Applied ENERGY

OCM Luxembourg Manchester Aparthotel S.A.R.L

Whitworth Locke

Kitchen Extract Report

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Contents

1.0 INTRODUCTION 3

2.0 PLANNING CONDITION 3

3.0 PROPOSAL 3

3.1 Kitchen Canopy 4
3.2 Kitchen Extract System 4
3.3 Kitchen Supply System 4
3.4 Ductwork 5

4.0 RISK ASSESSMENT FOR ODOUR 5

4.1 Dispersion 6
4.2 Proximity to Amenities 6
4.3 Size of Kitchen 7
4.4 Cooking Type 7
4.5 Final Assessment 7

1.0 INTRODUCTION

This document has been prepared to provide details of the kitchen ventilation system to support the planning application for Whitworth Locke in Manchester.

The building has two existing disused A3 units. The unit on the corner of Princess Street and Whitworth Street was previously a Chinese restaurant and the other unit was an Indian restaurant. Both units have redundant air conditioning and kitchen extract plant with the Chinese restaurant discharging the kitchen extract at GF, adjacent to the building's main entrance which is currently not compliant with most Environmental Health Officer (EHO) requirements.

The proposal is to refurbish the ground floor F&B areas, which will then be occupied and operated by a third party tenant – Zanna Group. The basement kitchen will be convert to a different use demise with no cooking facilities and therefore is no included in this assessment. All existing kitchen ventilation plant and equipment will be replaced in line with planning regulations and DEFRA guidance. The detailed design for the commercial kitchens is yet to be finalised and agreed and therefore the assessment has been prepared based on the current knowledge and understanding.

Detailed arrangement of the existing and proposed kitchen extract systems including elevation view is provided in a separate file as part of the application.

2.0 PLANNING CONDITION

Section 4.0 of the MCC Guidance Document 03 states: -

'The Department of Environment, Food and Rural Affairs' (Defra) Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems, January 2005 provides a means by which appropriate mitigation measures can be defined for each specific site. Compliance with this guidance should be the minimum requirement.'

3.0 PROPOSAL

The proposed commercial kitchen is to be located as a replacement for the existing ground floor kitchen and is to be occupied by a brasserie type kitchen style food offering. The new kitchen is to have a new independent extraction system utilising the existing extract duct route and discharge at the same location at roof level. Therefore, the DEFRA assessment has been carried out based on the worst-case scenario i.e. mixed style restaurant.

Detailed arrangement of the existing and proposed kitchen extract systems including elevation view is provided in a separate file as part of the application.

3.1 Kitchen Canopy

It is proposed that a wall type canopy (supply and extract) with full length extract plenums fitted with stainless steel baffle type grease filters will be provided in the kitchens.

The canopy is to be constructed from grade 304 satin finish stainless steel with all joints and seams welded and/or liquid tight. Removable stainless-steel grease collecting drawers are to be provided within the apron of the filter housing.

Make-up-air is to be provided to the kitchen area via plenum ductwork with internal baffle plates to ensure even air discharge across the outer face. The canopy is to be fitted with welded hanging cleats to each corner and pre-drilled to accept M10 drop rods.

The anticipated total ventilation rates will be as follows:

- Extract – 3.75 m^3/s
- Supply – 3.0 m^3/s

The canopy is to conform fully to the standards and specifications of HVCA Specification for Kitchen Ventilation Systems DW172. The grease filters are to comply with the requirements of LPS 1263.

3.2 Kitchen Extract System

It is proposed that the kitchen will be served by a single extract system utilising the existing and redundant kitchen extract duct route. The proposed kitchen extract routes will not enter or interfere with any listed areas of the Central House building.

It is proposed that a roof cowl will be provided to discharge the exhaust air from the kitchen with an efflux velocity of between 10-15 m/s.

The fan will be selected with a 10% pressure margin over and above the design resistance and the motor will be IP55 rated. An example fan data is provided in an Appendix A.

The proposed extract fan will be mounted at high level within the F&B demise complete with high deflection ant-vibration mounts with 95% isolation efficiency at the lowest potentially intrusive audio frequency (20 Hz). The proposed platform will be supported from the roof from the most significant structural element available (e.g. beams and columns).

3.3 Kitchen Supply System

Supply ventilation will be designed to meet 85% of the extraction rate, therefore maintaining negative pressure within the kitchen and preventing any smells from escaping into the restaurant. It is proposed that

the supply air system is installed in accordance with DW172 Section 6 and incorporate all the necessary interlocks in accordance with BS6173.

It is proposed that the kitchen supply air is provided by means of fresh air make up air located at high level at ground floor level and above the atrium roof.

The duct will be fitted with the balancing dampers and adequate filtration in accordance with DW/172.

3.4 Ductwork

Access for cleaning the kitchen extract ductwork will be provided at the top level and the bottom of the vertical stack for chemical cleaning. Horizontal runs will be fitted with access panels at 2m intervals and in accordance with section 25 of HVAC publication TR/19.

All ductwork shall be low pressure class A and be in accordance with DW/172 and DW/144.

The kitchen extract ductwork will be routed from the kitchen to high level terminating a minimum 1 metre above the roof eaves. All ductwork will be suitably fire rated along its entire length in accordance with BS3476 part 24 and BS9999.

Noise breakout from the proposed kitchen extract ductwork will be controlled such that noise levels within the adjacent spaces achieve the background noise levels in accordance with the Acoustic consultant recommendations. Therefore, plant noise will be designed to achieve a level below NR25 in the guestrooms which is at a level below that expected as a result of noise ingress through the facade. The breakout noise can be expected to be controlled by utilising a suitable duct/riser construction which will also be designed to suitably control noise expected from such plant.

The supply ductwork is to be insulated along its length to minimise the risk of condensation during periods of cold weather.

Both the supply and extract ductwork will be supported using isolation hangers on all points of support.

4.0 RISK ASSESSMENT FOR ODOUR

In order to determine the level of odour the site will produce, and the necessary mitigation measures needed, a risk assessment has been carried out in line with Annex C of DEFRA's *Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems*.

The assessment summary is included for information.

The levels of risk are grouped in the table below.

Impact Risk	Odour Control Requirement	Significance Score*
Low to Medium	Low level odour control	Less than 20
High	High level odour control	20 to 35
Very high	Very high level odour control	more than 35

Four areas of risk are assessed to work out the score for the system which can then be correlated to the level of odour control required as detailed above.

Criteria	Score	Score	Details
Dispersion	Very poor	20	Low level discharge, discharge into courtyard or restriction on stack.
	Poor	15	Not low level but below eaves, or discharge at below 10 m/s.
	Moderate	10	Discharging 1m above eaves at 10 -15 m/s.
	Good	5	Discharging 1m above ridge at 15 m/s.
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge.
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge.
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge.
Size of kitchen	Large	5	More than 100 covers or large sized take away.
	Medium	3	Between 30 and 100 covers or medium sized take away.
	Small	1	Less than 30 covers or small take away.
Cooking type (odour and grease loading)	Very high	10	Pub (high level of fried food), fried chicken, burgers or fish & chips.
	High	7	Kebab, Vietnamese, Thai or Indian.
	Medium	4	Cantonese, Japanese or Chinese.
	Low	1	Most pubs, Italian, French, Pizza or steakhouse.

4.1 Dispersion

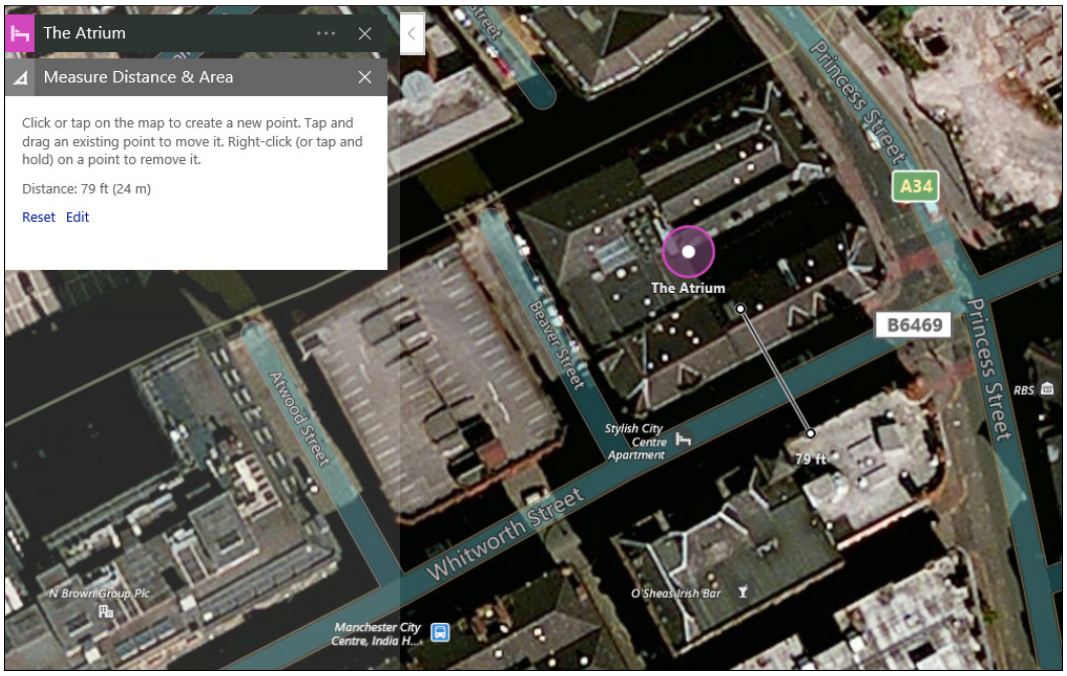
It is proposed that the extract system will discharge 1m above the eaves at a rate of 15 m/s.

This results in a score of 10.

4.2 Proximity to Amenities

The below picture gives an estimate of the proximity of the kitchen extract to the closest receptor of 24m

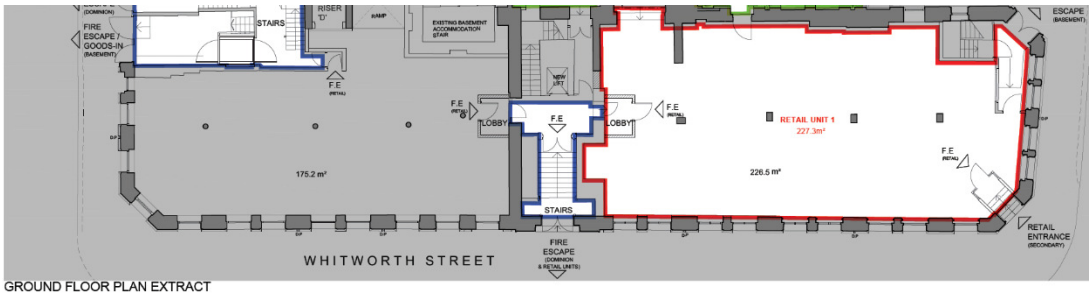
Resulting in a score of 5.



4.3 Size of Kitchen

The size of the kitchen is based on providing facilities to cater for a maximum of below 100 covers.

This results in a score of 3.



GROUND FLOOR PLAN EXTRACT

4.4 Cooking Type

The cooking type for the restaurant is deemed as high given the type of food being produced.

The food provided by the restaurant is going to be of a mixed type so it is deemed that the cooking type will be of a very high odour and grease loading.

This results in a score of 10.

4.5 Final Assessment

Taking into account the above scores, the proposed kitchen achieves a score of 28 which equates to a high risk. This requires a high level of odour control as defined within the DEFRA Guidelines and it is proposed that the following will be provided:

- Plasma Clean Electrostatix 4420 ESP filtration (or equal and approved)
- Plasma Clean Xtract 2100 Ozone odour control silent operation (or equal and approved)

4.6 Cleaning Maintenance Regime

The landlord will employ a kitchen extract cleaning specialist who will maintain the kitchen extract ductwork and all associated apparatus. The appointed specialist will be responsible for regular measurements of the grease deposit levels and manual cleaning of the system. A high level of kitchen usage is envisaged at this site, therefore the recommended cleaning period is to be 3 monthly and in line with DEFRA recommendations.

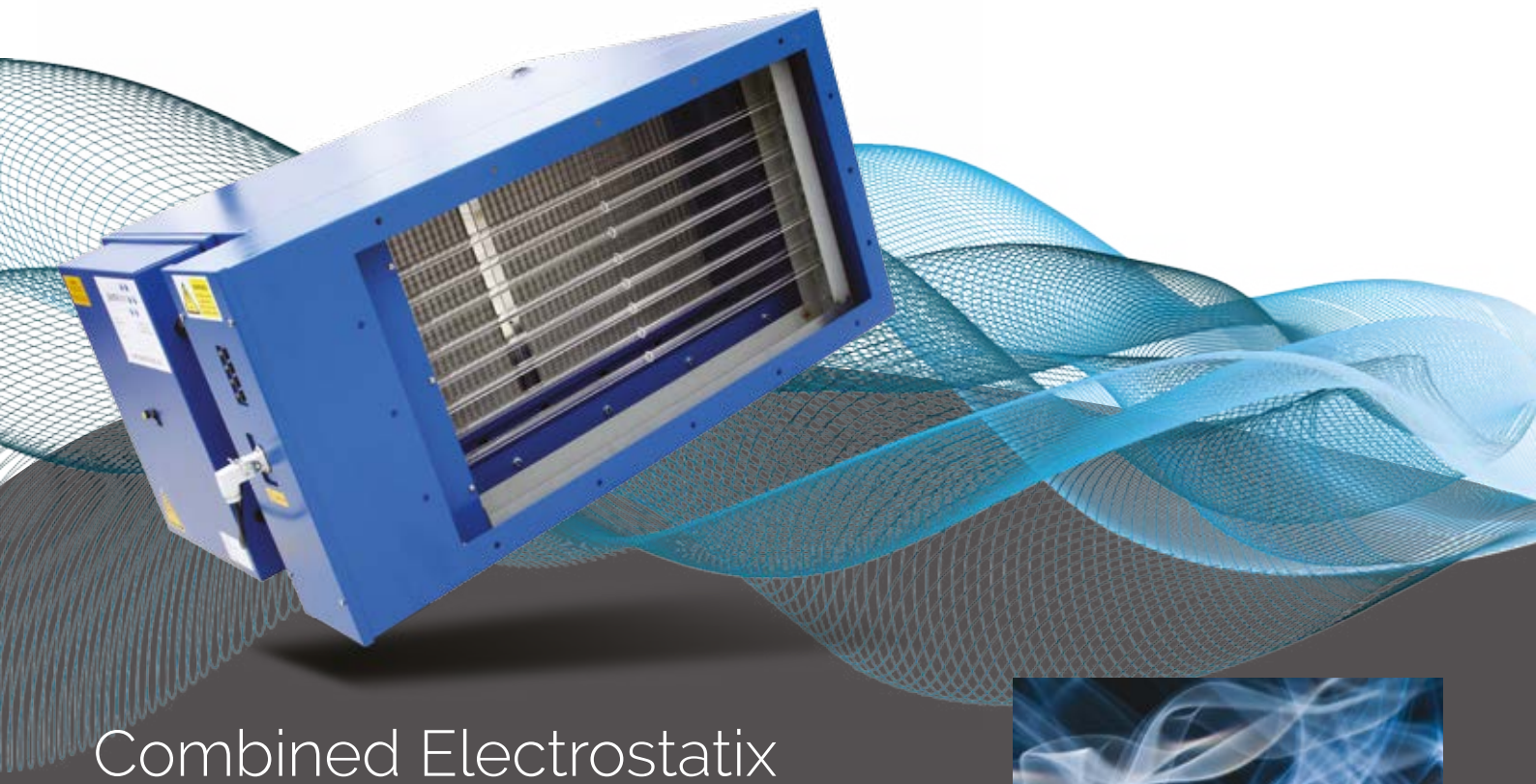
Additionally, all the grease and odour control equipment will be maintained as per the manufacturers' requirements to ensure that there is smooth and efficient operation.

APPENDIX

Appendix A. Proposed Equipment Technical Data

British innovation
Global distribution

plasmaclean
Odour and Infection Control



Combined Electrostatix with UV-C

Plasma Clean offers a range of integrated process technologies for the control of grease, smoke and odour for kitchen ventilation applications.

Combining electrostatic precipitation with UV-C light technology in a packaged unit results in the highly efficient removal of grease, smoke and odour.

The result is a cost effective, small footprint solution which is ideal for a wide range of food service ventilation applications.

Product Specification		
Model	PCL 5000 ESP/UV-C	PCL 7500 ESP/UV-C
Dimensions	533H x 1085W x 855D mm	533H x 1547W x 855D mm
Air Volume	1.4 m^3/s	2.1 m^3/s
Supply	1 phase / 230 Vac/ 5A /50-60Hz	1 phase / 230 Vac / 5A / 50-60Hz
Power	up to 750w	up to 800w
Weight	92kg	130kg
Pressure	140Pa (dirty filters)	140Pa (dirty filters)



Combining electrostatic precipitator technology with UV-C light in a single small footprint unit combats grease, smoke and odour.

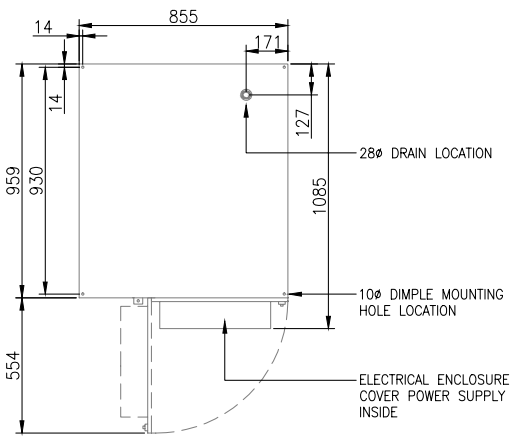
The key advantages of the combined ESP / UV-C system are:

- Integrated grease, smoke and odour removal
- Keeps extract ductwork virtually grease free
- Reduced fire risk
- Low cost and limited maintenance requirements
- Ability of heat recovery due to grease-free air
- Small footprint

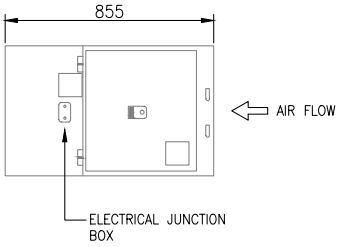
www.plasma-clean.com ask@plasma-clean.com +44 (0)161 443 4125

Technical drawings **PCL 5000 ESP/UV-C**

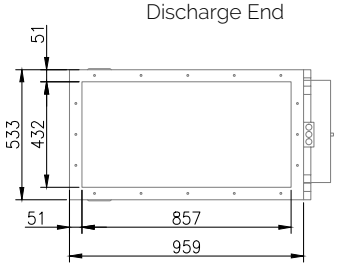
Top View



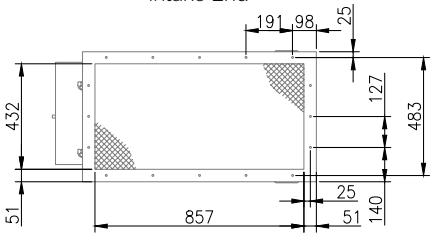
Front View



Discharge End

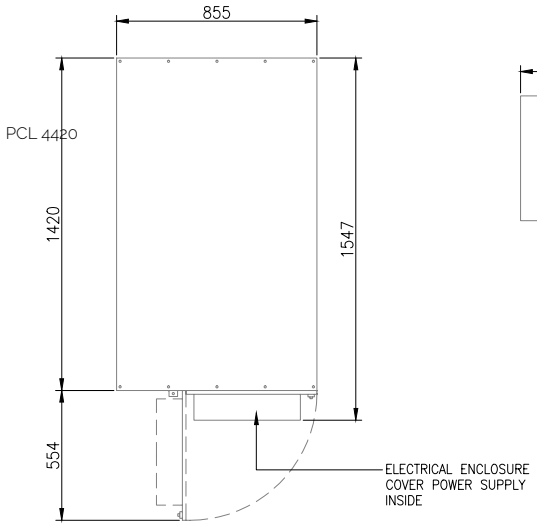


Intake End

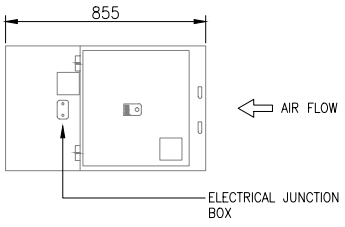


Technical drawings **PCL 7500 ESP/UV-C**

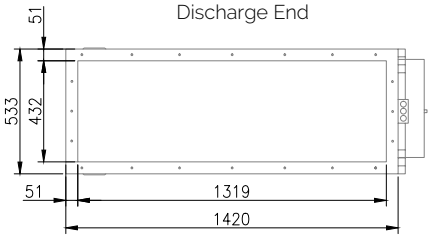
Top View



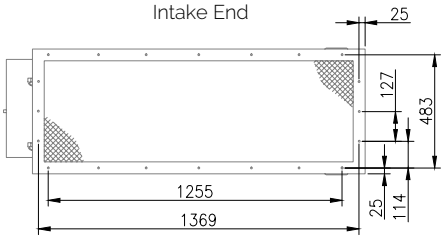
Front View



Discharge End



Intake End



Any questions?

Contact one of our engineers who will be at hand to advise on the most appropriate odour control solution.

Email: ask@plasma-clean.com
Tel: +44 (0)161 443 4125

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Plasma Clean is continuously improving its products and services and reserves the right to alter designs without prior notice.

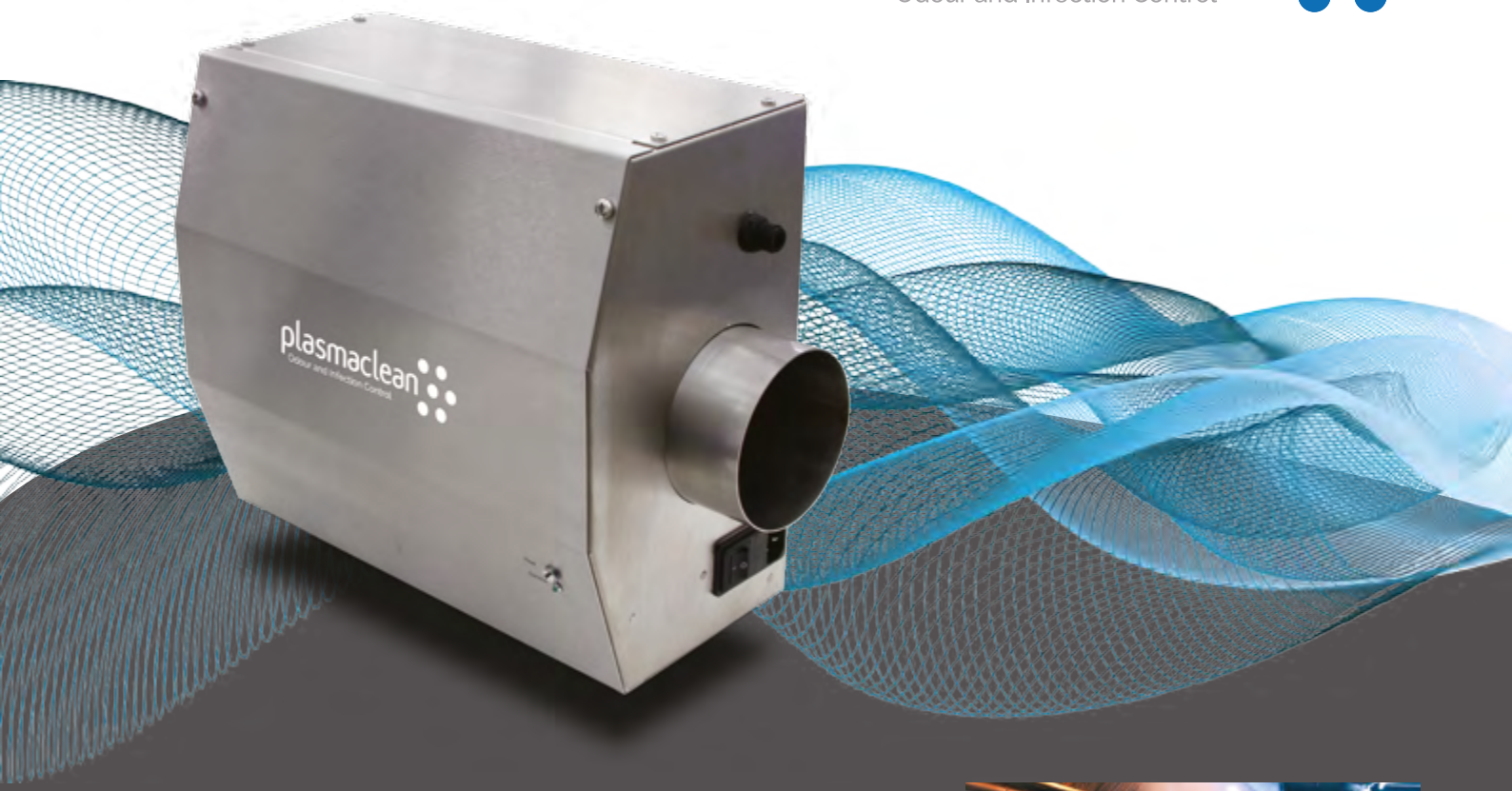
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Odour and Infection Control

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Odour and Infection Control



Xtract 2100

The Plasma Clean Xtract uses ozone - a well known disinfectant and odour neutralizer - which is released directly into the kitchen ventilation system. Here it immediately starts to act on the cooking odours.

Simple to install, with low maintenance and running costs, this versatile modular solution provides affordable and reliable odour control, making it the perfect partner for a wide range of cooking applications.

Product Specification		
Model	Xtract 2100	Xtract 2100 Plus
Capacity	Up to 1.5 m^3/s	Up to 2 m^3/s
Power	160W	220W
Pressure Drop (Pa)	0 (ozone injection)	
Supply	230Vac / 1 phase / 50-60Hz	
Dimensions	307H x 343W x 180D mm	
Weight	10kg	
Safety	Curcuit breaker 5A required Air flow proving switch installed Fan power supply interlock recommended	
Operation	Fully automatic	

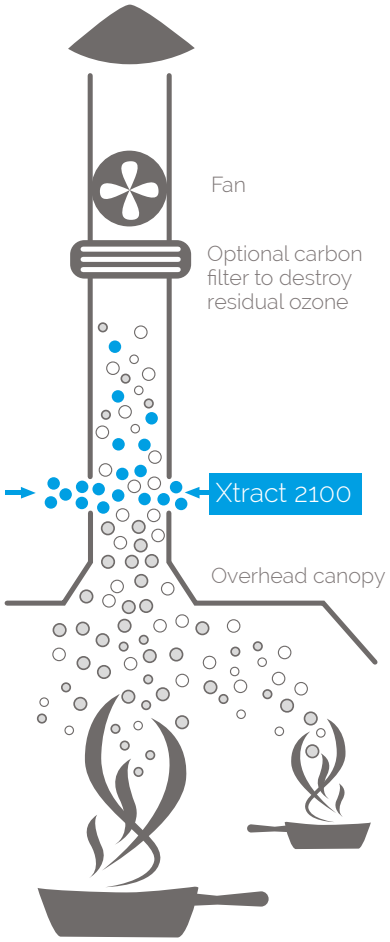


The compact and lightweight units have been designed for modern kitchens, where space is at a premium, and are an ideal solution for fast food bars, pubs and restaurants.

Xtract 2100 versus conventional odour control solutions

- Low capital and running costs
- Simple installation and maintenance
- No consumable chemicals
- Compact, lightweight and robust
- Quiet operation
- Environmentally friendly
- Tested to EN13725:2003

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Oxidation using ozone and activated oxygen ions is used to treat odour emissions from commercial and industrial kitchen processes (DEFRA, 2005: Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems). The Plasma Clean Xtract injects ozone into the kitchen extraction canopy where it reacts with odour. The ozone itself is consumed during the process and is converted back into oxygen.

Compact and Lightweight

The unit has been designed to be compact 307mm (H) x 343mm (W) x 180mm (D) and lightweight (10kg) so that it can be installed in kitchen areas where space is at a premium and / or where there is little load bearing capacity.

Installation

The unit has been designed to attach to the wall adjacent to the kitchen canopy or adjacent ductwork. The outlet is then connected into the extraction system and the unit is plugged in or hardwired into mains electricity (230V / single phase / 50-60Hz) via a main fan control box. Full installation and operating instructions are provided.

Silent Operation

The unit sits outside of the kitchen extraction system and ozone is drawn in by the existing fans. There is no need to upgrade the existing fan and the unit operates silently.

Servicing

Plasma Clean recommends a yearly service to ensure efficient operation, and can offer a planned maintenance contract.

Additional Options

A booster fan can be fitted in the unlikely event that the kitchen extraction fan can not draw air through the unit. A site survey option is available, as is a planned maintenance contract.

Any questions?

Contact one of our engineers who will be at hand to advise on the most appropriate odour control solution.

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Extract Fans - High Temperature Applications

t-line 120 high temperature

Versatile extract fan units, particularly suitable for higher air temperatures and resistances

- Low / high temperature
- Duty range 0.15 to 11.0 m^3/s
- Low energy / high efficiency fans
- Low SFPs to achieve L2 Building Regulations
- Up to 120 °C operating temperature
- Variety of control options
- Easily cleanable in-situ

T-Line 120 TLL Page 216



High Temperature

	Model	Volume* m^3/s	NR (@ 1 m)	Noise dBA (@ 3 m)	Page
T-Line 120 TLL	TLL250/21-3	0.550	56	66	216
	TLL250/41-3	0.160	38	48	218
	TLL350/22-3	1.550	66	76	220
	TLL350/41-3	0.640	48	58	222
	TLL400/22-3	2.35	70	80	224
	TLL400/42-3	1.10	49	60	226
	TLL450/42-3	1.70	56	66	228
	TLL500/42-3	2.50	59	69	230
	TLL560/42-3	3.30	62	72	232
	TLL630/42-3	4.70	66	76	234
	TLL630/62-3	2.80	55	66	236
	TLL710/42-3	6.80	68	79	238
	TLL710/62-3	4.20	58	69	240
	TLL800/42-3	10.90	74	85	242

* Full fan speed volume at 150 Pa working pressure

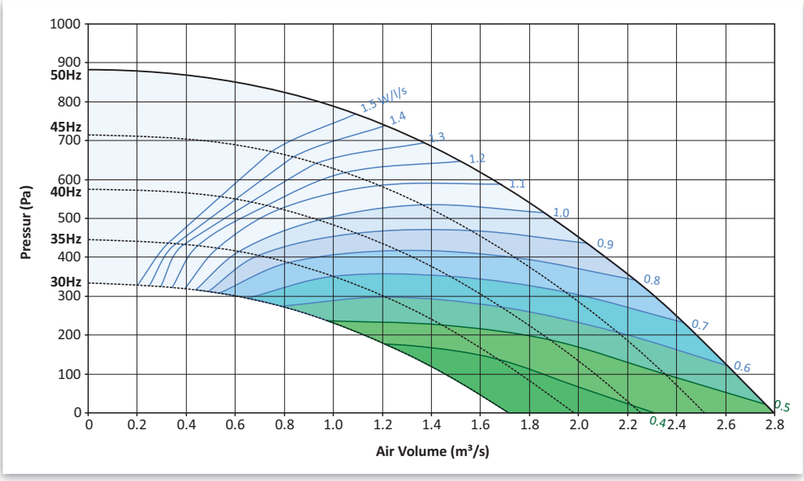
t-line 120 high temperature

T-Line 120
Versatile Extract Unit

Selection Data

Unit Size TLL500/42-3

A. Performance



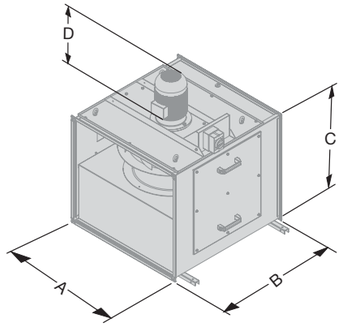
Size	Phase	Motor Power kW	Voltage Vac	Fan Speed rpm	Motor Full Load Current A	Speed Control
500	3	1.5	400	1430	3.4	Inverter

B. Configuration

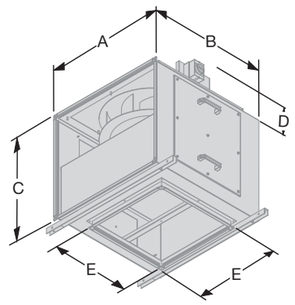
Configuration

TLL500 / 42-3 / PH PL WH WL

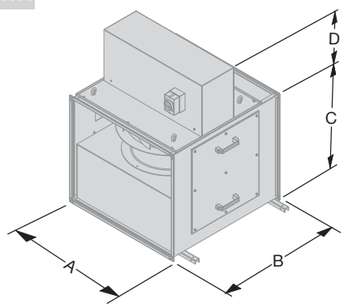
PH



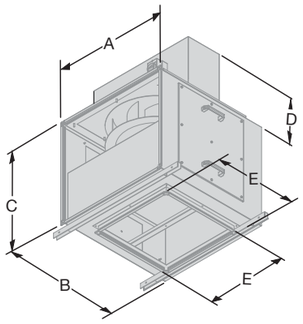
PL



WH



WL



C. Sound Data and Silencer Option

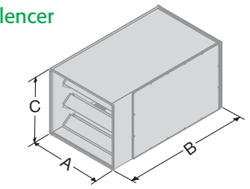
Fan Speed Setting Hz	Fan Speed rpm	Sound Spectrum dB re 10^{-12} W PWL Centre Frequency Hz								Casing Noise Breakout			
		63	125	250	500	1k	2k	4k	8k	NR@1m	NR@3m	dBA@1m	dBA@3m
50	1430	74	78	82	82	78	73	69	64	59	51	59	52
45	1287	72	76	79	79	75	71	66	62	56	48	56	49
40	1144	70	73	77	76	72	68	63	59	53	46	54	47
35	1001	67	70	73	73	69	64	60	55	49	42	50	43
30	858	64	67	70	70	66	61	57	52	46	38	47	40

Centre Frequency	63	125	250	500	1k	2k	4k	8k
Case Insertion Loss	-9	-14	-21	-27	-32	-37	-43	-42

Silencer Option	Sound Spectrum dB re 10^{-12} W PWL Centre Frequency Hz							
TLLVA500/1500	63	125	250	500	1k	2k	4k	8k
Induct Loss	-4	-7	-14	-24	-30	-30	-17	-10

Dimensions mm	A	B	C	Weight kg
	800	1500	700	120

Silencer



Note: For weatherproof and other non-standard variants please refer to silencer section of catalogue.

D. Dimensions

Unit Type	Dimensions mm					Weight kg
	A	B	C	D	E	
TLL500 Plantroom Horizontal Inlet and Outlet (PH)	800	800	700	267	-	105
TLL500 Plantroom Bottom Inlet, Horizontal Outlet (PL)	800	800	700	267	600	105
	A	B	C	D	E	
TLL500 Weatherproof Horizontal Inlet and Outlet (WH)	800	800	700	350	-	105
TLL500 Weatherproof Bottom Inlet, Horizontal Outlet (WL)	800	800	700	350	600	105

Note: Data for design guidance only. For full details, outline drawings are available upon request.

Note: Data for design guidance only. For full details, outline drawings are available upon request.

Appendix B. Information Required to Support Planning Applications for Commercial Kitchen Exhaust Systems

Appendix A - Information Required to Support Planning Applications for Commercial Kitchen Exhaust Systems

This form has been developed in line with the Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems – DEFRA 2005

The following points from the guidance should be adhered to:

- The aim of any ventilation/extraction is to ensure that no nuisance, disturbance of loss of amenity is caused by odour, fumes, food droplets or noise to nearby properties.
- A suitably qualified and experienced person with specialist knowledge of ventilation schemes should undertake the design and installation of a ventilation system.
- In circumstances where the end user of the premises is unknown, or where the specific type of food to be cooked is unknown, the installation should be designed to achieve the highest level of odour control in order to cater for a worst case scenario.

Information Required:

1. Information on Premises - No of meals to be served per day. - Method of preparation and cooking. - Type of food served.	- Breakfast, Lunch & Dinner - On site via gas and electric equipment. - Please refer to below link www.evelynscafebar.com/#gallery
2. Plans and Drawings - Scaled plan showing internal arrangement of premises and dimensions/location of the ventilation system. - Scaled plan showing dimensions and route of external exhaust duct work. The location and type of all filters and the location of the fan must be clearly marked.	- Please refer to separate plans provided with the Kitchen Extract Report. - Please refer to separate plans provided with the Kitchen Extract Report.
3. Pre-filters - Copy of manufacturer's product data sheet. - Dimensions and nature of pre-filter media. - Manufacturer's recommendations on frequency and type of maintenance.	- Canopy design together with the pre- filters TBC at later stage. - Baffle type filtration is to be considered as per the Kitchen Extract Report.
4. Electrostatic precipitators (where proposed) - Copy of manufacturer's product data sheet. - Dimensions of ESP and flow rate rating. - Manufacturer's recommendations on frequency and type of maintenance.	- Plasmaclean Elextrostatix ESP technical data attached within the Kitchen Extract Report.
5. Carbon filters (where proposed)	

- Copy of manufacturer's product data sheet. - Dimensions on filter panel. - No. of filter panels in filter bed. - Nature of carbon (including product type). - Frequency of replacement of units. - Dwell time.	- Carbon filters are deemed not necessary.
6. Odour counteractant or neutralizing system (where proposed) - Copy of manufacturer's product data sheet. - Counteractant or neutralizing chemical to be used. - COSHH data sheets for chemical to be used.	- Plasma Clean Xtract2100 ozone neutralizer technical data attached within the Kitchen Extract Report.
7. Cooker Head - Length the cooker hood overhangs the appliances.	- Detailed kitchen design is yet to be provided by the prospective tenant.
8. System operation - Extract rate in m3/s	- Current provision for 3.75m3/s and TBC following further detailed design.
9. Flue Design - Height and velocity of final discharge. Discharge should be min. 1m above roof ridge level. Where this is not possible additional filters will be required. Final discharge should be vertically upwards and unimpeded by flue terminals.	- Final discharge at approx 18.5m above the ground level. - Terminal velocity is envisaged to be between 10-15 m/s. - Final discharge to terminate vertically at minimum 1m above the roof eave level.
10. Maintenance Schedule of maintenance must be provided including details for: - Cleaning of washable grease filters. - Frequency of inspection and replacement of all filters proposed. - Inspection and servicing of fans.	- Maintenance is yet to be established based on the detailed design and is a subject to the kitchen usage (currently envisaged to be every 6 months). - Applicant is to employ a specialist cleaning company for maintaining the kitchen extract system and apparatus.

Additional Notes:

- Air inlets must not permit pests to enter kitchen (e.g. fly screens can be used).
- Cleaning method and access being developed with a cleaning specialist.
- The method for supplying make up air into the kitchen must not result in its contamination (e.g. separate provision must be made for ventilation of a toilet).
- Fresh air intake will be separated from any exhaust or stale air terminals.
- There must be sufficient access points to permit adequate cleaning of all the ductwork.
- Fresh air inlet will be provided with a bird and vermin mesh.