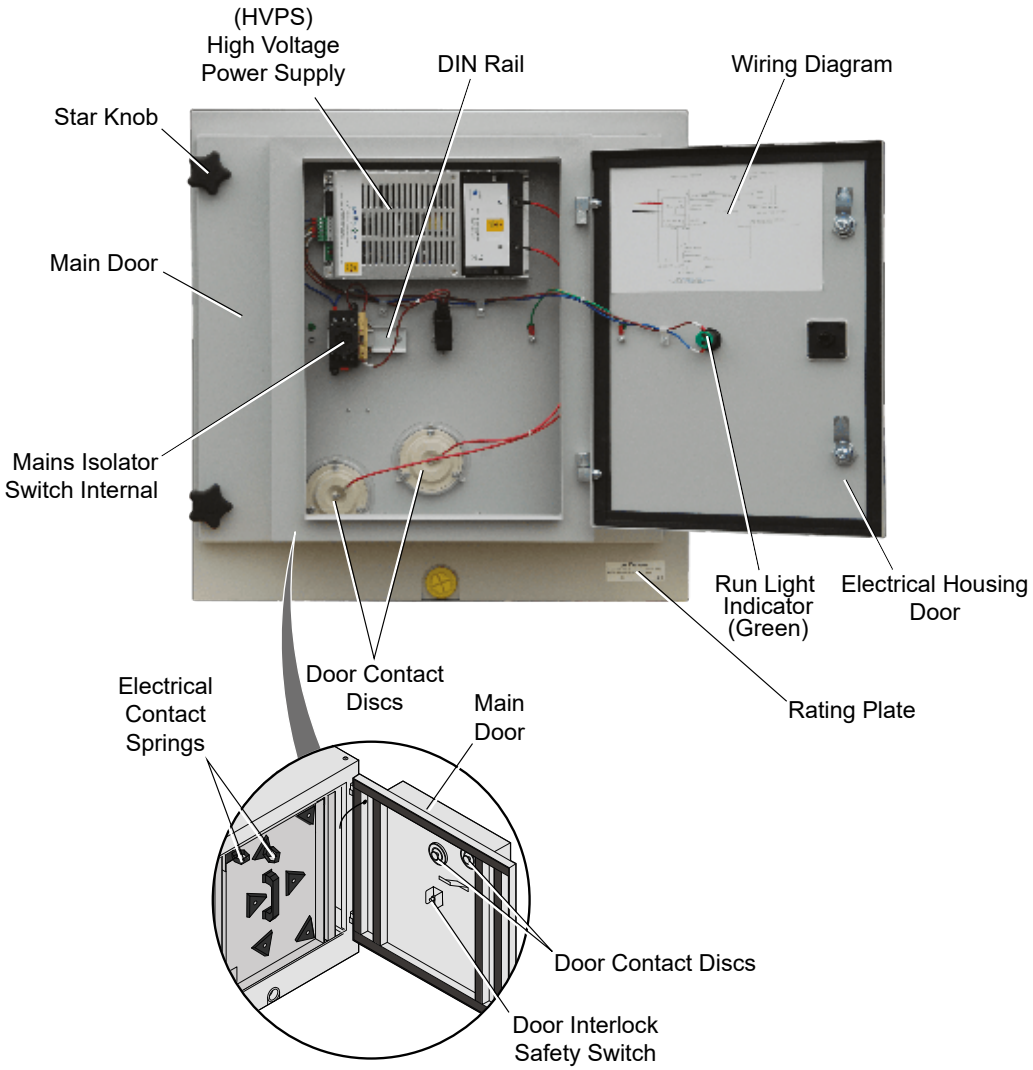


Figure 6 - Door Assemblies

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.

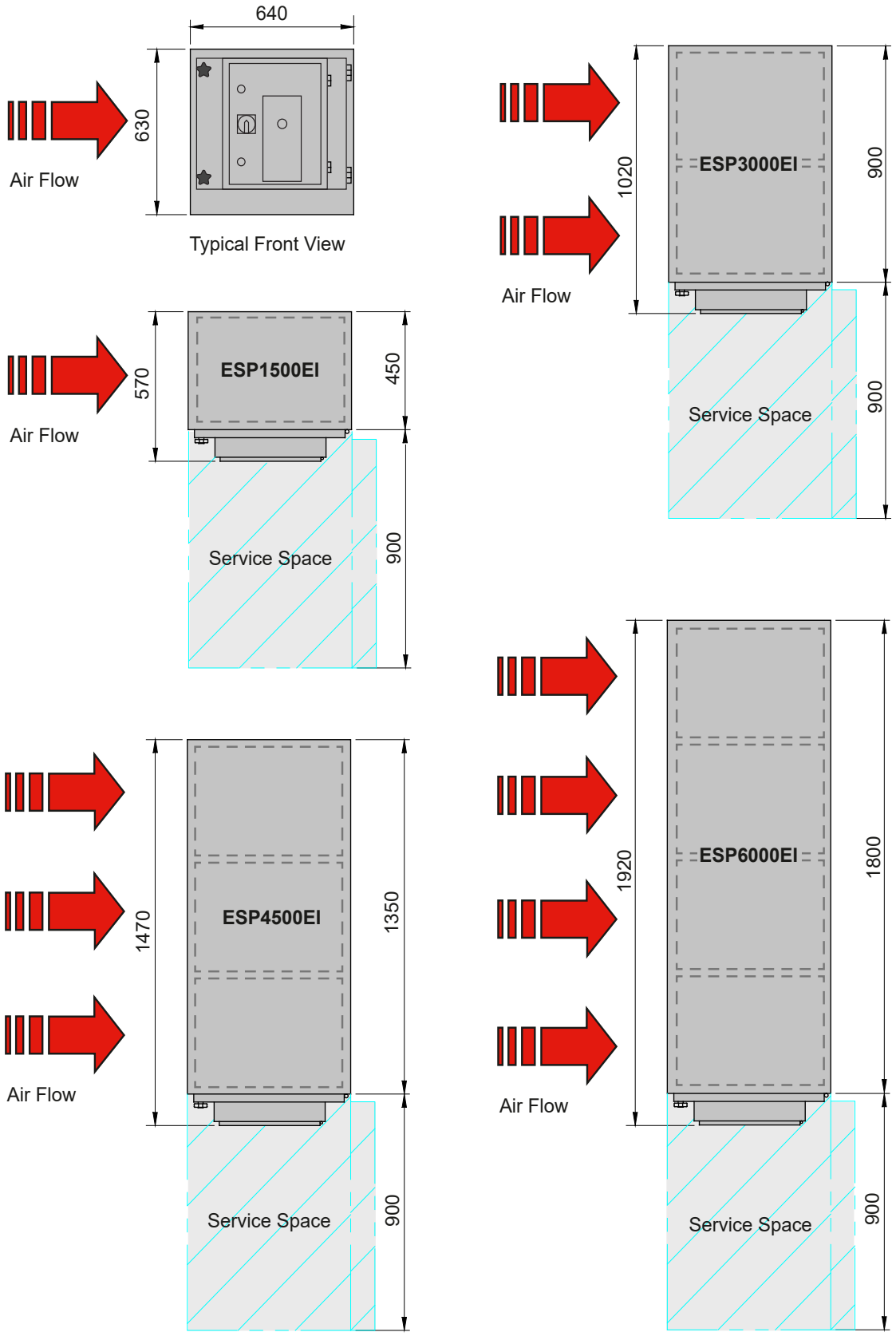


Figure 7 - Model Dimensions - ESP 1500EI, ESP 3000EI, ESP 4500EI and ESP 6000EI

(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:

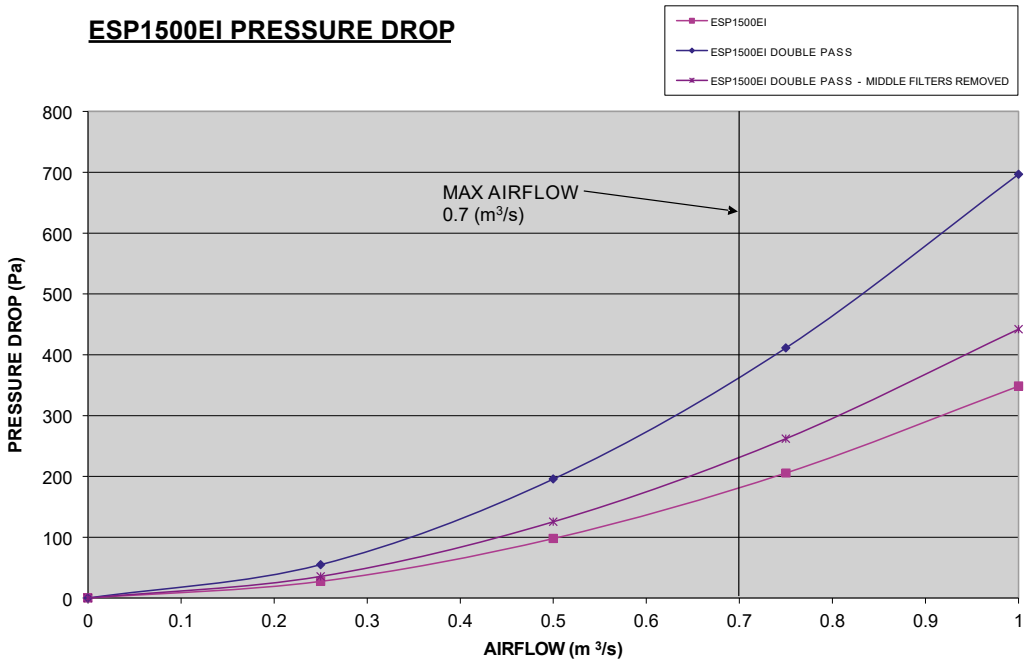


Figure 8 - Graph of ESP 1500EI Pressure Drop

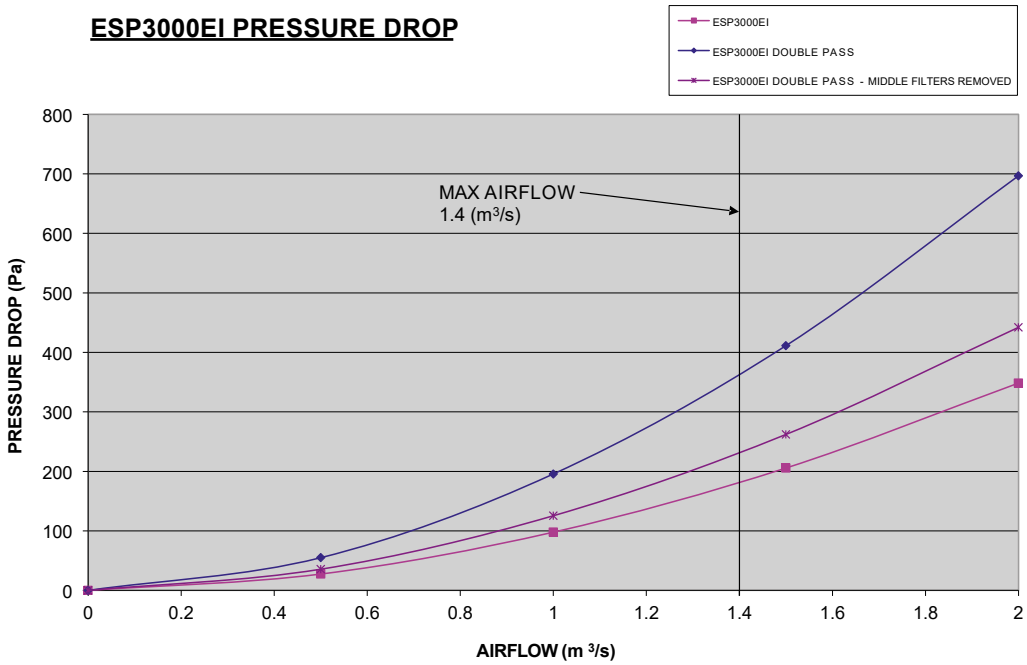


Figure 9 - Graph of ESP 3000EI Pressure Drop

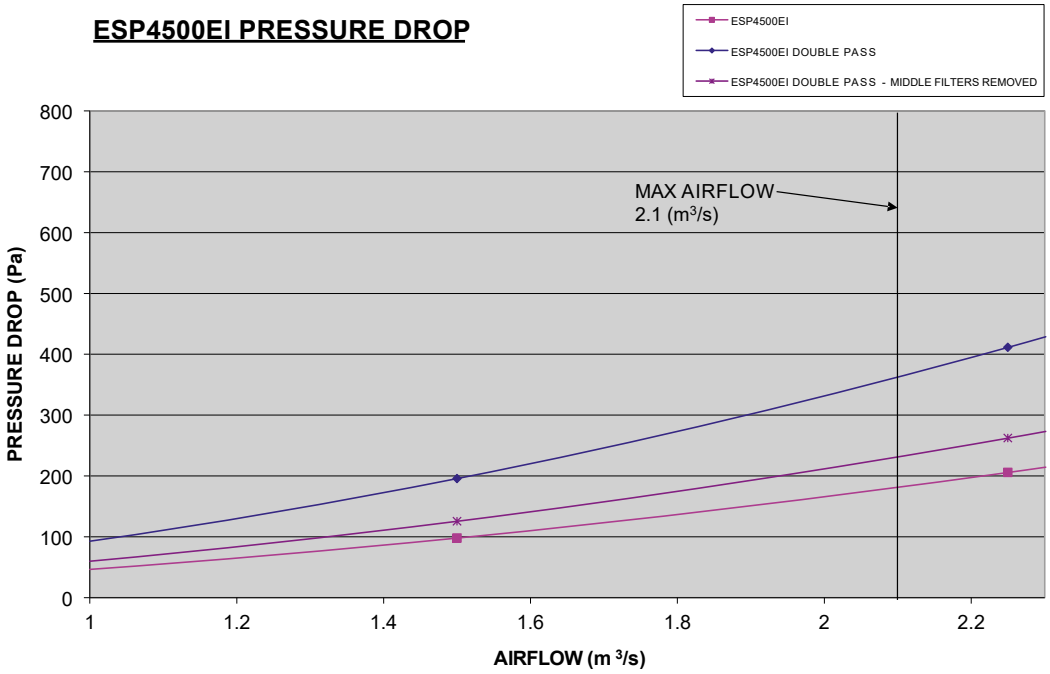


Figure 10 - Graph of ESP 4500EI Pressure Drop

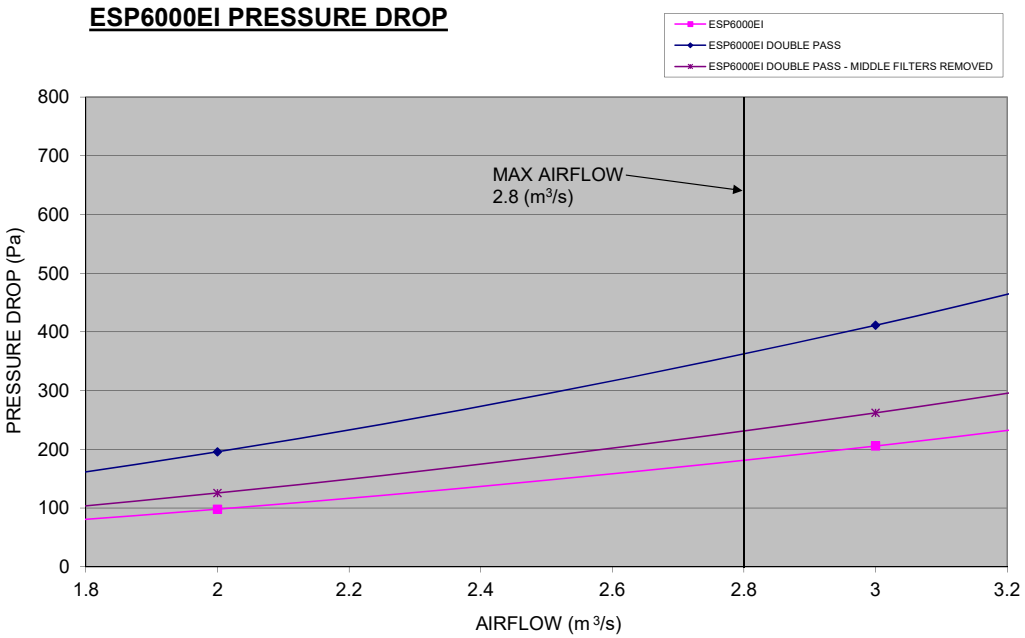


Figure 11 - Graph of ESP 6000EI Pressure Drop

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.

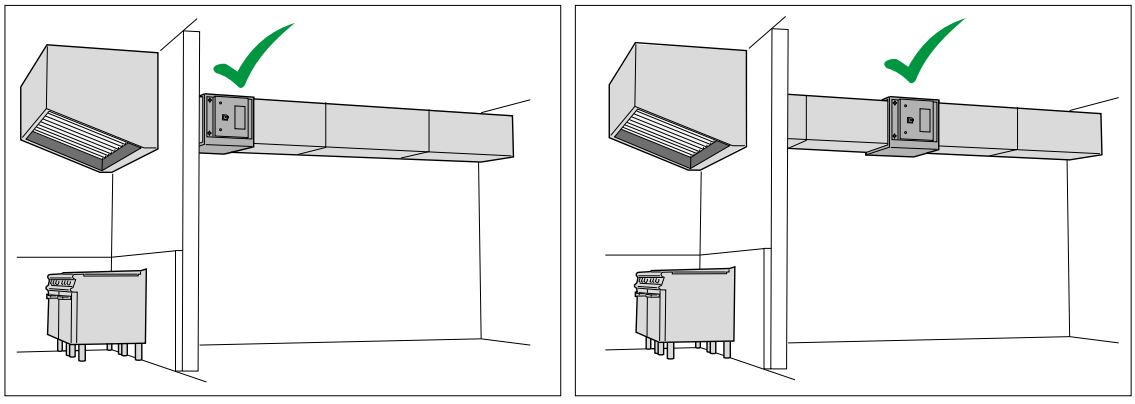


Figure 12 - Preferred Mounting of Filter Unit

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.

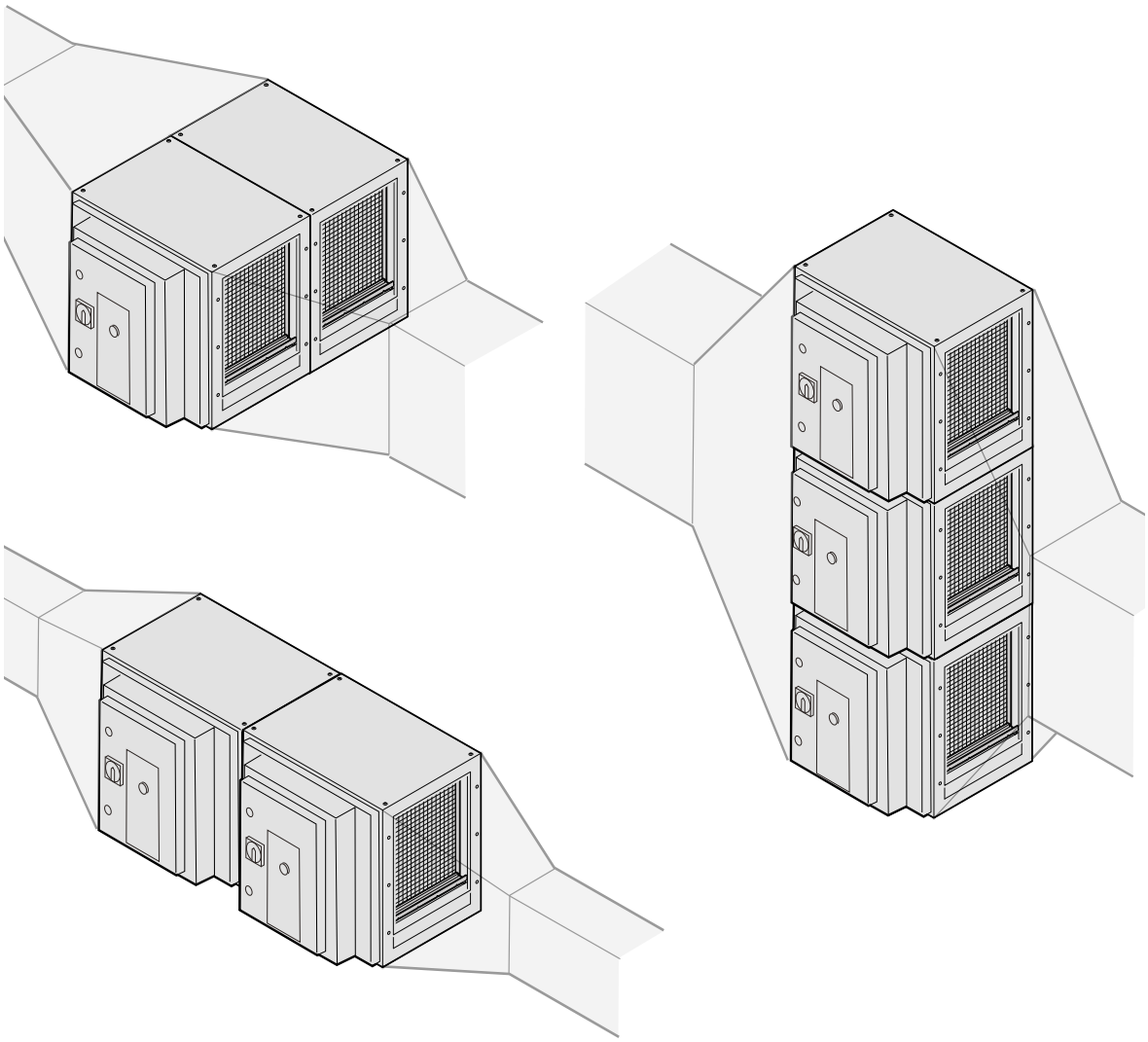


Figure 13 - Multiple Unit Installation Examples

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 easy 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-Handing 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.

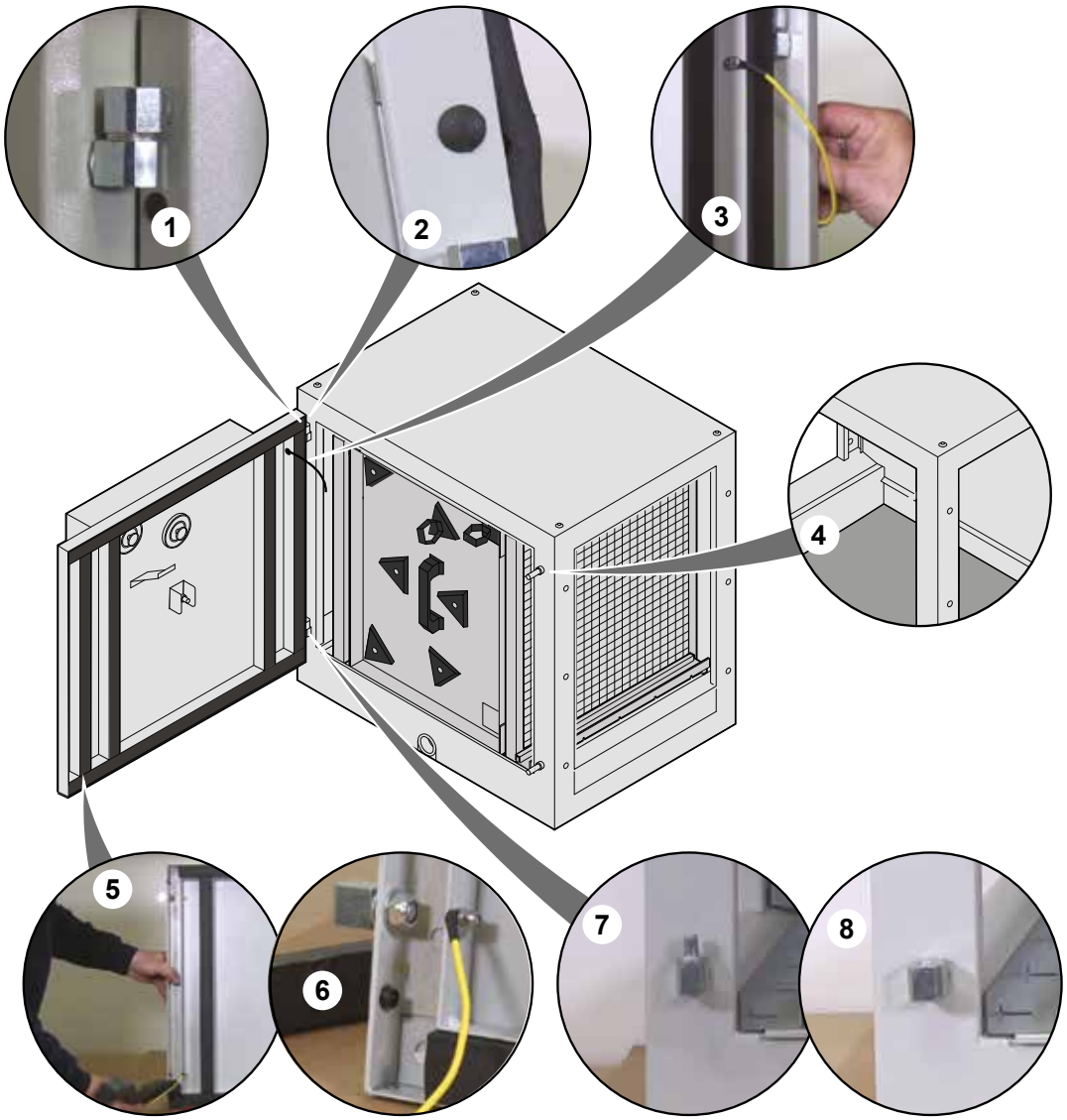


Figure 14 - Re-Handing Process Components

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 ❼ 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 ❽ 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 ❽ 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 ❻.
13. Remove the Hinge Blocks ❻ using a combination of an adjustable spanner and pliers.
14. Replace the Hinge Blocks ❻ 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 ❼ into the hinge pin location holes in the Hinge Blocks ❽ 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.

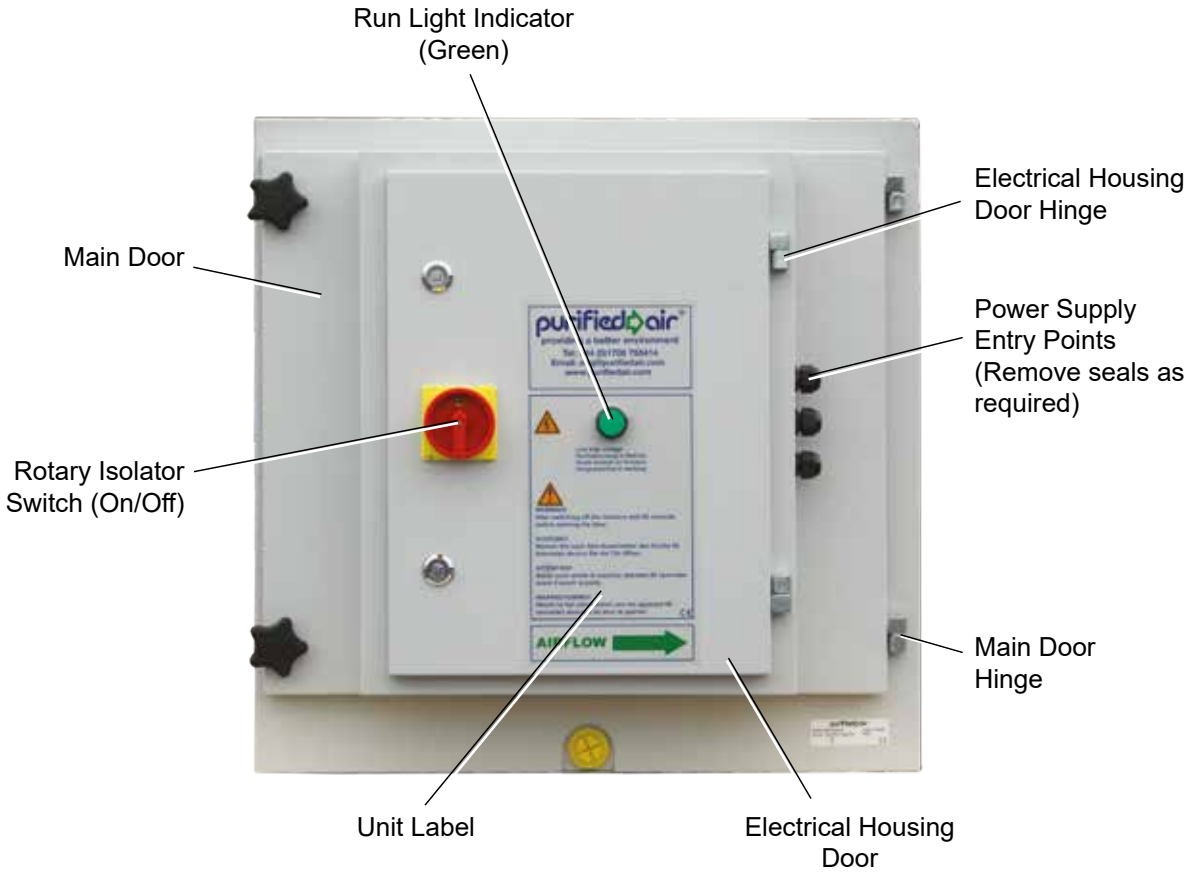


Figure 15 - Control Panel Components

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).

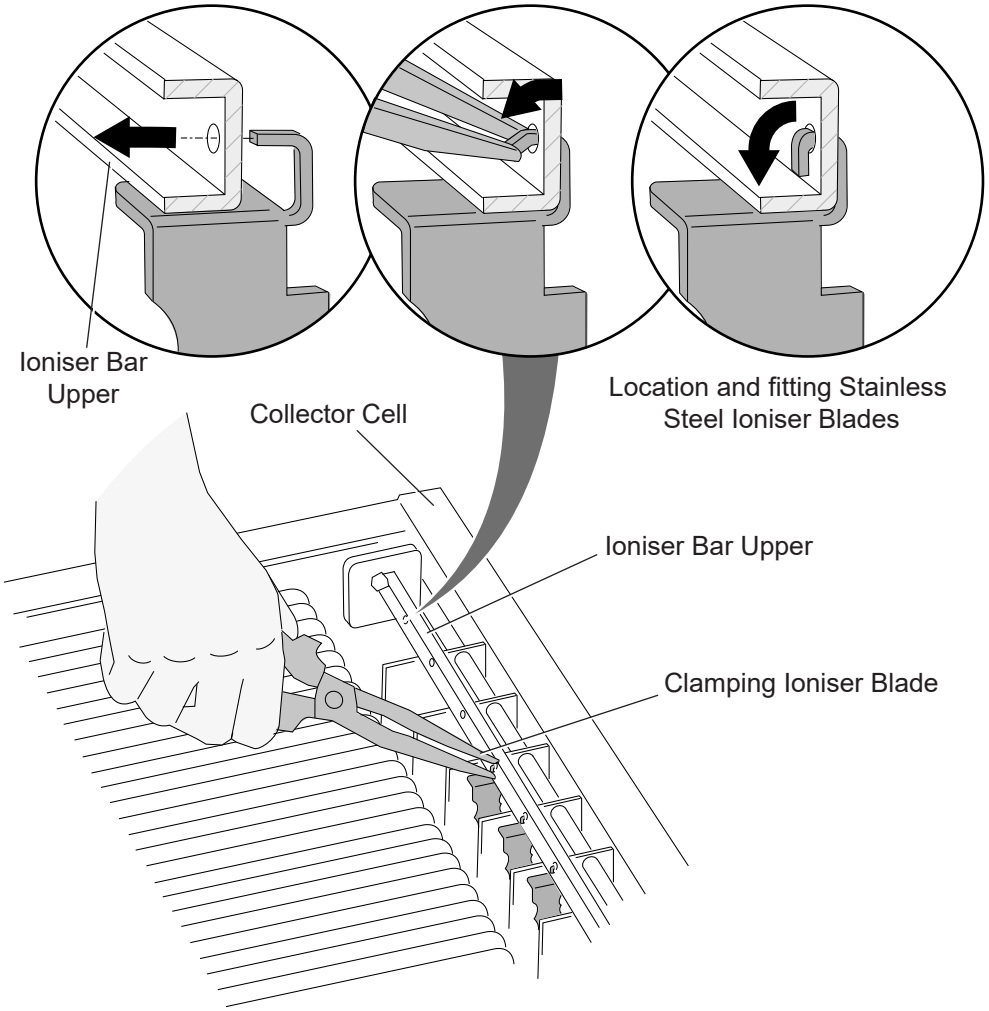


Figure 17 - Fitting Stainless Steel Ioniser Blades

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 Ionizer 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

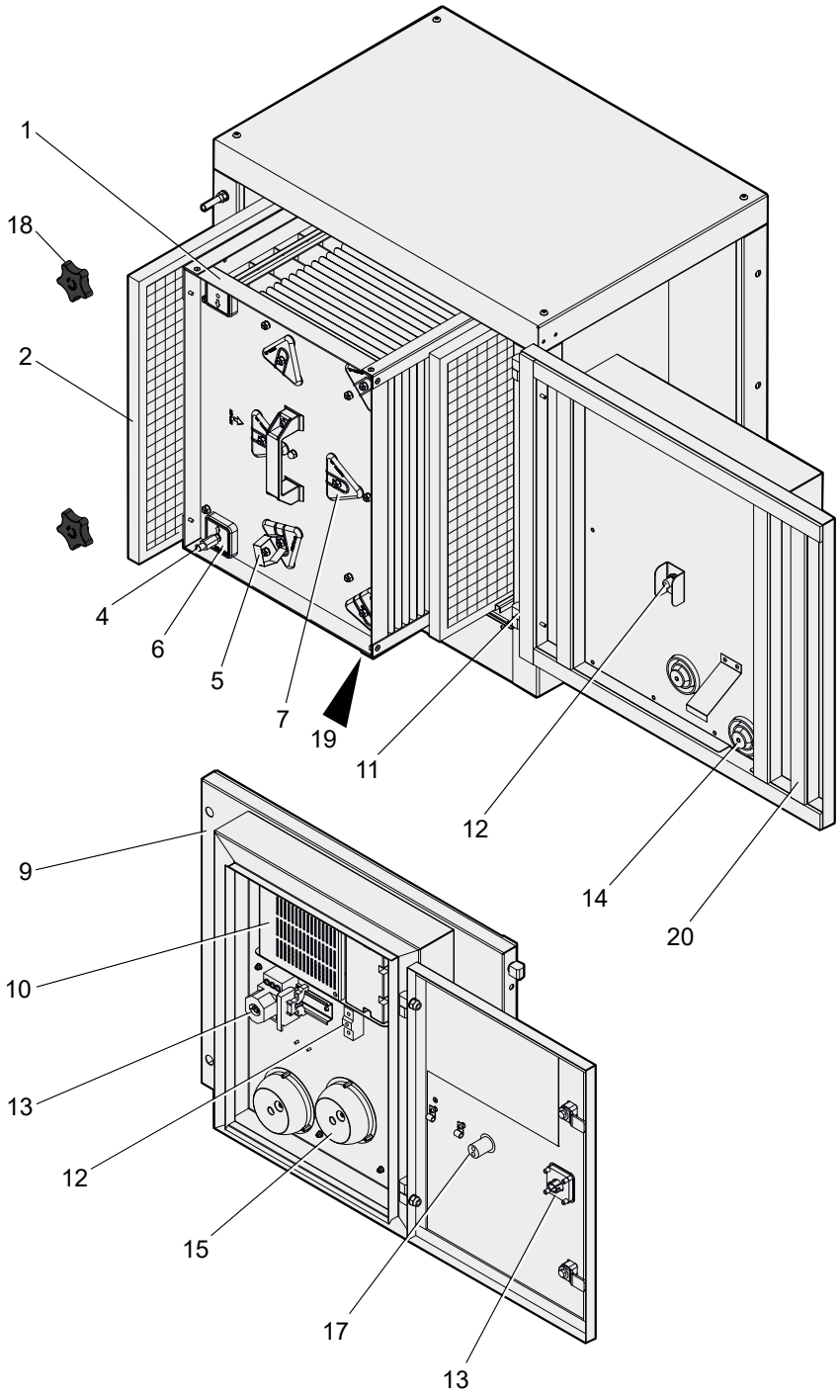


Figure 18 - Parts List Components Illustration

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

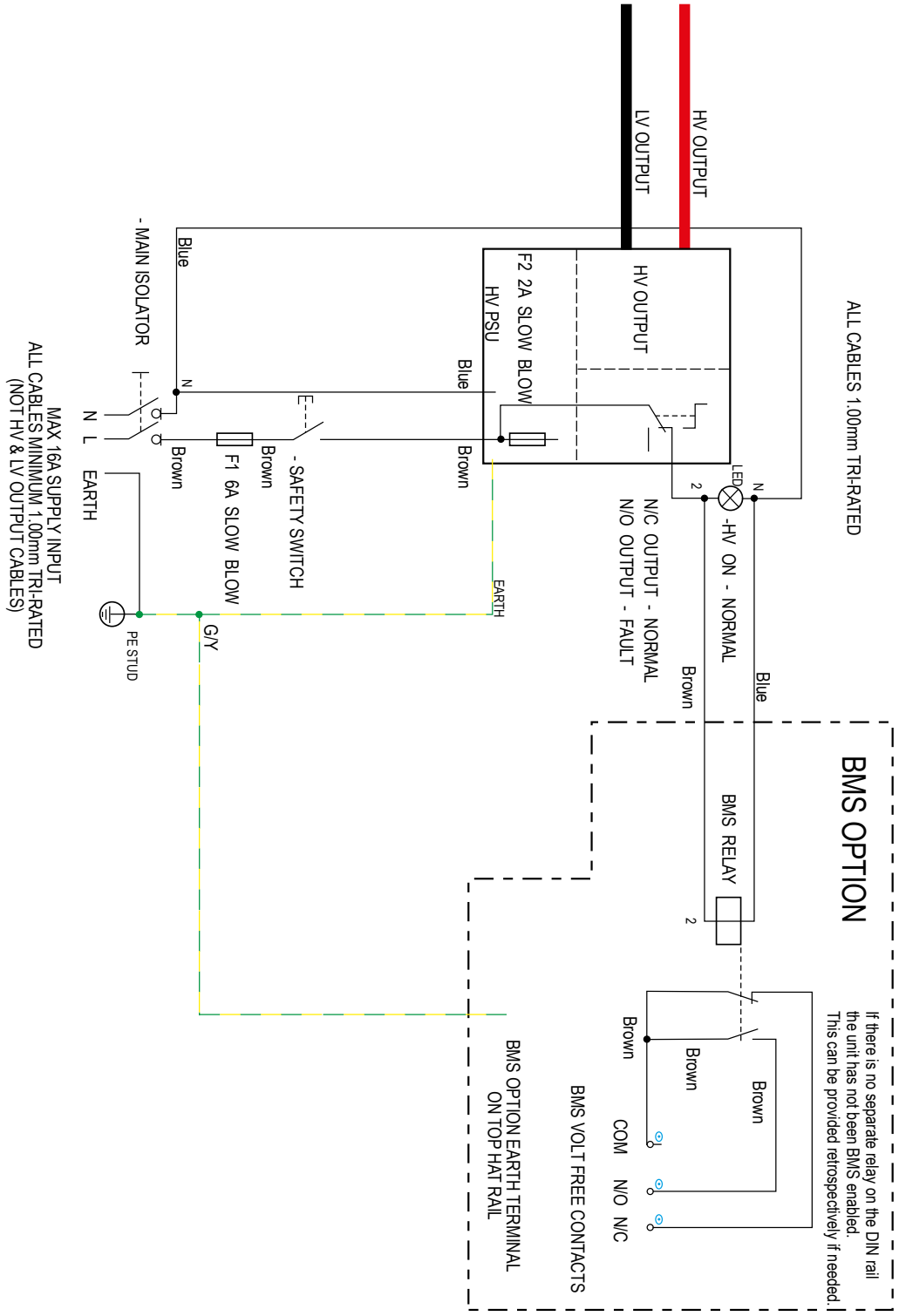


Figure 19 - Unit Wiring Diagram

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

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	*Electrostatic Precipitator*			
Make/Brand	*Purified Air*			
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

purified air®
since 1984

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.

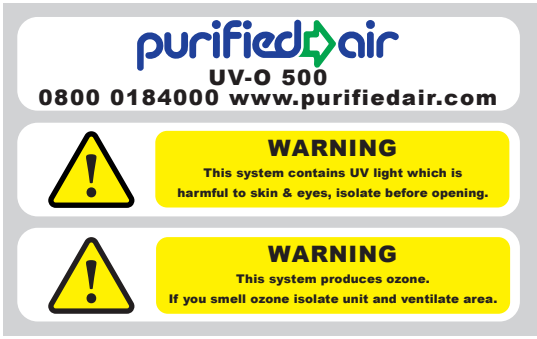


Figure 1 - UV-O 500 Unit Label

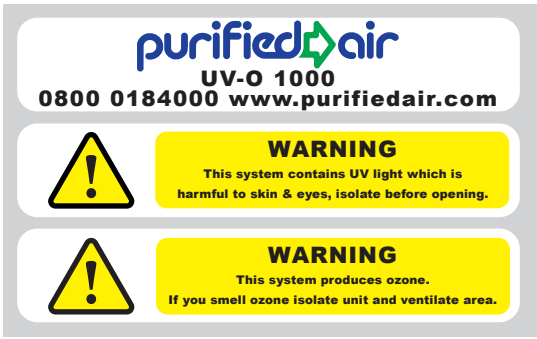


Figure 2 - UV-O 1000 Unit Label

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 (O_3) 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 negetive 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).

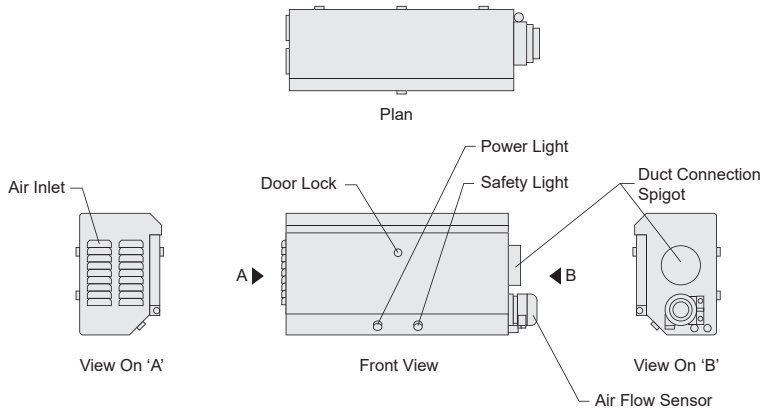


Figure 7 - UV-O 500 - Views



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).

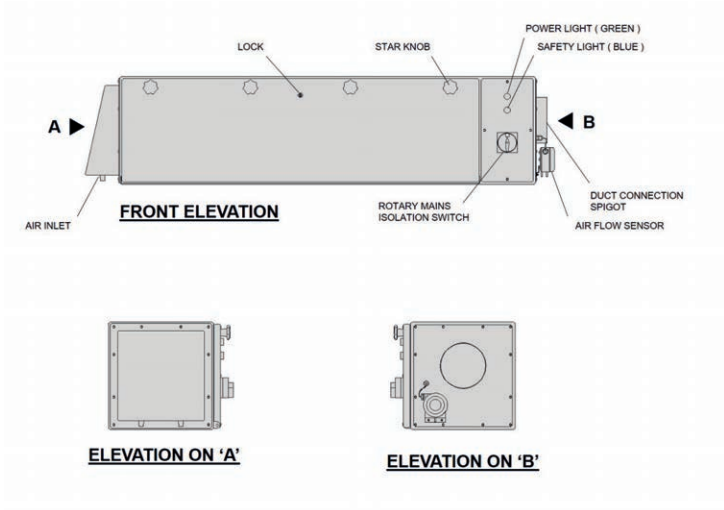


Figure 10 - UV-O 1000 - Front and Side Views



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

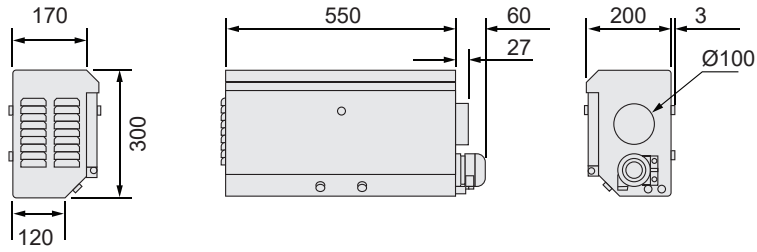


Figure 13 - UV-O 500 - Dimensions
(All Dimensions in Millimetres)

4.2.2 UV-1000 Unit Dimensions

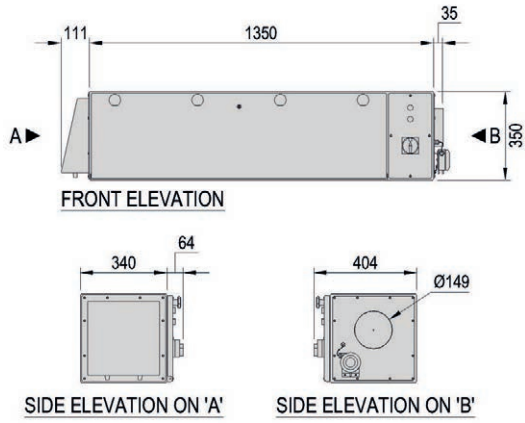


Figure 14 - UV-O 1000 - Dimensions
(All Dimensions in Millimetres)

4.3 Installing the UV-O 500 Unit

4.3.1 Installing the UV-O 500 Main Chassis

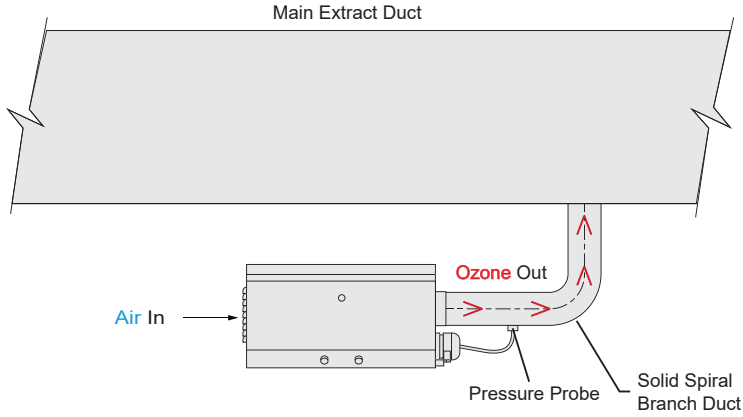


Figure 15 - UV-O 500 Installation Schematic

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.

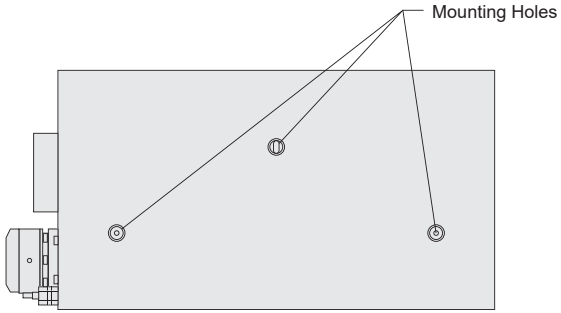


Figure 16 - UV-O 500 Mounting Holes

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).

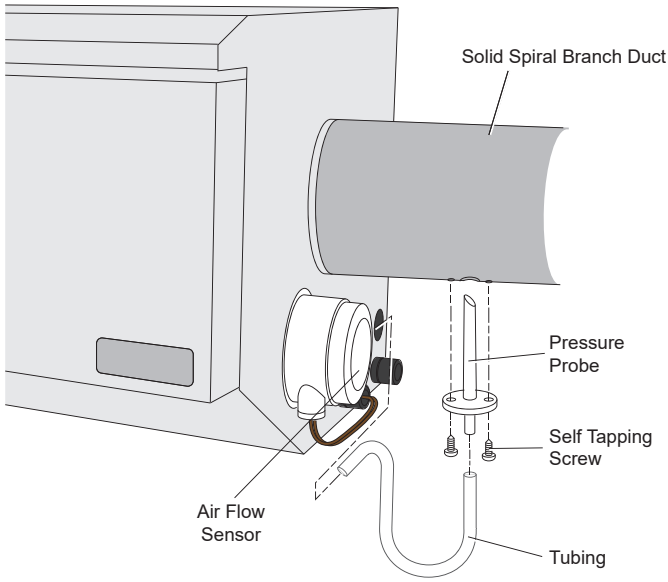


Figure 18 - Installing the Air Flow Sensor's Pressure Probe

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):

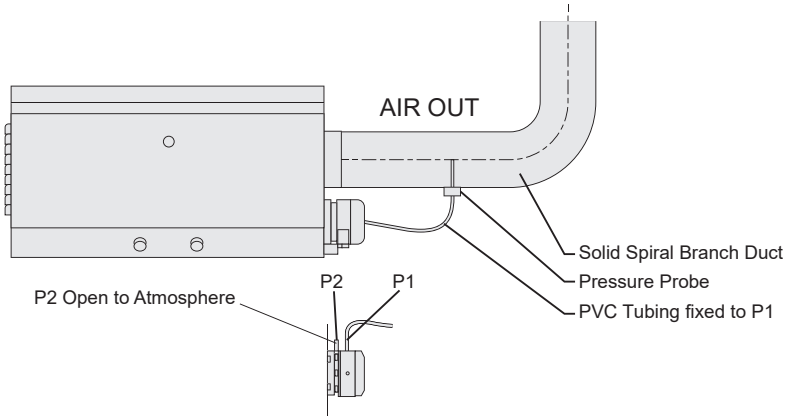


Figure 19 - Connecting the Air Flow Sensor's Pressure Probe

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

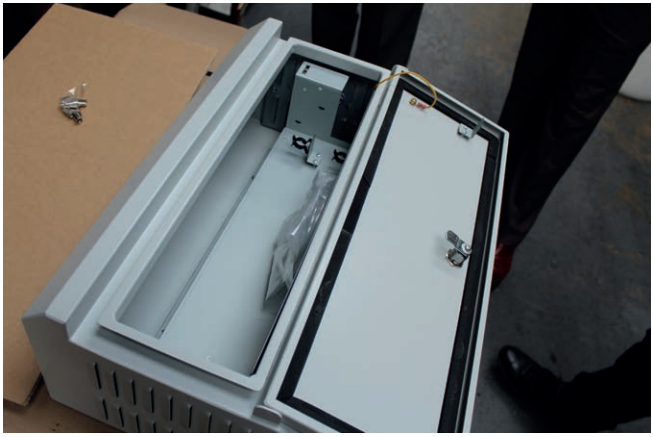


Figure 21 - UV-O 500 UV Lamp Location

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:

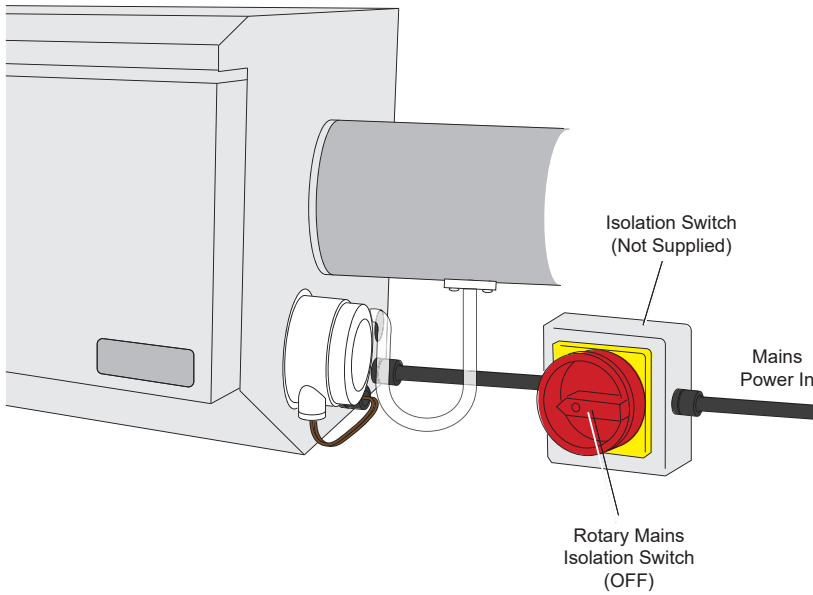


Figure 22 - Installation of Rotary Mains Isolation Switch

- 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

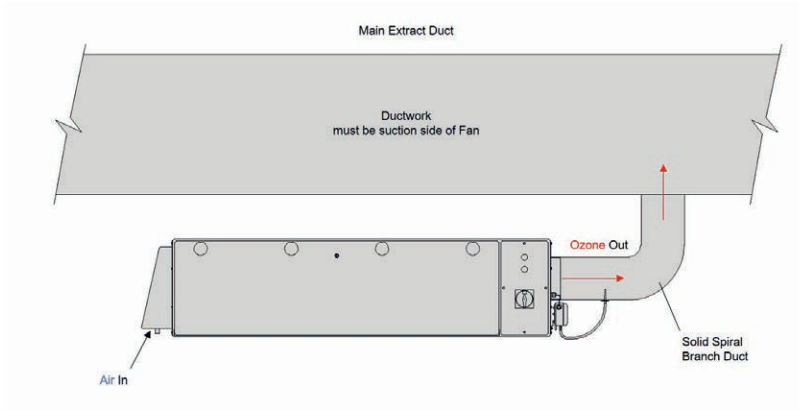


Figure 24 - UV-O 1000 Installation Schematic

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:

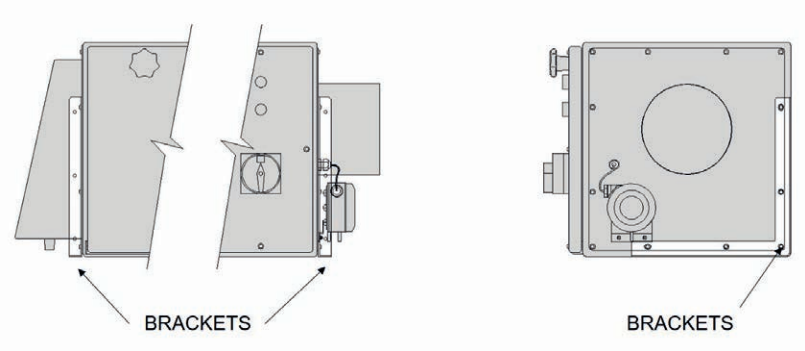


Figure 25 - UV-O 1000 Mounting Bracket Installation

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).

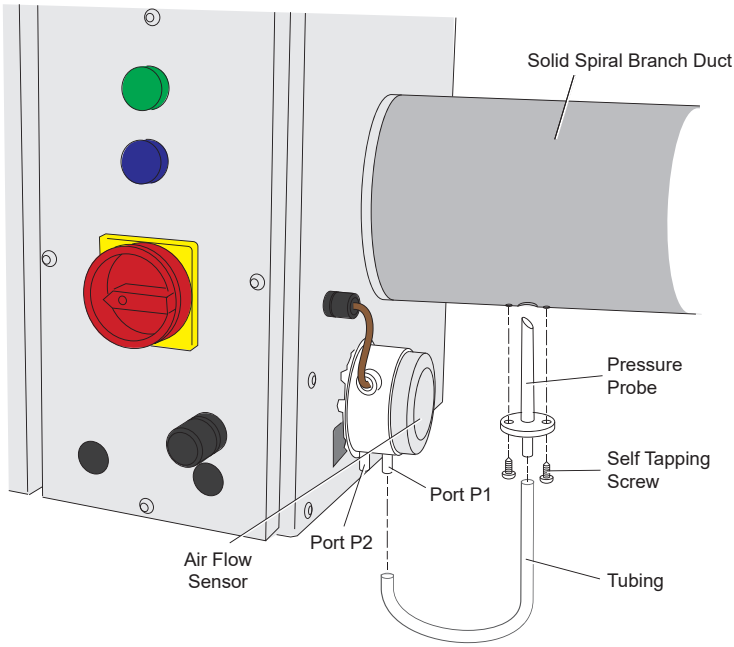


Figure 27 - Installing the Air Flow Sensor's Pressure Probe

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

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:

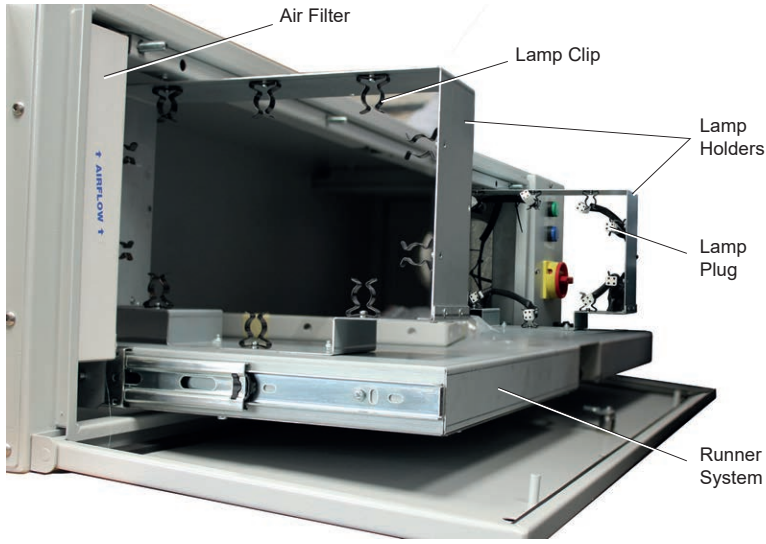


Figure 28 - Lamp Holder and Runner System

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, alternaitvely 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.

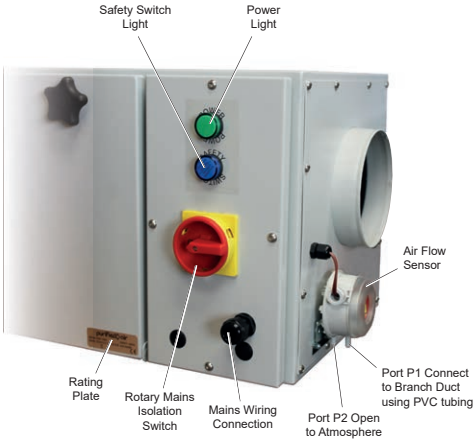


Figure 33 - UV-O 1000 Control Panel

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.

	Frequency	
Basic Maintenance Activities	**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	

	Frequency	
Basic Maintenance Activities	**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

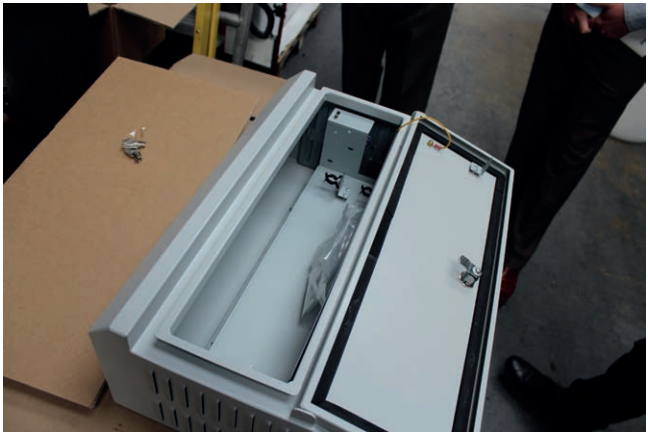


Figure 35 - UV-O 500 Lamp Clips

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.

Appendix V UV Ozone filter – Tech Sheet

UV-O Range

Unlike other UV-C systems, our UV-O units are located outside of the kitchen extract duct and are connected via a spigot and spiral ducting.



KEY FEATURES

- Easy to install
- Can be retro-fitted into existing duct
- Virtually no pressure loss
- No monthly maintenance needed

Our UV-O range includes:-

- **UV-O 500 which handles up to 1 m^3/sec of air flow**
- **UV-O 1000 which handles up to 2 m^3/sec of air flow**

The UV-O 500 has been designed for smaller capacity commercial kitchens.

The UV-O range uses UV-C technology to produce ozone and hydroxyl free radicals to oxidise cooking odours through a process of ozonolysis.

Unlike other UV-C systems, our UV-O units are located outside of the kitchen extract duct and are connected via a spigot and small diameter ducting.

Although it is widely accepted that the best way to apply UV-C light is directly in-line with the air stream itself, performance will be impacted as the lamps get dirty.

With our UV-O units the air flow does not come from the exhaust duct but from the ambient air around the unit, which is filtered on entry. This means that it is able to provide a uniform supply of ozone and hydroxyl free radicals into the extract system with an extremely low pressure loss.

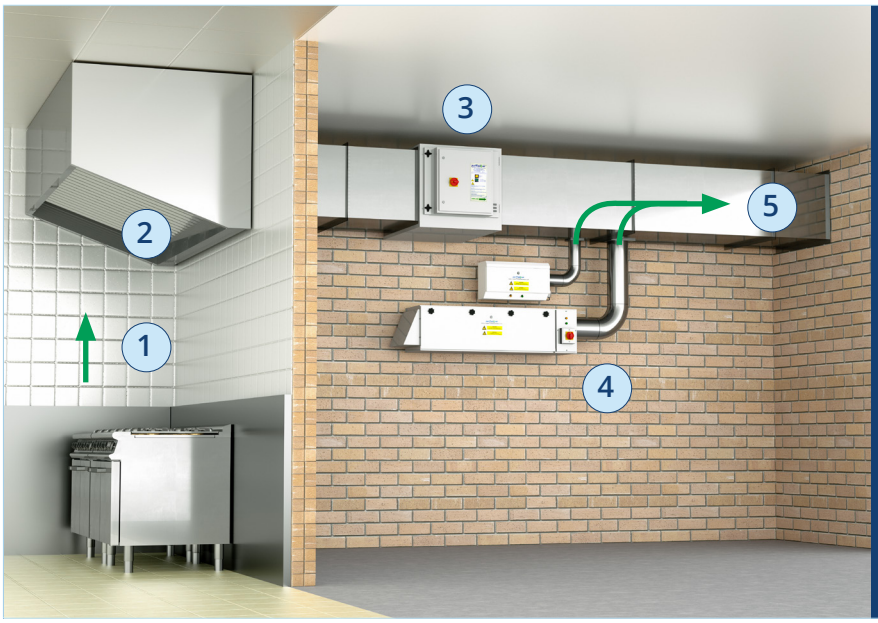
For optimum performance we would recommend between 2 & 6 seconds of dwell time to allow the ozone to work effectively upon the malodorous gasses within the duct.



UV-O 500 Unit



UV-O 1000 Unit



1. Cooking particulates and odours
2. Canopy Grease Filter
3. ESP - Particulate Control Unit
4. UV-O 500 (above)
   UV-O 1000 (below)
   Odour Control Units
5. Ozone joins airflow

Technical Specification

	UV-O 500	UV-O 1000
Electrical Supply	220/240V 50Hz	220/240V 50Hz
Power Consumption	140 Watts	700 Watts
Max Air Volume	up to 1m³/sec	up to 2m³/sec
Dimensions	W 605mm H 300mm D 200mm	W 1568mm H 350mm D 363mm
Weight	10.5Kg	50Kg

This unit's tried and tested UV-C technology allows for the siting of commercial kitchens in locations such as residential areas and shopping centres, where previously planning permission may not have been granted. After extensive research and development Purified Air are able to devise the best combination of lamps to provide the most effective odour control.

Safety

Ultra-Violet band C light is the most powerful of the three bands, it is a very strong oxidant and as such exposure to UV-C light is dangerous. To ensure safety the UV-C lamps are secured behind locked panels and the system has been engineered to shut down automatically when these panels are unlocked. However, since the lamps typically have a minimum life of twelve months and with the system able to operate at optimum efficiency even if one lamp fails it is unlikely that, apart from routine servicing by experienced engineers, that the system will ever need to be opened.

purified air® since 1984

Purified Air Limited, Lyon House, Lyon Rd, Romford, Essex RM1 2BG England
T: 01708 755 414 | F: 01708 721 488
enq@purifiedair.com | www.purifiedair.com

Appendix VI Purified Air UVO500 & UVO1001 UV Ozone Filter Technical Operation Manual

purified air®
since 1984

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.

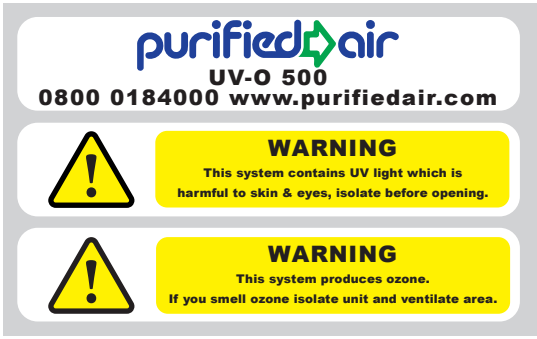


Figure 1 - UV-O 500 Unit Label

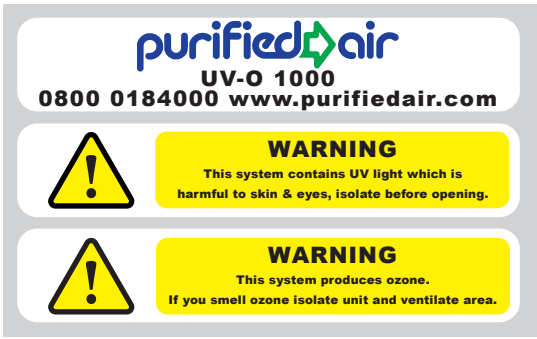


Figure 2 - UV-O 1000 Unit Label

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 (O_3) 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 negetive 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).

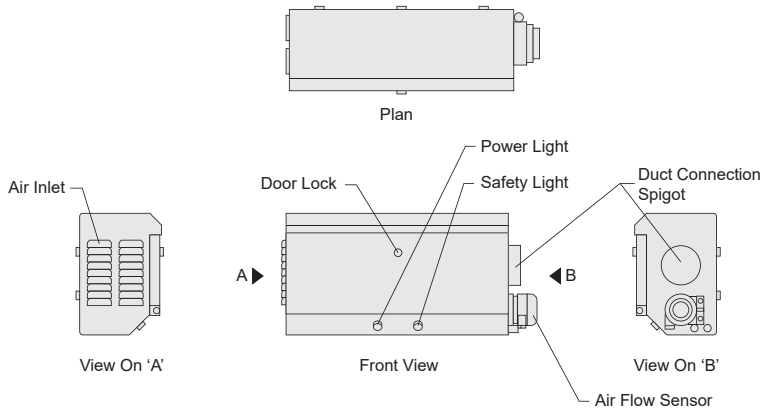


Figure 7 - UV-O 500 - Views



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).

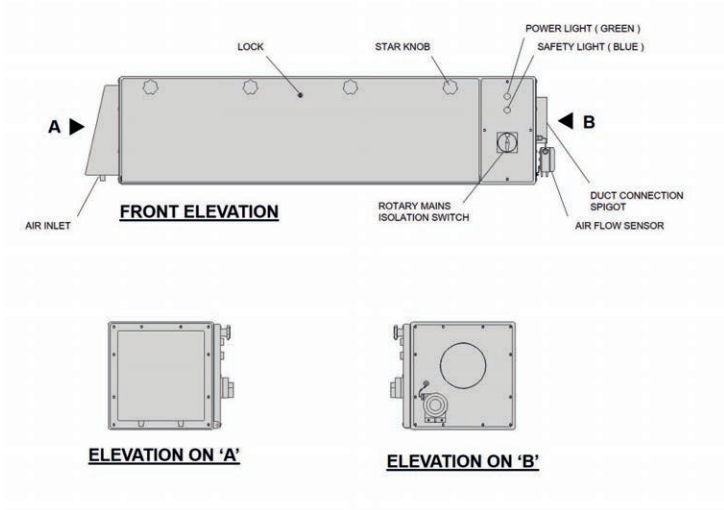


Figure 10 - UV-O 1000 - Front and Side Views



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

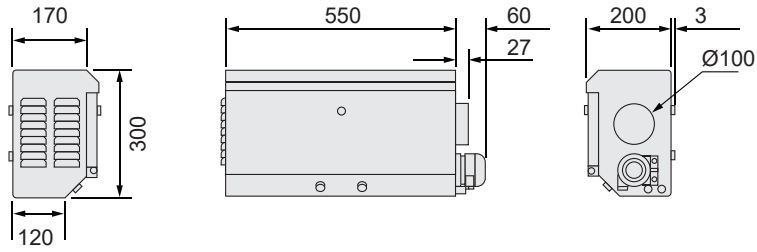


Figure 13 - UV-O 500 - Dimensions
(All Dimensions in Millimetres)

4.2.2 UV-1000 Unit Dimensions

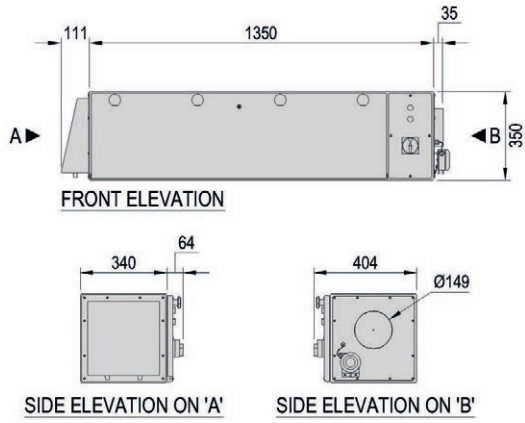


Figure 14 - UV-O 1000 - Dimensions
(All Dimensions in Millimetres)

4.3 Installing the UV-O 500 Unit

4.3.1 Installing the UV-O 500 Main Chassis

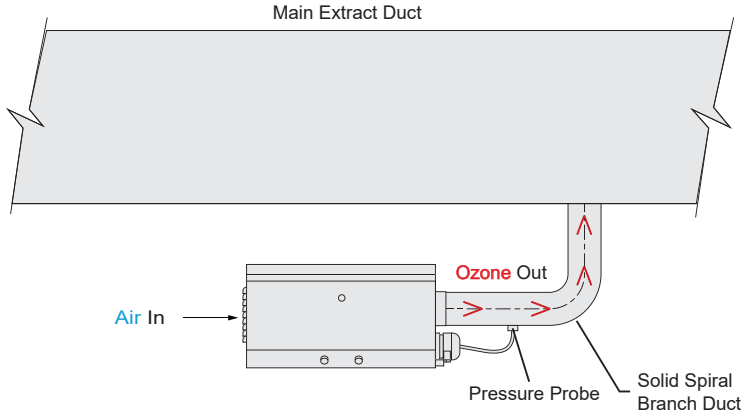


Figure 15 - UV-O 500 Installation Schematic

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.

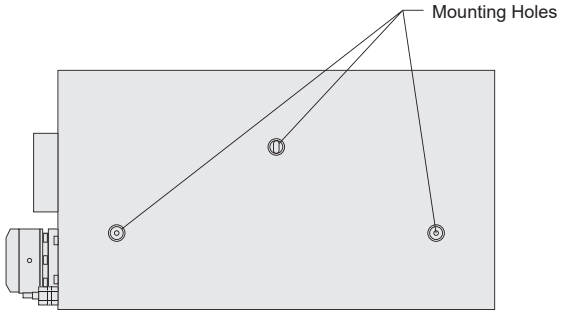


Figure 16 - UV-O 500 Mounting Holes

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).

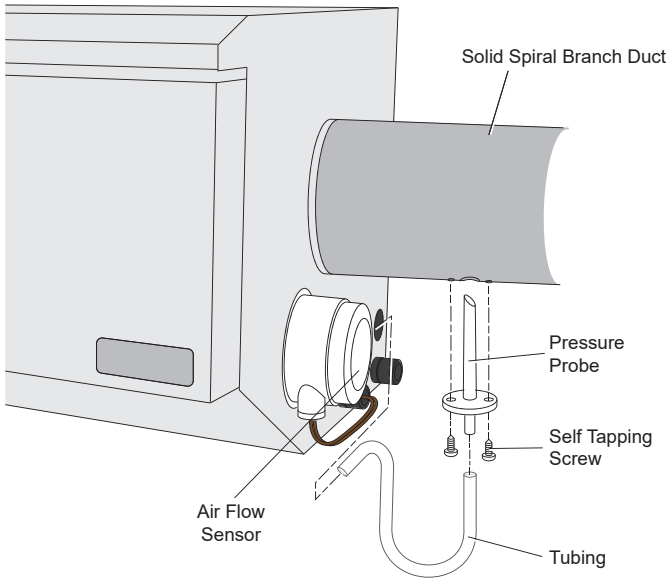


Figure 18 - Installing the Air Flow Sensor's Pressure Probe

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):

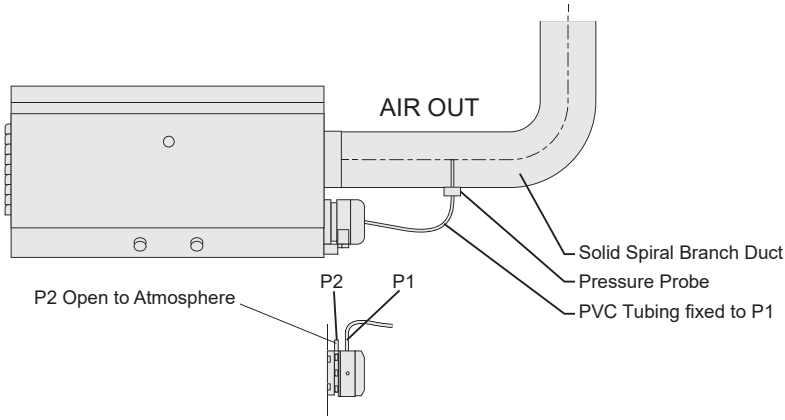


Figure 19 - Connecting the Air Flow Sensor's Pressure Probe

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

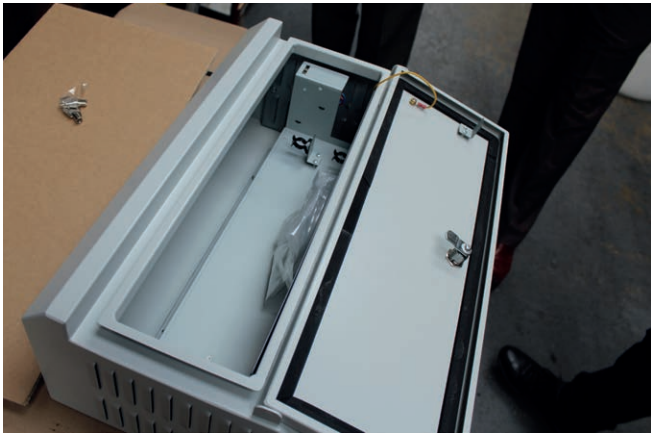


Figure 21 - UV-O 500 UV Lamp Location

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:

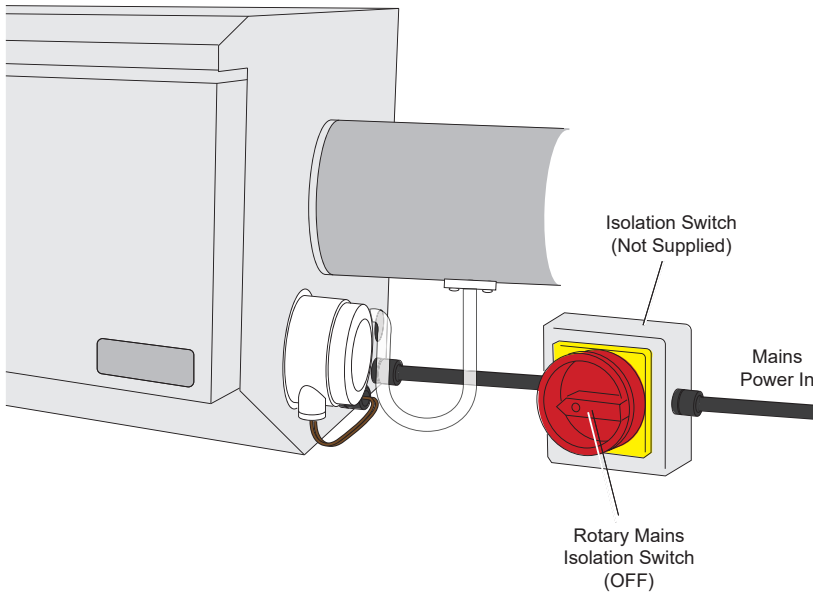


Figure 22 - Installation of Rotary Mains Isolation Switch

- 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

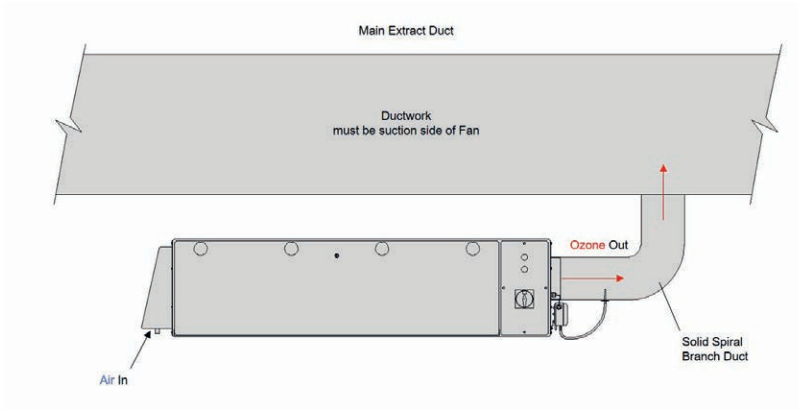


Figure 24 - UV-O 1000 Installation Schematic

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:

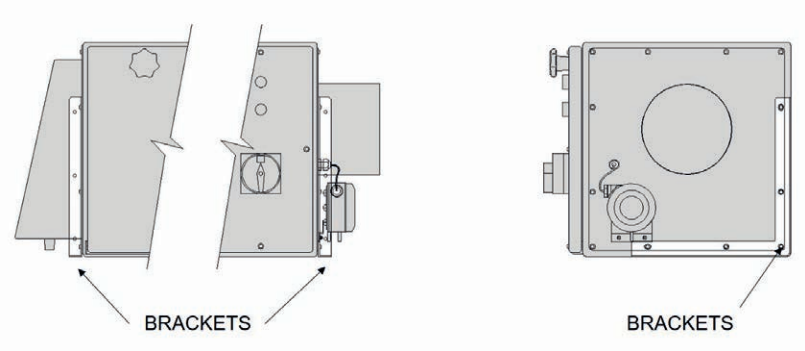


Figure 25 - UV-O 1000 Mounting Bracket Installation

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).

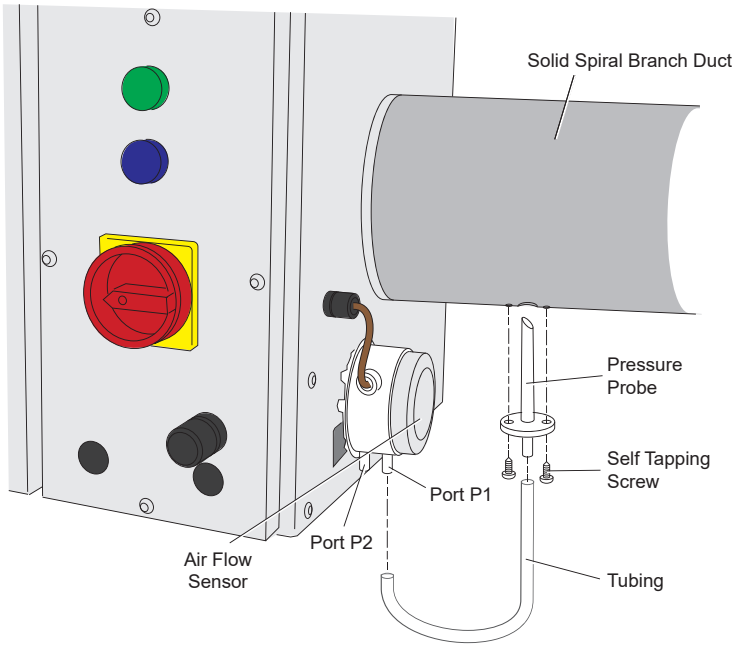


Figure 27 - Installing the Air Flow Sensor's Pressure Probe

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

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:

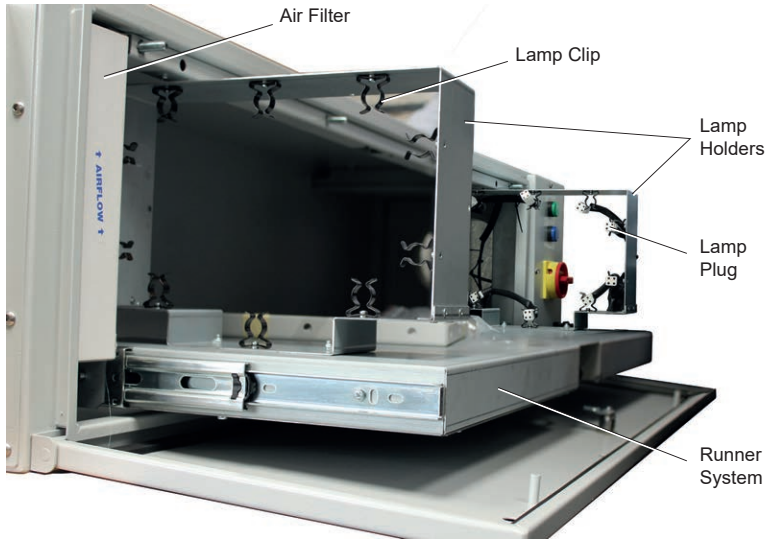


Figure 28 - Lamp Holder and Runner System

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, alternaitvely 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.

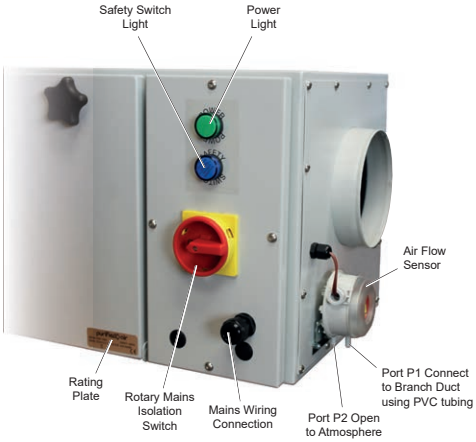


Figure 33 - UV-O 1000 Control Panel

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.

	Frequency	
Basic Maintenance Activities	**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	

	Frequency	
Basic Maintenance Activities	**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

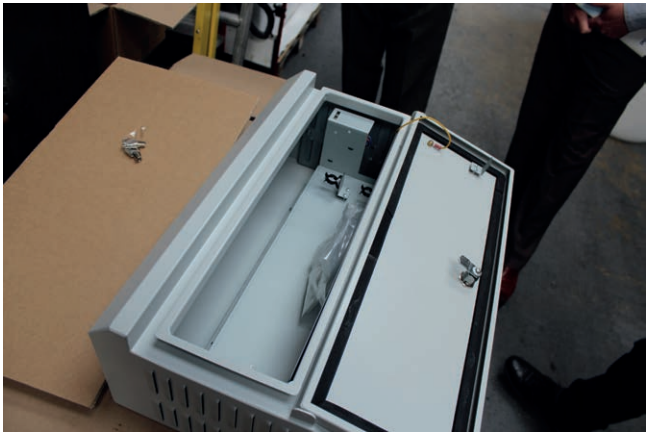


Figure 35 - UV-O 500 Lamp Clips

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

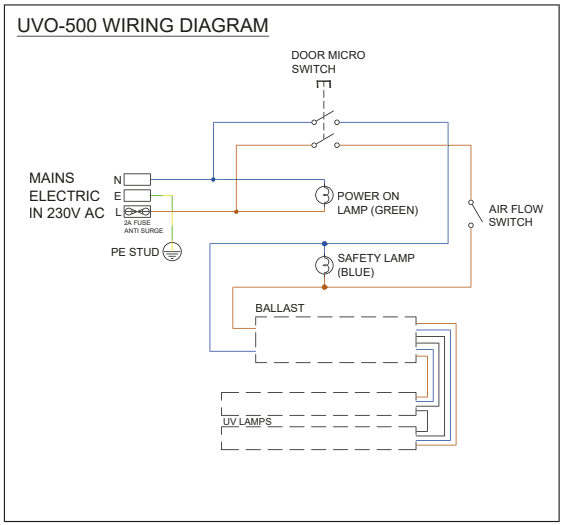


Figure 37 - UV-500 Unit Wiring Diagram

9.2 UVO 500 BMS

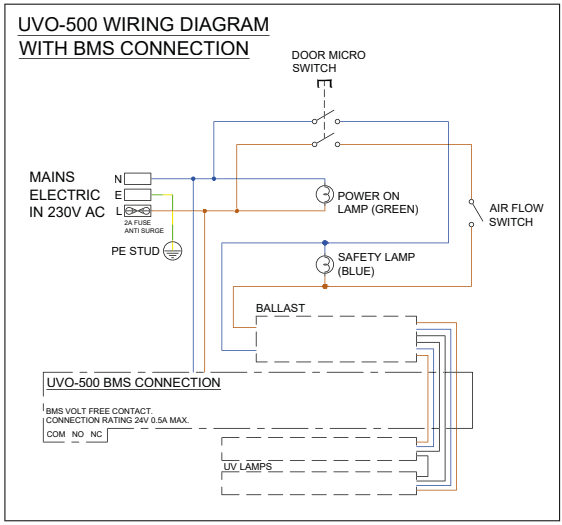


Figure 38 - UV-500 BMS Unit Wiring Diagram

9.3 UV-O 1000

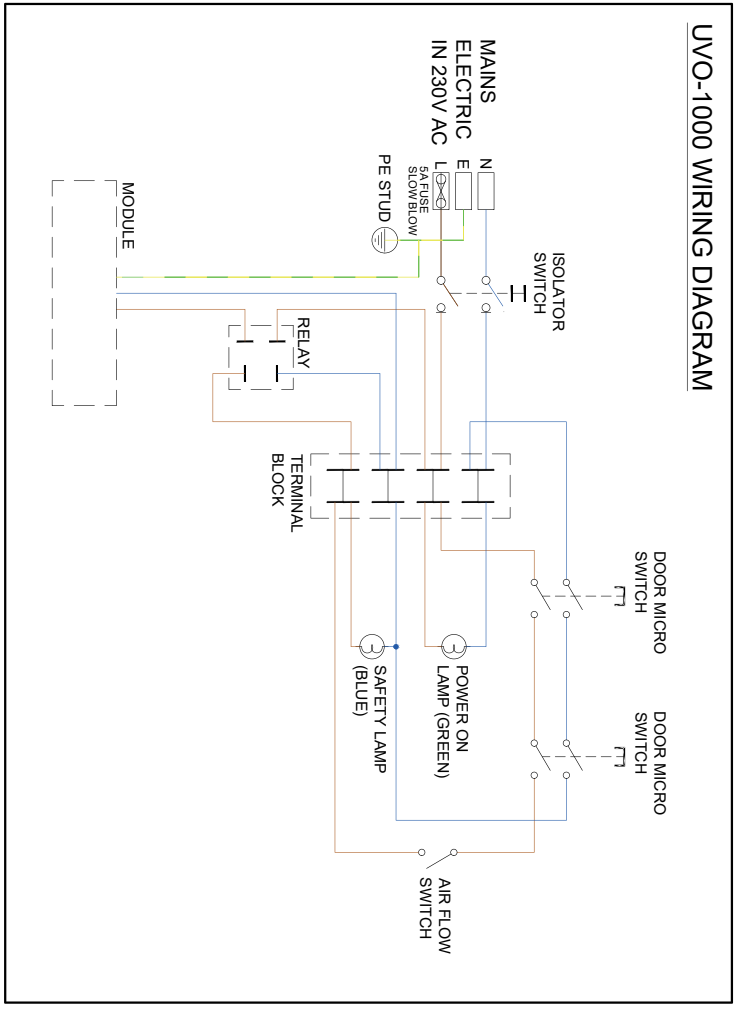


Figure 39 - UV-O 1000 Unit Wiring Diagram

9.4 UV-O 1000 BMS

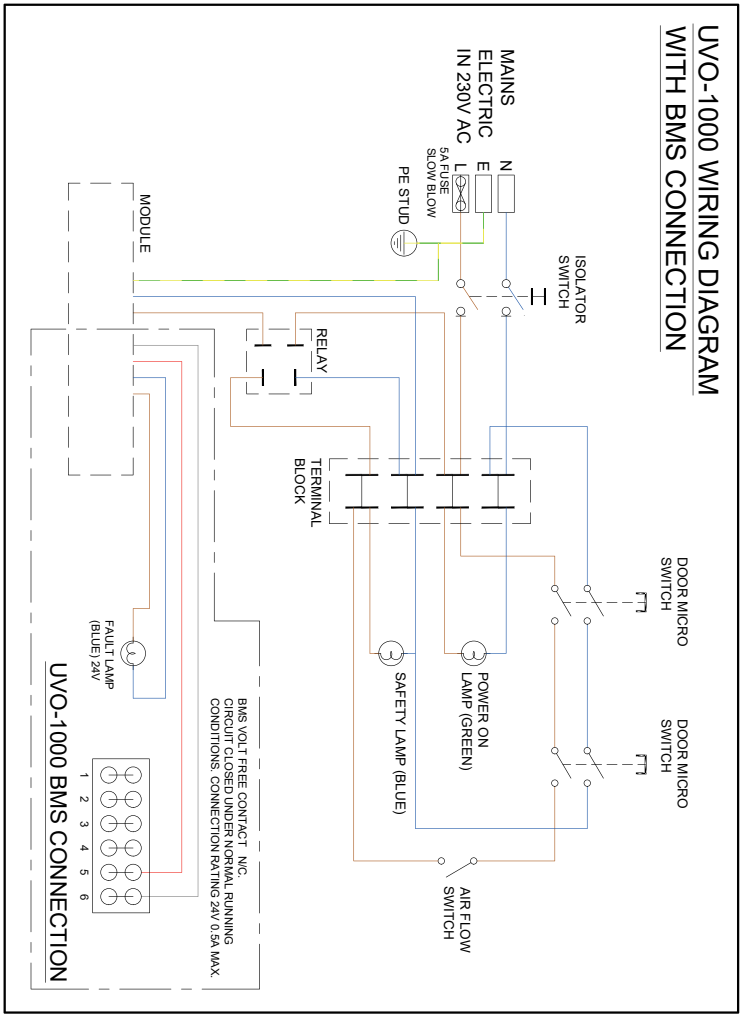


Figure 40 - UV-O 1000 BMS Unit Wiring Diagram

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 instllations 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

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

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	*UV-C Odour Control*		
Make/Brand	*PurifiedAir*		
Model reference	*UVO 500*	*UVO 1000*	
	UVC 1500	*UVC 3000*	*UVC 4500*

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



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

Edition 1

Appendix VII BDP basebuild Ventilation Schematic

BUILDING DESIGN PARTNERSHIP SHALL HAVE NO RESPONSIBILITY FOR ANY USE MADE OF THIS DOCUMENT OTHER THAN FOR THAT WHICH IT WAS PREPARED AND ISSUED.

ALL DIMENSIONS SHOULD BE CHECKED ON SITE.

DO NOT SCALE FROM THIS DRAWING

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- THE CDM DESIGN ISSUES REGISTER
- THE BDP RISK SERIES OF DRAWINGS
- THE PROJECT CDM RISK REGISTER

NOTES

1. DO NOT SCALE FROM THE DRAWING, WORK TO FIGURED DIMENSIONS ONLY.
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3. FOR ALL ACOUSTIC MATTERS RELATED TO THE VENTILATION REFER TO MF-LAV-XX-XX-RP-XA-01-016 FOR INSTALLATION DETAILS.
4. ALL EXTERNAL LOUVRES AND EXTERNAL DUCT TERMINATIONS (SUCH AS FRESH AIR INLETS) FOR VENTILATION PURPOSES, REQUIRE BIRD MESH NO COARSER THAN 12mm, AS INDICATED WITHIN THE MECHANICAL SPECIFICATION.
5. INLET/DISCHARGE PLENUMS BETWEEN THE EXTERNAL ACOUSTIC WALL AND THE ATTENUATOR BOXES ARE TO BE ACOUSTICALLY TREATED WITH MINERAL WOOL LAGGING AND HIGH MASS PROTECTIVE ENCLOSURE – EG TWO SHEETS OF PLASTERBOARD OR EQUIVALENT. WHERE EXTERNAL THE WHOLE SHALL BE WEATHERED.
6. DUCTWORK BETWEEN AHUS / FANS AND ATTENUATORS TO BE ACOUSTICALLY LAGGED AND TREATED WITH A HIGH MASS PROTECTIVE ENCLOSURE TO PREVENT NOISE BREAKOUT THROUGH DUCT.
7. DUCT PENETRATIONS THROUGH ACOUSTIC WALLS TO BE FITTED WITH ATTENUATORS, LAGGING AND HIGH MASS PROTECTIVE ENCLOSURE.
8. MAIN HEADER DUCTWORK RUNNING ABOVE OCCUPIED SPACES SHALL BE ACOUSTICALLY LAGGED.
9. DUCTWORK TO BE THERMALLY INSULATED AS INDICATED WITHIN THE MECHANICAL SPECIFICATION.
10. SMOKE AND / OR FIRE DAMPERS TO BE PROVIDED WHERE DUCTS PASS THROUGH CAVITY BARRIERS / FIRE COMPARTMENTATION AS INDICATED ON SCHEMATICS AND LAYOUTS.
11. DUCTWORK RUNNING THROUGH HAZARD ROOMS TO HAVE FIRE RESISTANCE AS INDICATED ON LAYOUTS.
12. DUCT ACCESS PANELS FOR CLEANING PURPOSES SHALL BE PROVIDED TO SUIT ACCESS REQUIREMENTS TO ALL CEILING MOUNTED EQUIPMENT / DAMPERS ETC.
13. WHERE POSSIBLE, SERVICES REQUIRING MAINTENANCE, OR USED FOR COMMISSIONING PURPOSES SHALL BE KEPT TO ABOVE ACCESSIBLE CEILINGS.
14. FINAL POSITION OF ALL CEILING MOUNTED GRILLES AND DIFFUSERS TO BE INDICATED ON ARCHITECTS REFLECTED CEILING PLANS.
15. ALL FINAL FLEXIBLE CONNECTIONS TO GRILLES TO BE NO MORE THAN 500mm LONG AND ELECTRICALLY BONDED.
16. ALL GRILLES WITHIN PLASTERBOARD CEILINGS TO BE PROVIDED C/W OPPOSED BLADE DAMPERS TO LIMIT REQUIREMENT OF VCD'S ABOVE PLASTERBOARD CEILINGS.
17. ALL GRILLE POSITIONS SHOWN ARE INDICATIVE. FINAL LOCATIONS TO BE BY M&E CONTRACTOR.
18. ALL FAN COIL UNIT RETURN AIR PLENUMS SHALL BE ACOUSTICALLY LINED.
19.
20.
21. ALL DUCTWORK IS TO BE DESIGNED TO DW144 AND TO DW172 FOR THE KITCHEN SYSTEMS.
22. THE CONTRACTOR SHALL DESIGN ALL SUPPORTS FOR THE DUCTWORK SYSTEM TO ISOLATE THE DUCTWORK FROM THE STRUCTURE SO AS NOT TO TRANSMIT VIBRATIONS FROM THE EXTERNAL SKIN TO THE INTERNAL SKIN OR BETWEEN SEPARATE VIBRATION ISOLATED AREAS OF THE FABRIC.
23. ALLOW FOR ALL FIRE DAMPERS IN FLOOR SLABS AND FIRE RATED WALLS. SEE SCHEMATIC FOR DAMPERS ETC.
24. HANGERS TO BE ISOLATED FROM VIBRATION OFF THE UNDERSIDE OF THE SLAB. VIBRATION ISOLATION TO BE IN ACCORDANCE WITH LEVEL ACOUSTIC REPORT.

Rev	Description	By	Check	Date
C17	CONTRACT ISSUE	JA	AM	17.02.23
C16	CONTRACT ISSUE	AM	AM	07.07.22
C15	CONTRACT ISSUE	MD	AM	28.01.22
C14	CONTRACT ISSUE	AM	GF	20.12.21
C13	CONTRACT ISSUE	CM	AM	27.08.21
C12	CONTRACT ISSUE	CM	AM	19.07.21
C11	CONTRACT ISSUE	CM	AM	30.11.20
C10	CONTRACT ISSUE	CM	AM	09.10.20
C09	CONTRACT ISSUE	CM	AM	04.09.20
C08	CHANGES DUE TO UPDATE IN FIRE STRATEGY	JL	AM	04.04.20
C07	CONTRACT ISSUE ADDENDUM	JL	AM	06.03.20
C06	CONTRACT ISSUE ADDENDUM	JL	AM	28.02.20
C05	CONTRACT ISSUE ADDENDUM	JL	AM	14.02.20
C04	CONTRACT ISSUE ADDENDUM	JL	AM	05.02.20
C03	CONTRACT ISSUE ADDENDUM	JL	AM	28.11.19
C02	COMMENTS INCORPORATED	JL	AM	16.10.19
C01	CONTRACT ISSUE	JL	AM	16.08.19

The design illustrated upon this drawing has been coordinated with the following discipline models:

REV	DATE RECEIVED	RECEIVED FROM	INITIAL NAME
A	30/11/2021	OMA	MF-OMA-XX-XX-M3-A-00-0001 (F59)
S	07/10/2021	Buro Happold	MF-BHE-XX-XX-M3-S-00-002 (F148)
Y	07/10/2020	Charcoal Blue	MF-CBL-XX-XX-M3-Y-01-0001 (F56)
A	02/11/2022	Ryder	MF-RYD-XX-XX-M3-A-00-0001

CLIENT
MANCHESTER CITY COUNCIL
Albert Square, Town Hall,
M2 5DB, Manchester
United Kingdom

T +44 (0) 161 234 5004

BDP.
11 Ducie Street
PO Box 85
Piccadilly Basin
Manchester
M60 3JA
United Kingdom

T +44 (0)161 828 2200
www.bdp.com

DRAWING STATUS
Contract

PROJECT
P2008093
Manchester Factory

DISCIPLINE
Mechanical Engineering Services

DRAWING TITLE
Warehouse
Schematic
Ventilation and Air Conditioning Systems

PROJECT LEAD	DRAWN	DATE FIRST ISSUED	SCALE	@ A0
CC	AM	27/06/2018	NTS	

DRAWING NO. — REVISION
MF-BDP-WH-XX-DR-M-65-0102 — C17

C13 AMENDMENTS
1. ADDED FD-WH-02-15/16/17/18
2. ADDED FD-WH-03-01/02
3. DELETED FD-WH-00-04
4. UPDATED CROSHAIRS TO MATCH THE DESIGN UPDATE DRAWINGS

C14 AMENDMENTS
1. DUCT SIZES CORRECTED STORAGE BUFFER.
2. DUCT SIZE TRANSITION POINT SHOWN IN KITCHEN SUPPORT
3. KITCHEN EXTRACT FIRE RATING UPDATED
4. FD-WH-02-09 AND DUCT AMENDED TO 700 X 800
5. DUCT SIZE CORRECTED FROM 0 X 0 TO 2000IA ADJACENT CAV-WH-04-20

C15 AMENDMENTS
1. OMIT DAMPERS FD-WH-00-14 & 15, FD-WH-02-02,04,07,08,15 & 16, FD-WH-03-01
2. AMEND DUCT SIZES TO MATCH CHT WORKING DRAWINGS
3. DROP DUCT AND DAMPER SIZES TO FIT THROUGH OR BELOW CASTELLATED BEAM FIRE STOPPING.
4. ROTATE DAMPERS FD-WH-00-07 AND 11 90 DEGREES

C16 AMENDMENTS
1. CHANGE SIZE AND LOCATION AT ATG-WH-00-01 TO 06 IN ARCHES.
2. CHANGE DUCT SIZE IN MECH RISER 01A
3. CHANGE FIRE DAMPER FD-WH-04-13 TO 400 x 150 AND FD-WH-04-14 TO 160 DIA
4. ADD BACK FD-WH-04-03 PREVIOUSLY OMITTED AND AMEND DUCTWORK IN CEILING VOID OF SHOWER/WC 417

C17 AMENDMENTS
1. ADD MINIMAX CROSS HAIRS FOR COMMISSIONING
2. ADJUST DUCTS TO MATCH CHT DRAWINGS
3. DELETE MOTORISED DAMPERS IN WORKSHOP

C04 AMENDMENTS
1. ALTERED AHU L3-01 CONNECTIONS AND PLENUMS
2. REARRANGED RISERS TO MOVE LEVEL 3 AND 4 DUCTS OUT OF MECH 2
3. REARRANGED BUFFER STORAGE AREA DUCT TO BE CLEARER
4. REDUCED MAKE UP AIR VOLUME TO BUFFER STORE
5. SHOWN KITCHEN EXTRACT TO GREEN ROOM.
6. ADDED EXTRACT GRILLE 18A TO CUPBOARD IN RM 409 NORTH TOWER
7. KITCHEN EXTRACT UPGRADED TO 90 MINUTE FIRE INTEGRITY, INSULATION AND STABILITY FROM 1 HOUR.
8. RENAMED ONE SECURITY ROOM TO STAGE MANAGERS OFFICE

C07 AMENDMENTS
1. KITCHEN EXTRACT DUCTWORK TO HAVE 120 MIN FIRE RATED INSULATION.

C08 AMENDMENTS - ARISING FROM FIRE STRATEGY REV 03
1. SUPPLY AIR DUCTED TO ACCESSIBLE WCS
2. MOTORISED FIRE SMOKE DAMPERS IN CENTRAL CORE REVERT TO FUSIBLE LINK FIRE DAMPERS

C09 AMENDMENTS
1. UPDATED CROSSHAIRS
2. ROOM REFERENCES UPDATED TO OMA FF&E
3. UPDATED AIRFLOWS FOR TOILETS IN THE ARCHES
4. UPDATED DUCT SIZE FOR KITCHEN EXTRACT

C10 AMENDMENTS
1. ARCHES AIR TRANSFER GRILLES LOCATED IN ARCHES 6 AND 7 ONLY
2. REDUCED GENERAL EXTRACT FROM KITCHEN
3. ADDED ATTENUATORS AND NOTATION TO GREEN ROOM KITCHEN EXTRACT FAN
4. ADDED CAV-WH-04-25 TO DRESSING ROOM 407
5. UPDATED CROSSHAIRS
6. ADDED FLOOR LEVEL INTO EQUIPMENT REFERENCES
7. UPDATED NOTES

C11 AMENDMENTS
1. CAV/ VAV REFERENCES UPDATED
2. VCDS ADDED
3. KITCHEN EXTRACT TO GREEN ROOM IN ABEYANCE

C12 AMENDMENTS
1. UPDATED CROSSHAIRS
2. INCORPORATE CHANGES FOLLOWING REVIEW OF DAMPER CE MARKINGS
3. UPDATED FOR UCE 086(2)

00 - Ground Floor

05 - Fifth Floor

04 - Fourth Floor

03 - Third Floor

02 - Second Floor

Floor

RUN GAS AS PIPE IN PIPE IN THE RISER

Refer to Schematic MF-BDP-WH-XX-DR-M-65-0103 for continuation. A

B Refer to Schematic MF-BDP-WH-XX-DR-M-65-0103 for continuation.

MECH RISER 01

MECH RISER 02

KITCHEN EXTRACT TO BE 90 MINUTE FIRE RATED DUCTWORK THROUGH TO ROOF

DUCT TO SET DOWN TO INSTALL FIRE DAMPER BELOW CASTELLATED BEAM CLADDING

DUCTS AND DAMPERS TO SET DOWN LOCALLY BELOW THE CASTELLATED BEAM AND FIRE CLADDING

CONTROL BY HIGHEST LEVEL OF CO_2 IN DRESSING ROOMS

CONTROL BY HIGHEST LEVEL OF CO_2 IN DRESSING ROOMS

CONTROL BY HIGHEST LEVEL OF CO_2 IN DRESSING ROOMS

EXTRACT DUCT CHANGED LOCALL TO FIT BELOW THE NEW STEELWORK SUPPORT RAILS

Refer to Schematic MF-BDP-WH-XX-DR-M-65-0103 for continuation. C

DAMPERS TO BE POSITIONED IN BULKHED AWAY FROM CASTELLATED BEAM

DUCT AND DAMPER TO SET DOWN LOCALLY BELOW THE CASTELLATED BEAM AND FIRE CLADDING

TO DISCHARGE THROUGH COWL AT HIGH LEVEL OVER PLANT DECK

1 HOUR FIRE RATED DUCT THROUGH THE WALL AND FOR FIRST 500mm AFTER THE EXTERNAL WALL.

MATCH SUPPLY LEVEL IN GREEN ROOM. REDUCE BY 120 L/S WHEN KITCHEN EXTRACT IS RUNNING

KITCHEN EXTRACT

SUPPLY PLENUM

1400x500

RETURN PLENUM

PLANT DECK

CO_2 IN LOADING BAY

CO_2 IN LOADING BAY

EXTERNAL KITCHEN EXTRACT DUCT TO BE 60 MINUTE FIRE RATED DUCTWORK BETWEEN MECH RISER 01 & 01A

CONTROL BY CO_2 IN GREEN ROOM

REDUCE TO 400 X 250 1 HR FIRE RATED DUCT THROUGH 30 MINUTE FIRE WALL AND BACK TO 400 X 300 ON TO FD-WH-03-02

850mm x 600mm

MECH RISER TO BE VENTILATED AT LOW AND HIGH LEVEL FOR GAS MAIN TO KITCHEN

transitions at this bend to 850mm x 600mm

CONTROL BY CO_2 LEVEL IN WORKSHOP

CONTROL TO MATCH SUPPLY LESS 103 L/S

TRANSITION UP 1200 X 1200 ATTENUATOR AND DOWN TO 1100 X 1000 FIRE DAMPER

TRANSITION UP AND DOWN TO 1425 X 1725 ATTENUATOR

ACOUSTIC BARRIER

INSTALL ACOUSTIC INSULATION AND ACOUSTIC MASS BARRIER TO MATCH THE PERFORMANCE OF THE ACOUSTIC PANEL PENETRATED BY THE 3 GRILLES.

KITCHEN EXTRACT TO BE 90 MINUTE FIRE RATED DUCTWORK.

CONTROL AS:-
1) MINIMUM FOR FOYER 1502 L/S
2) KITCHEN EXTRACT LOW SPEED - 3410 L/S (SUBJECT TO CATERING EXTRACT VENT DESIGN)
3) KITCHEN EXTRACT HIGH SPEED (LINKED TO KITCHEN EXTRACT CONTROLS) MAX 5000 L/S

CONTROL AS:-
1) MINIMUM FLOW 811 L/S
2) KITCHEN EXTRACT LOW SPEED - 1175 L/S (SUBJECT TO CATERING EXTRACT VENT DESIGN)
3) KITCHEN EXTRACT HIGH SPEED MAX 1650 L/S

FD-WH-00-06, 07,10 AND 11 TO BE 1000 X 750

ATGs stacked ATG-WH-GF-02, 04 & 06

ATGs stacked ATG-WH-GF-01, 03 & 05

MIN 125 L/S MAKE UP 62.5 L/S LOW LEVEL AND 62.5 L/S HIGH LEVEL

1970 L/S MAKE UP AIR 985 L/S LOW LEVEL 985 L/S HIGH LEVEL

MIN 125 L/S MAKE UP 62.5 L/S LOW LEVEL AND 62.5 L/S HIGH LEVEL

1970 L/S MAKE UP AIR 985 L/S LOW LEVEL 985 L/S HIGH LEVEL

KITCHEN EXTRACT TO BE DESIGNED WHEN CATERER IS APPOINTED. ALLOWED FOR 4m³/s

TOTAL EXTRACT FROM KITCHEN 4000 CANOPIES 200 GENERAL 50 STAFF AREA =4250

KITCHEN SUPPORT

VENTILATION TO KEEP TRANSFORMERS FROM OVERHEATING SUPPLEMENTED BY DX COOLING WHEN TEMPERATURE IN THE TX ROOM EXCEEDS 35°C

STAFF OFFICES AND TOILET

ARCH 08 007

ARCH 07 008

ARCH 06 009 & 010

ARCH 05 011 & 012

MAIN FOYER 004

STORAGE BUFFER

KITCHEN/PREP

TOILET CORRODOR 305

DIS WC 303

KITCHEN 306

GREEN ROOM 302

LOADING BAY 215

STAGE MANAGERS OFFICE 216

SECURITY 218

DIS WC 219

CLEANING ST. 207

DIS WC 214

DIS WC 209

DIS WC 208

EQUIPMENT ROOM 206

WORKSHOP 204

ELECTRICAL SWITCHGEAR AND TRANSFORMER ROOM 002

LOUNGE 415

DRESSING ROOM 425

BATHROOM 422

SOLIST ROOM 426

SOLIST ROOM 424

SOLIST ROOM 423

DRESSING ROOM 421

SHOWER/WC 416

DRESSING ROOM 418

SHOWER/WC 417

DRESSING ROOM 419

DRESSING ROOM 407

DRESSING ROOM 406

DRESSING ROOM 405

DRESSING ROOM 404

SHOWER/WC 408

SHOWER/WC 420

SHOWER/WC 409

LOUNGE 402

SHOWER/WC 403

COSTUME/LAUNDRY 413

DIS WC 412

L11

L10

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10. SMOKE AND / OR FIRE DAMPERS TO BE PROVIDED WHERE DUCTS PASS THROUGH CAVITY BARRIERS / FIRE COMPARTMENTATION AS INDICATED ON SCHEMATICS AND LAYOUTS.
11. DUCTWORK RUNNING THROUGH HAZARD ROOMS TO HAVE FIRE RESISTANCE AS INDICATED ON LAYOUTS.
12. DUCT ACCESS PANELS FOR CLEANING PURPOSES SHALL BE PROVIDED TO SUIT ACCESS REQUIREMENTS TO ALL CEILING MOUNTED EQUIPMENT / DAMPERS ETC.
13. WHERE POSSIBLE, SERVICES REQUIRING MAINTENANCE, OR USED FOR COMMISSIONING PURPOSES SHALL BE KEPT ABOVE ACCESSIBLE CEILINGS.
14. FINAL POSITION OF ALL CEILING MOUNTED GRILLES AND DIFFUSERS TO BE INDICATED ON ARCHITECTS REFLECTED CEILING PLANS.
15. ALL FINAL FLEXIBLE CONNECTIONS TO GRILLES TO BE NO MORE THAN 500mm LONG AND ELECTRICALLY BONDED
16. ALL GRILLES WITHIN PLASTERBOARD CEILINGS TO BE PROVIDED CW OPPOSED BLADE DAMPERS TO LIMIT REQUIREMENT OF VCD'S ABOVE PLASTERBOARD CEILINGS.
17. ALL GRILLE POSITIONS SHOWN ARE INDICATIVE. FINAL LOCATIONS TO BE BY M&E CONTRACTOR.
18. ALL FAN COIL UNIT RETURN AIR PLENUMS SHALL BE ACOUSTICALLY LINED.
19.
20.
21. ALL DUCTWORK IS TO BE DESIGNED TO DW144 AND TO DW172 FOR THE KITCHEN SYSTEMS.
22. THE CONTRACTOR SHALL DESIGN ALL SUPPORTS FOR THE DUCTWORK SYSTEM TO ISOLATE THE DUCTWORK FROM THE STRUCTURE SO AS NOT TO TRANSMIT VIBRATIONS FROM THE EXTERNAL SKIN TO THE INTERNAL SKIN OR BETWEEN SEPARATE VIBRATION ISOLATED AREAS OF THE FABRIC.
23. ALLOW FOR ALL FIRE DAMPERS IN FLOOR SLABS AND FIRE RATED WALLS. SEE SCHEMATIC FOR DAMPERS ETC.
24. HANGERS TO BE ISOLATED FROM VIBRATION OFF THE UNDERSIDE OF THE SLAB. VIBRATION ISOLATION TO BE IN ACCORDANCE WITH LEVEL ACOUSTIC REPORT.

KITCHEN EXTRACT TO BE 90 MINUTE FIRE RATED DUCTWORK THROUGH TO ROOF

BOILER FLUE RISES TO ROOF

BOILER FLUE DUCT TO HAVE 90 MIN FIRE RATED CHECK PLATE

MECH RISER 01

MECH RISER 02

DUCT DROP TO 750 X 250 THROUGH BEAM AND BULKHEAD . DAMPER TO MOVE TO BULKHEAD

07 - Seventh Floor

06 - Sixth Floor

05 - Fifth Floor

04 - Fourth Floor

03 - Third Floor

MAX FACE VELOCITY 2.5m/s

900 x 600 LOUVRE

1800 x 600 LOUVRE

L12

L13

FAN-WH-LS-SF1 & SF2

BO-WH-LS-01A&01B

BO-WH-LS-02A&02B

PLANT ROOM 611

CREW ROOM 612

ELECTRICAL ROOM 707

CORRIDOR 709

TOILETS 709

CONTROL BY CO_2 LEVEL IN CORPORATE SPACE

CONTROL BY CO_2 LEVEL IN BOARD ROOM

CONTROL BY CO_2 LEVEL IN NORTH OFFICES

CONTROL BY HIGHEST CO_2 LEVEL IN SOUTH AND CENTRAL OFFICES

KITCHENETTE

BOARD ROOM 604

CORPORATE/EDUCATION SPACE 602

EXTERNAL PLANT AREA

1 HR FIRE RATED DUCTWORK FROM FD-WH-05-02 & 03 TO EXTEND TO 500mm BEYOND EXTERNAL CLADDING

NORTH MEETING ROOM 504

NORTH OFFICE 502

SOUTH OFFICE 502

SOUTH MEETING ROOM 509

CENTRAL OFFICE 502

COMMS 508

TOILETS 505

ACC WC 506

CORRIDOR 505

DUCT TO REDUCE TO 250 AND DROP BELOW FIRE CLADDING ON BEAM

COSTUME/LAUNDRY 410

TOILETS 411

ACC WC 412

CORRIDOR 411

Refer to Schematic MF-BDP-WH-XX-DR-M-65-0102 supply vent details.

AV RACK ROOM 307

Refer to Schematic MF-BDP-WH-XX-DR-M-65-0102 for continuation.

Refer to Schematic MF-BDP-WH-XX-DR-M-65-0102 for continuation.

C04 ADDENDA
1. PLENUMS ADDED TO BOILER VENT SYSTEM
2. BOILER FLUE SIZES ADDED
3. KITCHEN EXTRACT DUCT UPRATED TO 90 MINUTES
4. DUCT SIZES IN TOILET CORES AMENDED TO MATCH LAYOUTS
5. DAMPERS IN TOILET CORES CHANGED TO FIRE/SMOKE TYPE TO ALIGN WITH LATEST FIRE STRATEGY
6.REARRANGED GRILLES IN OPEN PLAN OFFICE TO REFLECT LAYOUT DRAWINGS
7.AMENDED DUCT SIZES IN LEVEL 5 NORTH OFFICE TO MATCH LAYOUT
8. ADDED ATT 39 TO AHU LS-01 SUPPLY DUCT
9. CHANGED DUCT CONFIGURATION OFF AHU TO SHOW PLENUMS AND TO REFLECT LATEST PROPOSAL FOR FEEDING LEVEL 05 NORTH OFFICE AND LEVEL 06 CORPORATE SPACE FROM PLENUM AND NOT THE RISER.
10. RISER MECH 02 ADJUSTED TO SHOW SUPPLY AND EXTRACT TO LEVEL 05 SOUTH AND CENTRAL OFFICE AND SUPPLY TO LEVEL 07 TOILET CORRIDOR

C07 AMENDMENTS
1. KITCHEN EXTRACT DUCTWORK TO HAVE 120 MIN FIRE RATED INSULATION.

C08 AMENDMENTS:
1. UPDATES FROM FIRE STRATEGY HAVE IMPACTED DUCTWORK SIZES.
2. FIRE DAMPERS HAVE BEEN PROVIDED IN THE CORE OF THE WAREHOUSE IN LIEU OF MOTORISED FIRE SMOKE DAMPERS .

C09 AMENDMENTS:
1. UPDATED CROSSHAIRS
2. AMEDED GRILLES WITH BELLMOUTHS IN ROOM 504 MEETING ROOM AND ROOM 509 MEETING ROOM
3. AMENDED AIR FLOWS IN ROOMS 611 PLANT ROOM; 606 CORRIDOR; 607 ACC WC; 604 BOARD ROOM
4. AMENDED EG WITH BELLMOUTH IN 604 BOARDROOM
5. UPDATED DUCT SIZE FOR KITCHEN EXTRACT

C10 AMENDMENTS:
1. FLOOR LEVELS HAVE BEEN ADDED TO THE EQUIPMENT REFERENCES
2. BOILER MAKE UP AIR EQUIPMENT INCREASED IN DUTY
3. CROSSHAIRS UPDATED
4. ATTENUATOR ATT-WH-05- 40S LOCATED ON OUTLET OF VAV-WH- 05-19
5. NOTES UPDATED

C11 AMENDMENTS:
1. VCDS ADDED WHERE NECESSARY
2. RETURN AIR DUCTS TO AHU-WH-LS-01 CROSSHAIRS ADJUSTED
3. VAV-WH-06-13 &14 AMENDED TO VAV-WH-05-13 & 14

C12 AMENDMENTS:
1. UPDATED CROSSHAIRS
2. UPDATED SCHEMATIC TO REFLECT LAYOUTS
3. INCORPORATE CHANGES FOLLOWING REVIEW OF DAMPER CE MARKINGS
4. UPDATED FOR UCE 086(2)

C13 AMENDMENTS:
1. MOVED VAV-WH-05-13 INTO LEVEL 05 CEILING VOID
2. MOVED VAV-WH-05-14 INTO LEVEL 06 PLANT DECK
3. ADDED FD-WH-06-09/10/11/12/13
4. ADDED FD-WH-05-02/03
5. UPDATED CROSHAIRS TO MATCH THE DESIGN UPDATE DRAWINGS

C14 AMENDMENTS
1. GENERAL DUCT ARRANGEMENTS MODIFIED TO MATCH CHT WORKING DRAWINGS.
2. REDUCE HEIGHT OF DAMPERS FD-WH-04-26 AND FD-WH-06-09
3. CMIT DAMPERS FD-WH-05-12 & 13 AND ADD 1 HOUR FIRE RATED DUCTWORK FROM FD-WH-05-02&03 TO 500mm BEYOND CLADDING

C15 AMENDMENTS:
1. ALTER DUCT ARRANGEMENT AND SIZE BETWEEN KITCHENETTE AND BOARDROOM LEVEL 06 TO DROP BELOW BEAM AND TERMINATE IN A NEW EXTRACT GRILLE EG-WH-06-81

C16 AMENDMENTS:
1. EXTRACT ADDED TO EQUIPMENT ROOM 608.

C17 AMENDMENTS
1. DUCT SIZES ADJUSTED TO MATCH CHT INSTALLATION
2. DIMENSION LINES, EXTENDED LEADERS AND MINOR ANOMALIES DELETED
3. MINIMUM FLOW RATES AND VELOCITIES ADDED TO CROSSHAIRS FOR COMMISSIONING PURPOSES

C17	CONTRACT ISSUE	RD	AM	17.02.23
C16	CONTRACT ISSUE	MD	AM	08.06.22
C15	CONTRACT ISSUE	AM	AM	01.07.22
C14	CONTRACT ISSUE	MD	AM	28.01.22
C13	CONTRACT ISSUE	CM	AM	07.09.21
C12	CONTRACT ISSUE	CM	AM	19.07.21
C11	CONTRACT ISSUE	CM	AM	29.11.20
C10	CONTRACT ISSUE	CM	AM	09.10.20
C09	CONTRACT ISSUE	CM	AM	04.09.20
C08	CHANGES DUE TO UPDATE IN FIRE STRATEGY	JL	AM	24.04.20
C07	CONTRACT ISSUE ADDENDUM	JL	AM	06.03.20
C06	CONTRACT ISSUE ADDENDUM	JL	AM	28.02.20
C05	CONTRACT ISSUE ADDENDUM	JL	AM	14.02.20
C04	CONTRACT ISSUE ADDENDUM	JL	AM	05.02.20
C03	CONTRACT ISSUE ADDENDUM	JL	AM	08.11.19
C02	COMMENTS INCORPORATED	JL	AM	16.10.19
C01	CONTRACT ISSUE	JL	AM	16.08.19
Rev	Description	By	Check	Date

The design illustrated upon this drawing has been coordinated with the following discipline models:

ISSUE	DATE RECEIVED	RECEIVED FROM	MODEL NAME
A	30/11/2021	OMA	MF-OMA-XX-XX-M3-A-00-0001 (FS8)
S	07/10/2021	Buro Happold	MF-BHE-XX-XX-M3-S-00-002 (FS48)
Y	07/10/2020	Charcoal Blue	MF-CSL-XX-XX-M3-Y-01-0001 (FS6)
A	02/11/2020	Ryder	MF-RYD-XX-XX-M3-A-00-0001

CLIENT
MANCHESTER CITY COUNCIL
Albert Square, Town Hall,
M2 5DB, Manchester
United Kingdom

T +44 [0] 161 234 5004

BDP.
11 Ducie Street
PO Box 85
Piccadilly Basin
Manchester
M60 3JA
United Kingdom

T +44 (0)161 828 2200
www.bdp.com

DRAWING STATUS
Contract

PROJECT
P2008093
Manchester Factory

DISCIPLINE
Mechanical Engineering Services

ORIGINATOR
Warehouse
Schematic
Ventilation and Air Conditioning Systems

PROJECT LEAD	DRAWER	DATE FIRST ISSUED	SCALE	
CC	AM	27/06/2018	NTS	@ A0

DRAWING No.
MF-BDP-WH-XX-DR-M-65-0103

REVISION
C17

Appendix VIII Bar Servery Pizza Oven – Mech Engineer Filenote

DESIGN NOTE

BDP.

MEP ENGINEERING

PROJECT	The Factory, Manchester	ISSUE DATE	09.06.2023
PROJECT NUMBER	P2008093	ISSUED BY	AM
REFERENCE	MF-BDP-XX-XX-DN-MX-11-0097	APPROVED BY	SM
REVISION	C01	PURPOSE OF ISSUE	S2

SUBJECT **DN97 – FOYER BAR VENTILATION**

INTRODUCTION

The fit-out of the foyer bar has been taking place by separate parties to the main MEP installation and during the fit-out it became apparent that there would be a food offering in the bar, in particular the installation of an electric pizza oven.
There being no direct extract from the foyer bar there has been a request to review the impact of the inclusion of this particular oven.

SITUATION

The ventilation in the foyer comprises general fresh air and extract and numerous fan coil units that supply treated air through slot diffusers and recirculate air through the filtered inlets to the fan coil units.

It is understood that there is a plan to install a pizza oven in the foyer bar to provide snacks to customers in the Foyer.

The pizza oven is provided by the specialist catering fit-out team.

We understand that this is an electric pizza oven and not the solid fuel type.

The manufacturer of the pizza oven has advised that:

- electric ovens do not generate toxic fumes in the way that ovens fuelled by other means do.
- on the odd occasion a bit of smoke can be generated if excessive cheese or flour is present, the self-ventilating hood was developed to deal with this.

Following on from queries about the performance of the hood we received the following statements pertinent to the hood supplied with this equipment.

The self-venting hood contains more than the basic grease filtration of a domestic product and is a commercial grade product designed and manufactured by LLK (the pizza oven manufacturer).

Specifically, the hood contains a H13 Grade HEPA (High Efficiency Particulate Arrestance) filter alongside a bonded carbon panel. H13 being considered ‘medical grade’ is efficient at removing carbon dust in addition to the common smoke particles that EPA filters such as E10, E11, E12 remove.

A HEPA filter - by definition - removes more than 99.97% of particles at 0.3 microns (µm) in size, and a higher filtration efficiency for particulates larger than 0.3 µm. H13, being a less dense filter, reduces bypass leakages experienced with H14 systems where air seeks the path of least resistance and consequently H13 provides a better filtration to air flow ratio than the H14 grade.

LLK have advised that they have completed independent testing of the hood to verify its performance to H13, as per the table overleaf: -

Efficiency

CEN-EN 1822 FILTRATION CLASS		
CLASS	FILTERS GLOBAL EFFICIENCY % FOR MPPS PARTICLES	LOCAL EFFICIENCY% FOR MPPS PARTICLES
H11	≥95 %	-
H13	≥99.95 %	99.75%
H14	≥99.995 %	99.975%
U15	≥99.9995 %	99.997%

Recommended Final Pressure Drop
<600Pa
Maximum Final Pressure Drop
<1000Pa

TEMPERATURE = 90°C max.
RELATIVE HUMIDITY = 100% max.
TESTING = Each filter tested, and certificates are available on request

They acknowledged that in situations where filters are not well-maintained their effectiveness can become more limited over time. To assist in mitigating this their product is fitted with a constant airflow fan controller. As the filters capture the particulates and the pressure drop increases the hood monitors this and speeds up the to maintain the required performance. The product proposed includes both warning light and acoustic alarm to check/change filters.

LLK have provided maintenance instructions that indicate the following: -

- direct replacement of lower layer of filter media every 2 months or 500 hours of use
- inspection of the HEPA filter at the same interval as replacing the lower filter media
- replacement of upper (HEPA13) layer of media every 6 months or 1500 hours of use
- replacement of bonded carbon filter media every 6 months or 1500 hours of use

CONCLUSION

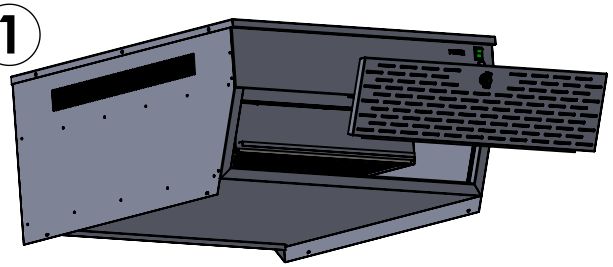
In consideration of the above, the use of an electric pizza oven in combination with the manufacturers matched self- venting filtration hood such as the one proposed, should not impair the effectiveness of the general ventilation for the foyer – subject to the manufacturers recommended maintenance regime being complied with and the normal duty of the operators to minimise food spillage and clear any excess/ spillage as it occurs.

A statement from the venue operator and their catering operator highlighting their awareness of the hazards and the need for proper maintenance may be beneficial to this consideration.

Appendix IX Bar Servery Pizza Oven – Manual

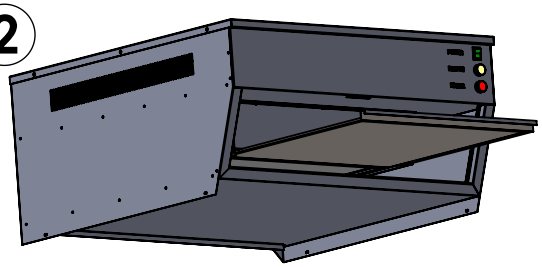
IMPORTANT: Disconnect unit from the electrical supply before carrying out any maintenance.

1



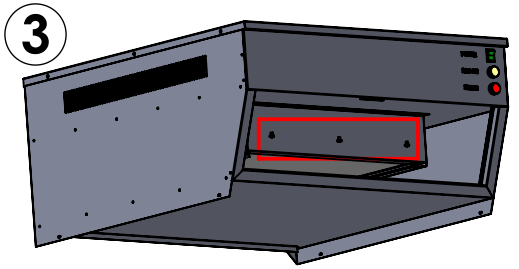
Remove baffle door and set aside

2



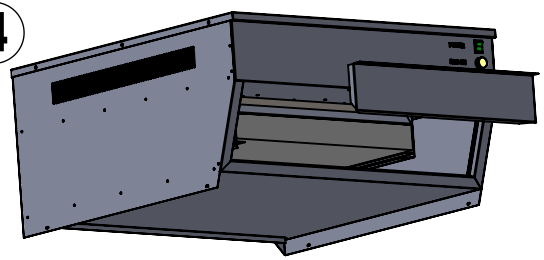
Slide out Tray and replace lower layer of filter media every 2 months or 500 hours of use
Replace upper layer of media every 6 months or 1500 hours of use

3



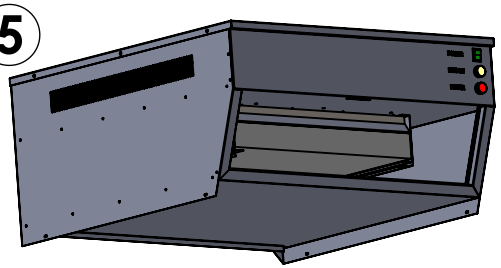
Remove 3 of screws to loosen door

4



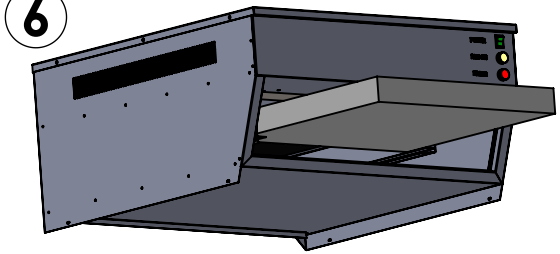
Remove filter door

5



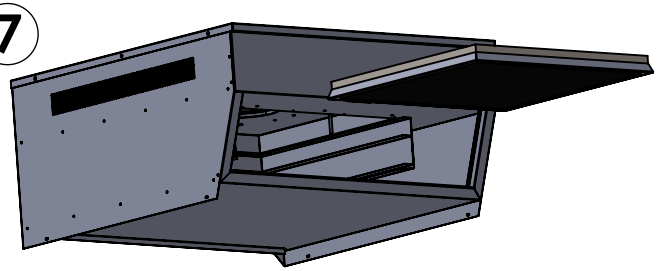
Main filter stack can now be inspected

6

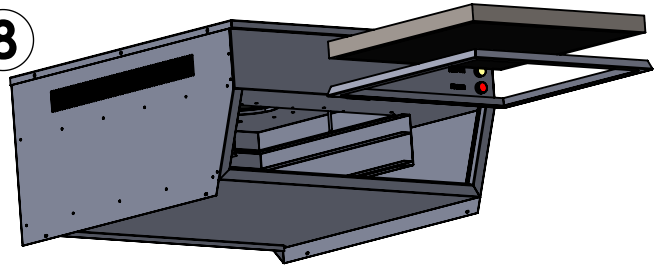


Slide out large HEPA filter from stack,
Inspect every 2 months or 500 hours of use
Replace every 6 months or 1500 hours of use

7



8



Slide out Bonded Carbon Filter and lift out of reusable cassette
Replace every 6 months or 1500 hours of use

9

After refitting all filters.
replace the filter door and screws and close the baffle door.

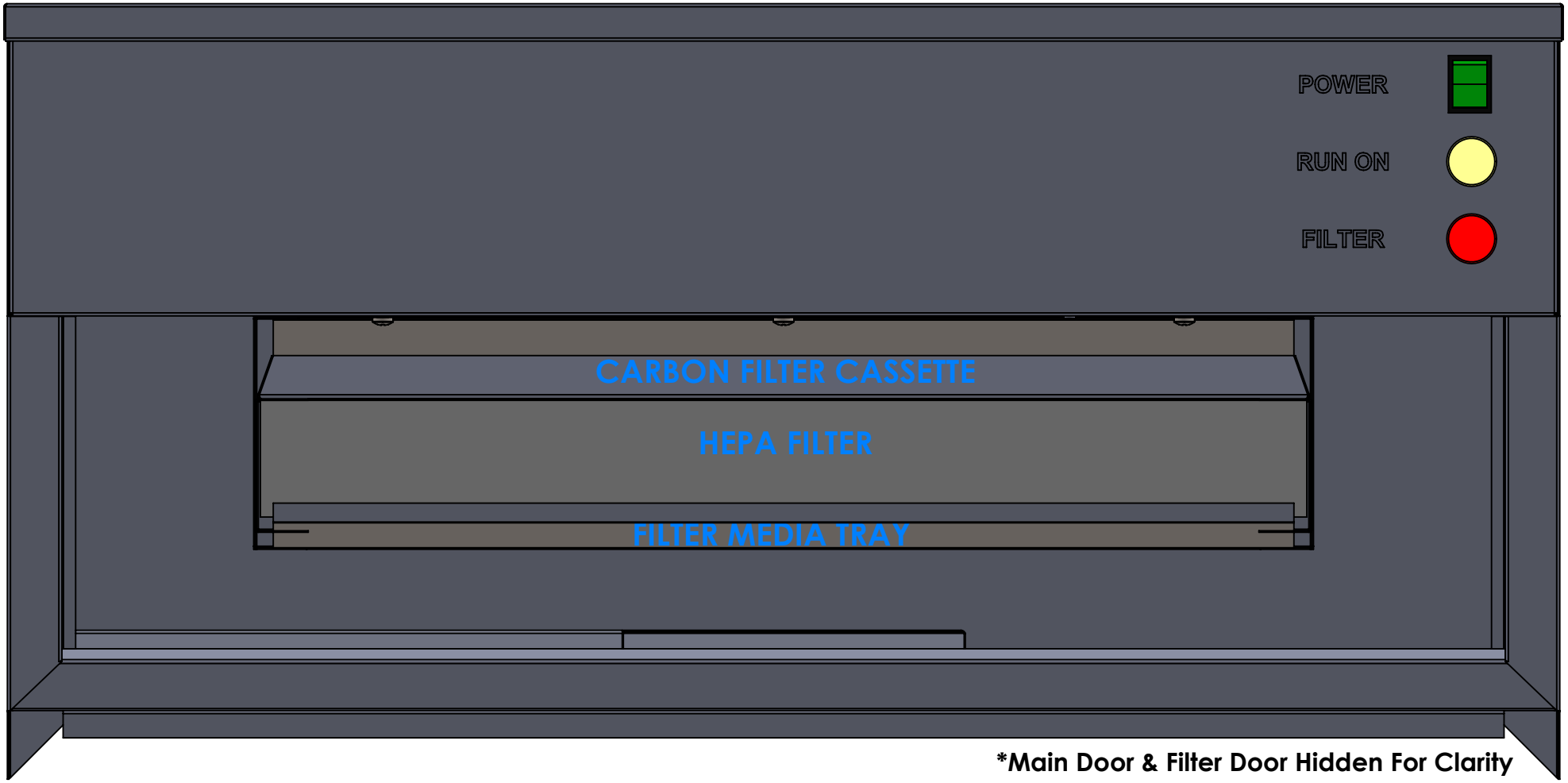
Important Operational information:

- The hood unit must be connected to a mains power supply during all phases of operation.
- The hood unit must be turned on at all times during the ovens heating up and use.
- The hood has a built in 'run on' circuit that will ensure the fan is on until the oven is cool enough after use, the oven doors should be left open during this phase to reduce the cooling time required.
- If the red filter light comes on all filters must be inspected for damage or build up.

PIZZA AND CATERING EQUIPMENT PROFESSIONALS

LINDA LEWIS KITCHENS	MAINTENANCE PROCEDURE			
TIZIANO PIZZA OVEN HOOD	DATE: 18/06/2021	SHEET 1 OF 2	DO NOT SCALE DRAWING	REV: C

Filter Stack Order

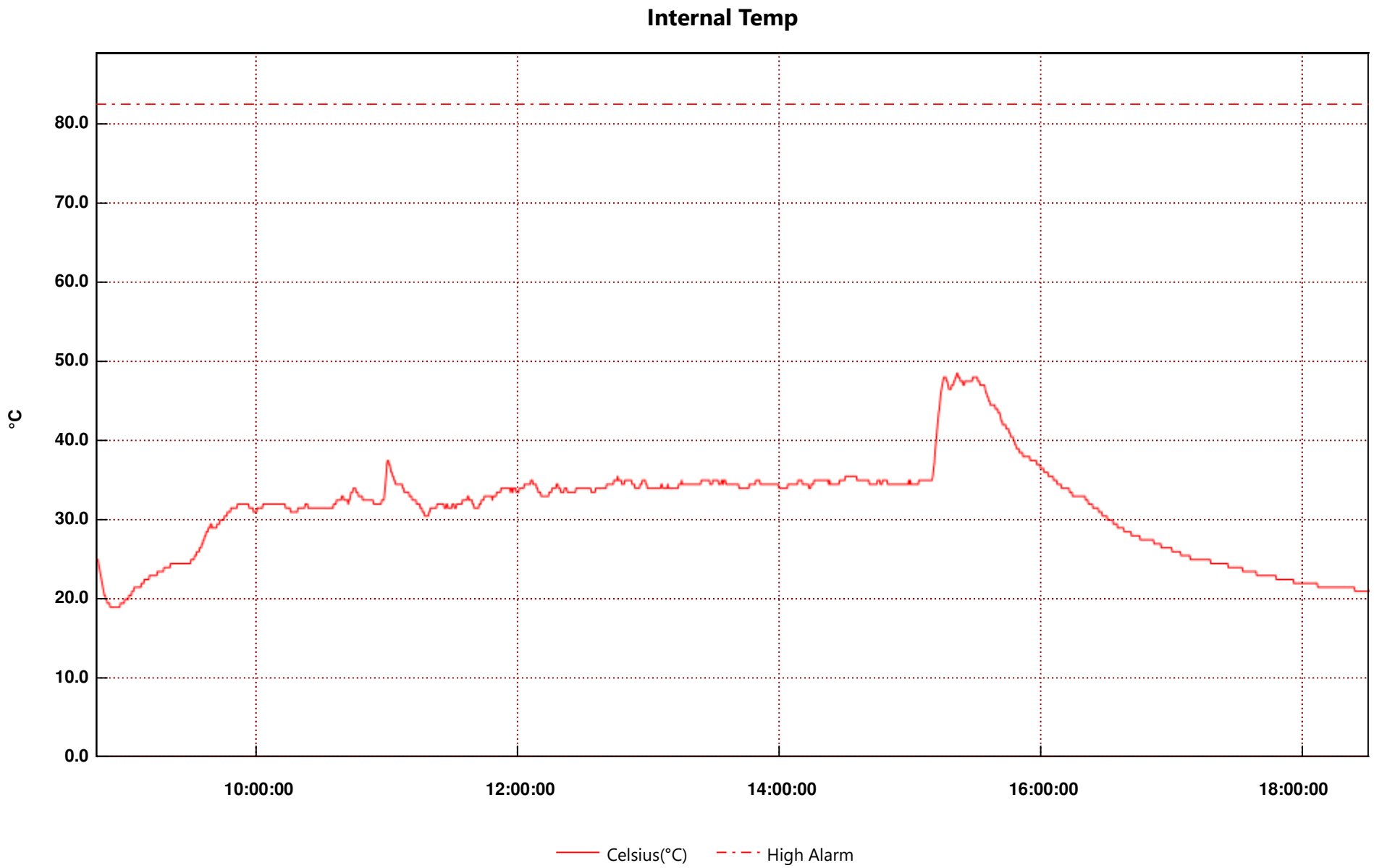


*Main Door & Filter Door Hidden For Clarity

PIZZA AND CATERING EQUIPMENT PROFESSIONALS

LINDA LEWIS KITCHENS	MAINTENANCE PROCEDURE			
TIZIANO PIZZA OVEN HOOD	DATE: 18/06/2021	SHEET 2 OF 2	DO NOT SCALE DRAWING	REV: C

Appendix X Bar Servery Pizza Oven – Internal Logger



From: 30 May 2019 08:46:37 - To: 30 May 2019 18:30:37

Appendix XI Bar Servery Pizza Oven – Maintenance Checklist

Linda Lewis Kitchens Ltd, T/A LLK
Units 3-5 Belgrave Industrial Estate
Honeywell Lane
Oldham
OL8 2JP
T: 0161 696 0052
E: service@llkpizzapros.co.uk

Tiziano Self-Venting Hood

This must be filled out and returned to LLK Head Office failure to return will void any warranty.

Installers Name (Print) _____ Date ____/____/____
Postcode of Site_____ Location on Site _____
Serial Number (on the back left) _____

Installer Check List

- Has the hood been tested under power YES / NO
- Have photos been taken of the full installation YES / NO
- Have site been shown how to use the hood and read the user guide YES / NO
- Has the run on time been checked for the oven configuration YES / NO
- Does the customer understand they must never use the oven if the hood is not running YES / NO
- Has the customer been told the doors must be open while cooling down YES / NO
- Is the installer happy with the installation YES / NO

Installers Notes

_____

_____

_____

Customer

- Have all staff been shown how to use the hood and read the user guide YES / NO
- Do all the staff understand they must never use the oven if the hood is not running YES / NO
- Who will be responsible for the basic user maintenance:

Names (Print) _____

- Who will be responsible for ordering the replacement filters:

Names (Print) _____/_____

Email (Print) _____/_____

Company Registration No. 05746688 | VAT No. 881 360617

Linda Lewis Kitchens Ltd, T/A LLK
Units 3-5 Belgrave Industrial Estate
Honeywell Lane
Oldham
OL8 2JP
T: 0161 696 0052
E: service@llkpizzapros.co.uk

Customers Notes

_____

_____

_____

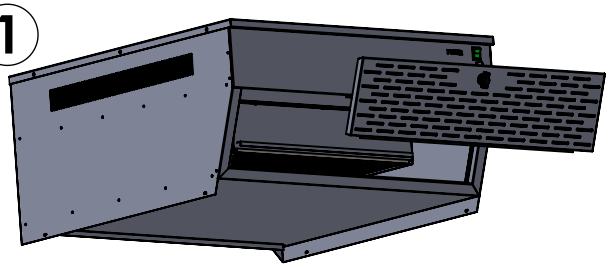
_____

I declare that I have read and understand how to use the hood and how to reorder the filters.
Name _____Email _____
Position _____Date _____

Company Registration No. 05746688 | VAT No. 881 360617

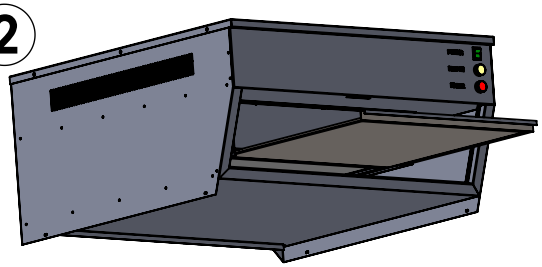
IMPORTANT: Disconnect unit from the electrical supply before carrying out any maintenance.

1



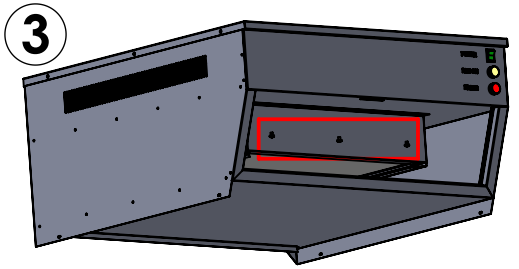
Remove baffle door and set aside

2



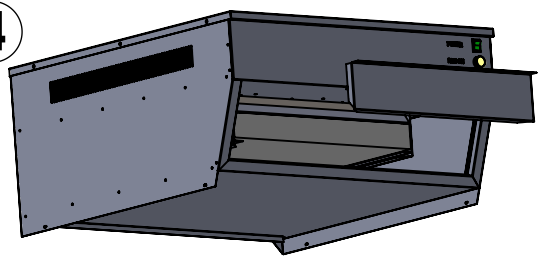
Slide out Tray and replace lower layer of filter media every
2 months or 500 hours of use
Replace upper layer of media every 6 months or 1500 hours of use

3



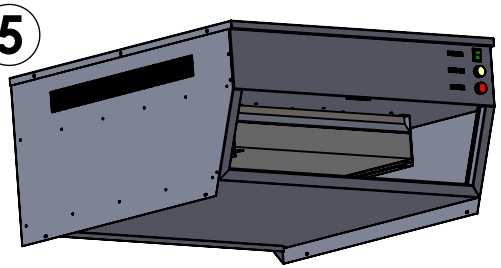
Remove 3 of screws to loosen door

4



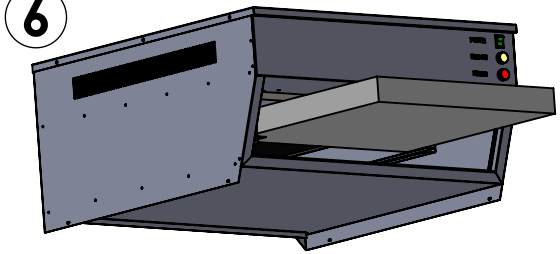
Remove filter door

5



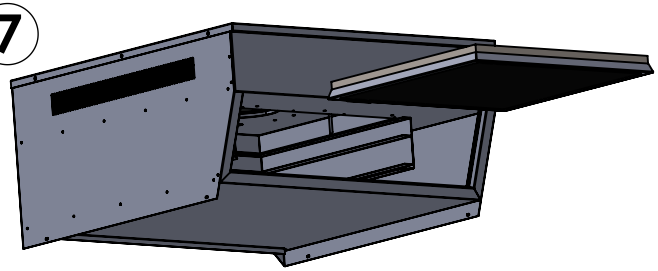
Main filter stack can now be inspected

6

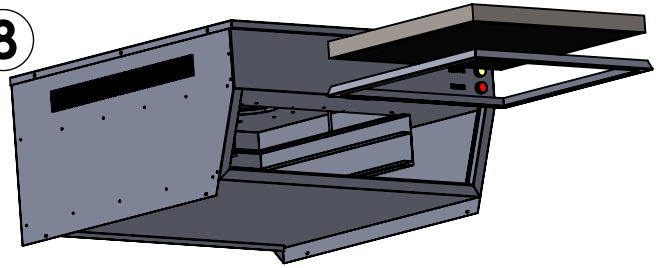


Slide out large HEPA filter from stack,
Inspect every 2 months or 500 hours of use
Replace every 6 months or 1500 hours of use

7



8



Slide out Bonded Carbon Filter and lift out of reusable cassette
Replace every 6 months or 1500 hours of use

9

After refitting all filters.
replace the filter door and screws and close the baffle door.

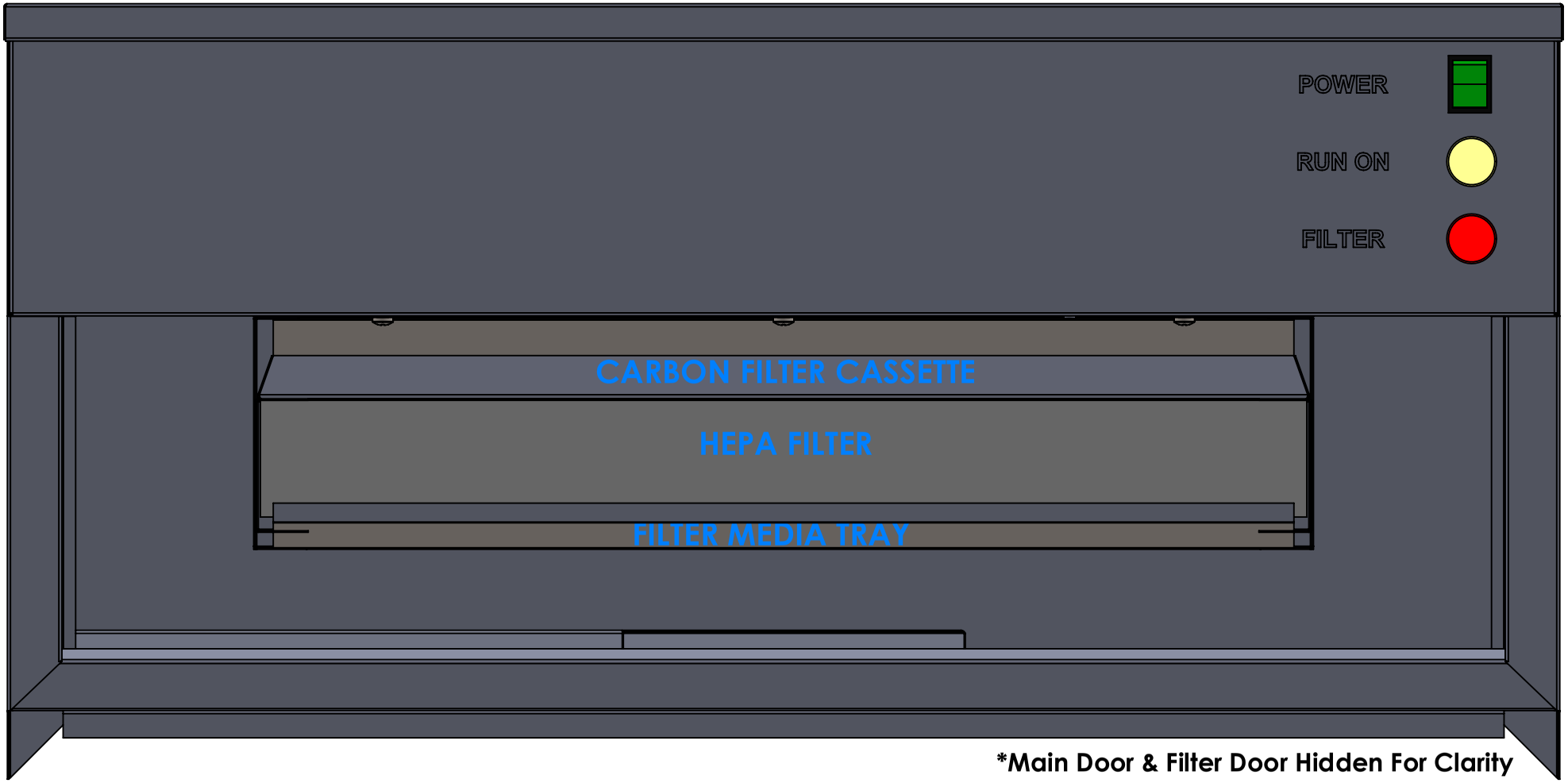
Important Operational information:

- The hood unit must be connected to a mains power supply during all phases of operation.
- **The hood unit must be turned on at all times during the ovens heating up and use.**
- The hood has a built in 'run on' circuit that will ensure the fan is on until the oven is cool enough after use, **the oven doors should be left open during this phase** to reduce the cooling time required.
- If the red filter light comes on all filters must be inspected for damage or build up.

PIZZA AND CATERING EQUIPMENT PROFESSIONALS

LINDA LEWIS KITCHENS	MAINTENANCE PROCEDURE			
TIZIANO PIZZA OVEN HOOD	DATE: 18/06/2021	SHEET 1 OF 2	DO NOT SCALE DRAWING	REV: C

Filter Stack Order



*Main Door & Filter Door Hidden For Clarity

PIZZA AND CATERING EQUIPMENT PROFESSIONALS

LINDA LEWIS KITCHENS	MAINTENANCE PROCEDURE			
TIZIANO PIZZA OVEN HOOD	DATE: 18/06/2021	SHEET 2 OF 2	DO NOT SCALE DRAWING	REV: C

Appendix XII Installation inspection sheets from Purified Air

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

Tel: +44 1708 755414
Fax: +44 1708 721488
E-Mail: enq@purifiedair.com
Web Site: www.purifiedair.com

ESP Commissioning Report

Equip No:		**Inspect No:**	51605	
Make/Model:		**Job No:**	190899	
Serial No:		**Contact:**		
Cust Equip No:		**Inspected:**	26/09/2023	
Meter:		**Printed:**	29/09/2023	**Page:** 1 of 1

Site:	Manchester International Festival Water Street Manchester M3 4JQ

Items to Inspect	Result	Comments
ESP COMMISSIONING REPORT		
Details of Access equipment needed for service (Ladder, Tower)	-	Roof
Access for future maintenance	Good/Poor - Please Comment	Ok
Air Flow Direction checked	Yes	
Charge rate to collector	Please Give Details	Y
Charge rate to ioniser	Please Give Details	Y
Collector cells checked and free from damage	Yes	
Collector cells fitted correctly	Yes	
Door Safety switch checked	Yes	
Drain plug in place	Yes	
ESP Interlocked with fan so that unit switches off when fan not running	Yes	
ESP unit wired to to mains power	Yes	
Indicator light functioning	Yes	
Mesh Filter fitted front & back	Yes	

Service carried out by: Engineer Name: Carl Birchall

Signature:



Customer Name: Customer Not Present

Signature:

Job Sheet

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

Tel: +44 1708 755414
Fax: +44 1708 721488
E-Mail: enq@purifiedair.com
Web Site: www.purifiedair.com

Job Site:

Manchester International Festival
Water Street
Manchester
M3 4JQ

Job Number:	190899		
Logged:	03/07/2023		
Reference:	34997 + 35312 / Sage Sale		
Job Type:	Commissioning	**Page:**	1 of 2
Contact:		**Tel:**	

Job Equipment:

Equipment	Cust Equip	Visit(s)	Status	Meter
Purified Air Limited / ESP4500E / 10091 /		1	Done	-
Purified Air Limited / ESP4500E / 10092 /		1	Done	-
Purified Air Limited / ESP4500E / 10093 /		1	Done	-
Purified Air Limited / UVO1000 10 Lamp Unit / 10094 /		1	Done	-
Purified Air Limited / UVO500 2 Lamp Unit / 10095 /		1	Done	-

Description:

COMMISSIONNNG TO ESP4500E (BMS'S TO FIT X 3, 1 X UVO500 & 1 X UVO1000 : SALES ORDER 34997+35312

ENGINEERS COMMISSIONING TO 3 X ESP4500E UNITS (INCLUDING RETRO-FIT FOR BMS'S) 1 X UVO1000 10 LAMP UNIT & 1 X UVO500 2 LAMP UNIT.

Labour Visits

Visit	Engineer Report	Eng.	Date	On	Off	Hours
1	Commission 3 x esp 4500s 1 x uvo 1000 1 x uvo 500 Fit bms to ESP/UVO units	CB	26/09/23	10:00	14:00	04:00

Part Description	Part Number	For Equip	Quantity
UV LAMP G36T5VH/HO/4 (LARGE)	UVOZONEBULBD	10094	10
UV LAMP LTCQ70VH/2G11(SMALL)	UVOMINIBULB	10095	2

Job Sheet

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

Tel: +44 1708 755414
Fax: +44 1708 721488
E-Mail: enq@purifiedair.com
Web Site: www.purifiedair.com

Job Site:

Manchester International Festival
Water Street
Manchester
M3 4JQ

Job Number:	190899		
Logged:	03/07/2023		
Reference:	34997 + 35312 / Sage Sale		
Job Type:	Commissioning	**Page:**	2 of 2
Contact:		**Tel:**	

Customer:

Name: Customer Not Present

Signature:

Date:

Engineer:

Name: Carl Birchall

Signature:



Date: 26/09/2023

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

Tel: +44 1708 755414
Fax: +44 1708 721488
E-Mail: enq@purifiedair.com
Web Site: www.purifiedair.com

UVO500 Commissioning

Equip No:		**Inspect No:**	54662	
Make/Model:		**Job No:**	190899	
Serial No:		**Contact:**		
Cust Equip No:		**Inspected:**	26/09/2023	
Meter:		**Printed:**	29/09/2023	**Page:** 1 of 1

Site:	Manchester International Festival Water Street Manchester M3 4JQ

Items to Inspect	Result	Comments
UVO500 COMMISSIONING REPORT		
Access to the equipment	Yes	
Air flow damper set	Yes	
Does the UVO switch off in conjunction with the fan	Pass	
Location of unit	Location Of Unit	Kitchen
Door safety switches working correctly	Yes	
Peto Tube for air flow switch been secured into the duct	Yes	
Power light functioning correctly	Yes	
UVO installed before the fan	Pass	
UVO Lamp operation proved	Yes	

Service carried out by: Engineer Name: Carl Birchall

Signature:



Customer Name: Customer Not Present

Signature:

Appendix XIII Factory/Aviva site specific maintenance frequency recommendations from equipment manufacturer Purified Air

Purified Air Ltd, Lyon House, Lyon Road,
Romford, Essex. RM1 2BG ENGLAND
Tel: 01708 755414 Fax: 01708 721488
e-mail: enq@purifiedair.com
website: www.purifiedair.com

PREVENTATIVE MAINTENANCE ESTIMATE

DATE: 09th October 2023

CLIENT:

CONTACT NAME:

CONTACT DETAILS

PREMISES:

SCHEDULE OF EQUIPMENT: 3 x Purified Air ESP4500EI
1 x Purified Air UVO-1000 (10 lamp Unit)
1 x Purified Air UVO-500 (2 lamp Unit)

WORK TO BE CARRIED OUT:
E.S.P

- Replace pre-filter, ioniser, collector and final filter. Those that are removed to be returned to Purified Air's stores for cleaning.
- Drain off accumulated grease from filter compartment
- Clean inside and outside of product with detergent
- Check door sealing material
- Check high voltage circuit
- Check function of indicator lamps

UV-O System

- Clean lamps/Check Ops
- Replace Filter
- Replace Lamps

Task	Frequency
Service 3 x ESP4500	Every 2 - 3 Months
Replace x UV-1000 Filter	Every 3 - 4 Months
Replace 12 x UVO Lamps	Annually

- Please note: These frequencies are a "best estimate" and may need to be amended.