

1. Kitchen Ventilation Systems Description

1.1 Pizza Oven and Fryer Extract Ventilation System

The pizza oven manufacturers do not specify an extract air rate, so with the outlet size of 250mm dia, an extract rate of $0.287\text{m}^3/\text{s}$ has been calculated, which, along with a calculated extract rate of $0.213\text{m}^3/\text{s}$ for the fryer canopy,

The total extract volume is $0.5\text{m}^3/\text{s}$ with duct velocities, no higher than 6.75m/s

The DEFRA risk assessment for the pizza extract system, would indicate a high level of odour control, due to exhaust being at low level.

The pizza oven extract fan would be a Flakt Woods Estoc Targe (Powerbox) model 67-450-1, high temperature rated with the motor out of the airstream, and with an external pressure availability of 500pa, however, once the final ductwork route has been established/confirmed, the system pressure should be recalculated, if different from the design drawing layout,

The fan should have a high temperature rated sound attenuator at the inlet and the outlet of the extract fan.

The fan should have a speed controller.

Extract ventilation ductwork, would be stainless steel, double skinned with insulation between the 2 x skins.

The internal diameter of the ductwork from the fryer canopy should be 200mm diameter, increasing to 315mm dia when the pizza oven exhaust is joined to the system

The 2 x fryers will be positioned under a canopy/hood, manufactured from 20swg 304 grade stainless steel, with a continuous perimeter condense channel, standard baffle type grease filters to the rear elevation, and a high temperature rated LED strip light within

The open end of the extract ductwork, above the canopy, would also include a counterbalanced air-dilution inlet damper.

The ductwork should include sufficient access/cleaning doors or removable cap ends, for internal cleaning of the ductwork system

The stainless steel ductwork system should be supported via the brackets specified by the manufacturers of the stainless steel ductwork.

Odour Control will include 1 x UVO1000 module with a 150mm dia duct connection, 2 x ESP1500 modules in a 'double pass' configuration, and a carbon filter module, containing 6 x site safe carbon cassettes, each cassette measuring 600mm x 600mm x 200mm (nominal) and contained in a purpose built housing.

The odour control equipment should be manufactured by Purified Air Ltd

The exhaust terminal, should be an open duct, clamped to the inner face of the perforated wall cladding, should have an overall width of 300mm, and a height of 1350mm, to ensure an exhaust velocity of approx. 2.5m/s

1.2 Fresh (replacement) Air Ventilation System

As the pizza oven is gas fired, DEFRA guidelines call for fresh replacement air ventilation, at a rate of 80% of the extract air, so the fresh air volume is calculated at $0.4\text{m}^3/\text{s}$

The fresh air fan would be a Flakt Woods 31 Maxfan Compact. model 315mm dia with an external pressure availability of 180pa, however, once the final ductwork route has been established/confirmed, the system pressure should be recalculated, if different from the design drawing layout,

The fan should have a sound attenuator at the inlet and the outlet, and have a speed controller.

The fresh air ductwork would be manufactured and installed in accordance with the HVCA DW144 specification, with access doors at each item of equipment.

Air would be supplied to the kitchen via 2 x supply grilles, as shown on the design drawing No C705/1

The system should have an in-line electric heater battery, with fully integrated controls, that can raise $0.4\text{m}^3/\text{s}$ of air by 21°C

The heater should have a temperature/air pressure probe, to allow the heater to be activated when there is proven airflow, and to stop the heater from operating when a set duct temperature of $+20^\circ\text{C}$ is measured.

A standard G4 filter module, to prevent ingress of insects/dust should be positioned between the intake louver and the electric heater.

The intake louver should be an open duct, clamped to the inner face of the perforated wall cladding, should have an overall width of 300mm, and a height of 1350mm, to ensure an intake velocity of approx. 2.0m/s

2. CO detection system

As the kitchen cookline includes charcoal fired equipment, it is a requirement to have a CO (Carbon Monoxide) detection and safety system installed.

This will comprise a CO detection panel, with a 'CO Sniffer' and a visual and audible alarm.

The panel will be connected to the extract fan, and if the CO detector senses a high level of CO, and the extract fan is not operating, a visual and audible alarm will sound, and the extract fan will be activated.

The fan will continue to run, until the CO level is reduced, and is detected by the panel.

If the extract fan is already operating, and the CO safety panel detects a high level of CO, a visual and audible alarm will be activated, to alert personnel that there may be an additional source of CO that should be investigated.

3. Extract and Fresh Air rates calculations

The Canopy extract air rate, has been calculated, in accordance with DEFRA Guidelines section 4.2.2 Thermal Convection Method.

The total cookline calculation is indicated on the flow rates data sheets

Existing Canopy extract rate is calculated at $1.915\text{m}^3/\text{s}$

Island Canopy extract rate is calculated at $1.085\text{m}^3/\text{s}$

Fryer Canopy extract rate is calculated at $0.796\text{m}^3/\text{s}$

Total kitchen extract rate is therefore $3.796\text{m}^3/\text{s}$

The fresh Air replacement rate is calculated as 80% of the extract air rate,

Therefore the fresh air replacement airflow rate is:-

$$3.796\text{m}^3/\text{s} \times 0.8 = 3.0368\text{m}^3/\text{s}$$

System Static Pressure (in pascals) calculations are based on the design drawing, and are as per the following calculation sheets. Final system pressure calculations will be necessary when fully Coordinated installation drawings are produced.

4.0 DEFRA Risk Assessment

A site survey was carried out on 12th October 2022, and all items on the DEFRA risk assessment form were investigated and assessed.

Kitchen Extract

Dispersion will be high level, 1.0m above eaves, 15m/s scored **5**

Proximity of Receptors was assessed to be between 20m and 100m and receptors are both residential and commercial , it was subsequently scored **5**

Size of Kitchen falls into the large size of kitchen, over 100 covers, so scores **5**

Cooking type is Japanese and Pizza so scored **4**

Total Score is **19** which falls into the 'low level' of odour control, so it is proposed to install a UVO1000 module to each of the 3 x canopies

5. Fresh Air Ventilation Equipment details

Fresh Air Fan will be a Flakt Woods ePowerbox 80-630-3-4

Data sheet enclosed, however system pressure estimated at 450pa, and will be re-calculated once final installation drawing completed.

Sound attenuators will be as manufactured by Northern Fans Ltd, and will be the equivalent to 2 x Diameter, (no internal pod) and indicated in the red box on the enclosed data sheets.

Heater Battery should be mains electrical powered, with integral controls, and capable of raising 3.04m³/s by 20°C which will allow for an ambient of -5°C

Filter Module will be manufactured to accommodate G4 filter panels as manufactured by Camfil Ltd.

6. Extract Ventilation & Odour Control Equipment details

Kitchen Extract Fan will be Flakt Woods Estoc Targe

(powerBox 102-630-3)

Data sheet enclosed, however system pressure estimated at 700pa, and will be re-calculated once final installation drawing completed.

Sound attenuator will as manufactured by Northern Fans Ltd, and will be the equivalent to 2 x Diameter, (no internal pod) and indicated in the red box on enclosed data sheets.

UVO1000 modules will be as manufactured by Purified Air Ltd

7.0 Cookline Equipment Data

Canopy 1 – Existing

1 x 20 Grid Combination Oven 38.5KW

1 x Twin Pan Fryer 15KW

1 X MKN Flexichef 35KW

1 x Griddle 4.4KW

1 x Gyoza Grill 1.4KW

Island Canopy (Ramen A &B)

6 x Induction Hobs 6KW each – 36KW Total

2 x Noodle Cookers 7KW each – 14KW Total

2 x Yakitori Grills estimated 3KW each – note these are charcoal

Frying Canopy

1 x Griddle 4.4KW

2 x Twin Pan Fryers 15KW each – 30KW

4 x Gyoza Griddle 1.4KW each – 5.6KW

1 x Slimline Combi 7.8KW

SWAN

38 Stanway Road
Whitefield
MANCHESTER
M45 8FX

DEFRA Risk Assessment

Project No:- **C726**

Project Name:- **HOUSE of FU**

Site Address:- **PORTLAND ST. MANCHESTER**

Date:- **12-10-22**

19

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

based on the sum of contributions from dispersion, proximity of receptors, size of kitchen and cooking type:

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.

Design Brief

for

Kitchen Ventilation Systems

at

**House of FU
113-115 Portland Street
Manchester**

for

**Multi Trade Plus Ltd
91-93 Manchester Road,
Unit 6 Hawksley Industrial Estate
Oldham
OL8 4PB**

by

SWAN Projects

38 Stanway Road
Whitefield
Manchester
M45 8FX



Northern Fan Supplies Ltd

Technical Data Sheet

Estoc Targe - Powerbox GF



Quotation Number	: KP72480	Project Code	:
Project Name	: Peter Street	Customer	: Swan
Item Reference:	: Extract	Date:	: Wednesday, October 19, 2022

Fan Code	Estoc Targe (PowerBox) 102-630-3
Fan Diameter / Size	630
Velocity	12.2 m/s
Form of Running	B (Horizontal)

Requested Duty (47.1 Hz)	3.8m³/s @ 700 Pa (static)
Control Adjustment	47.1 Hz
Outlet Dynamic Pressure	89 Pa

Duty Shaft Power	4.92 kW
Max Shaft Power	5.73 kW

Motor Frame	Integral [Class F]
Motor Rating	6.00 kW
Full Load Current	10.8 A
Starting Current	62.64 A
Electrical Supply	380-420 Volts 50 Hz 3 Phase
Start Type	Enquire
Motor Winding	Standard

ErP [FMEG] Rating	Not in Scope
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SFP value	1.29 W/(l/s) @ Requested Duty
Power from mains	4.92 kW
Energy Consumption	14747 kWh (3000 h/year)
Running Cost / Year	£1770

Air Density	1.2 kg/m³ / 20 °C / 0 m / 50% RH
Smoke Venting	Non Smoke Venting
Product Number	GF106303

Acoustic figures for adjusted running speeds have been interpolated and are for reference only.

This Offer is made subject to the latest version of our A100-19 Terms and Conditions, a copy of which can be made available on request. Our lead times will be re-confirmed on receipt of manufacturing release and may be subject to change.

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	115	82	85	81	82	84	79	72	115	71
Outlet*	118	90	88	87	86	85	81	72	118	74
Breakout*	101	82	78	69	69	63	56	50	101	57

* Lw dB re 10⁻¹² W

** dBA re 2x10⁻⁵ Pa

Sound data at requested duty.

Description	Qty
Fan GF106303 - Estoc Targe (PowerBox) 102-630-3 Accessories	1



Northern Fan Supplies Ltd

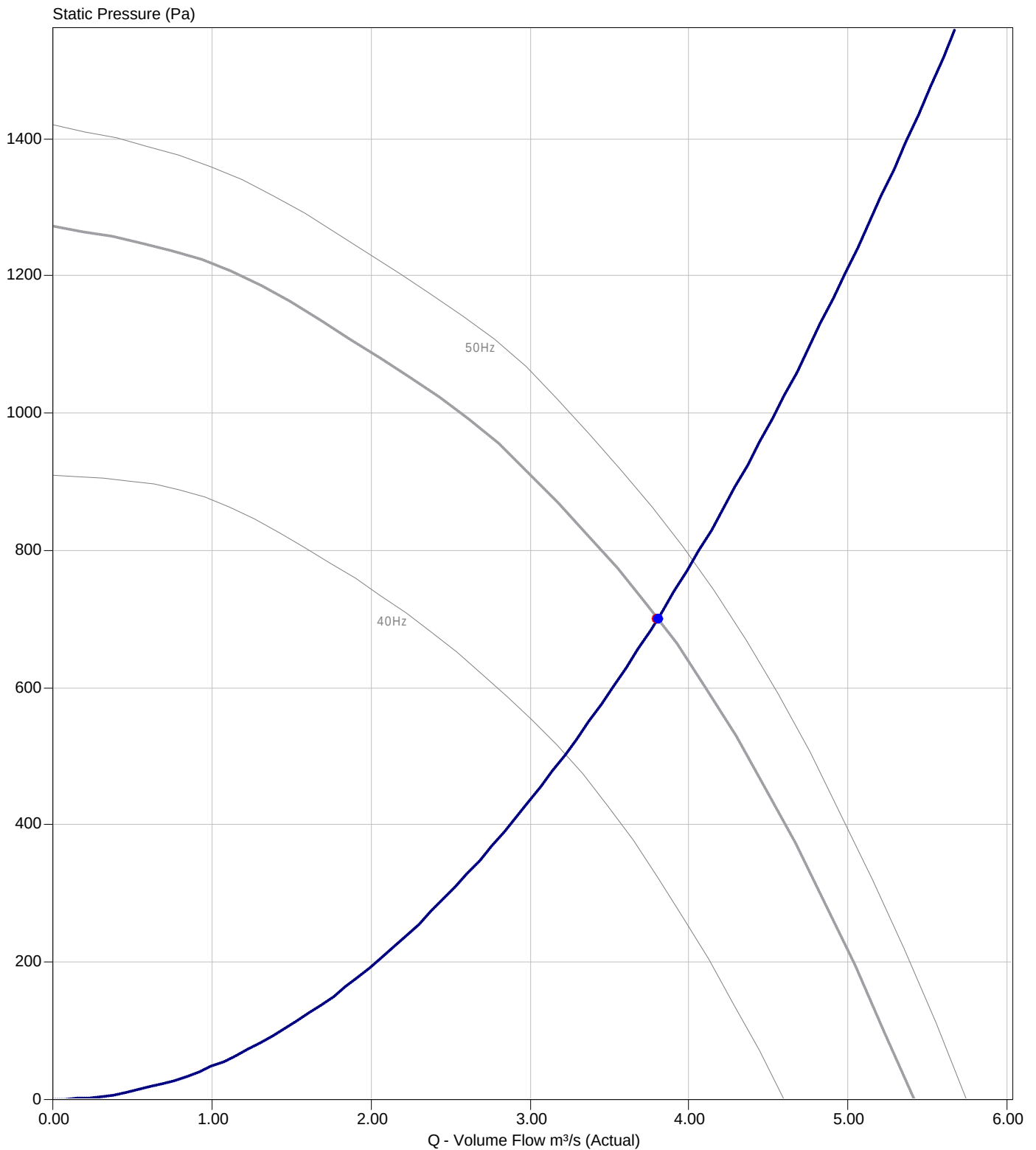
Performance Chart

Estoc Targe - Powerbox GF



Quotation Number : KP72480
Project Name : Peter Street
Item Reference: : Extract

Project Code :
Customer : Swan
Date: : Wednesday, October 19, 2022
Fan Code : Estoc Targe (PowerBox) 102-630-3





Quotation Number : KP72480

Project Name : Peter Street

Item Reference: : Extract

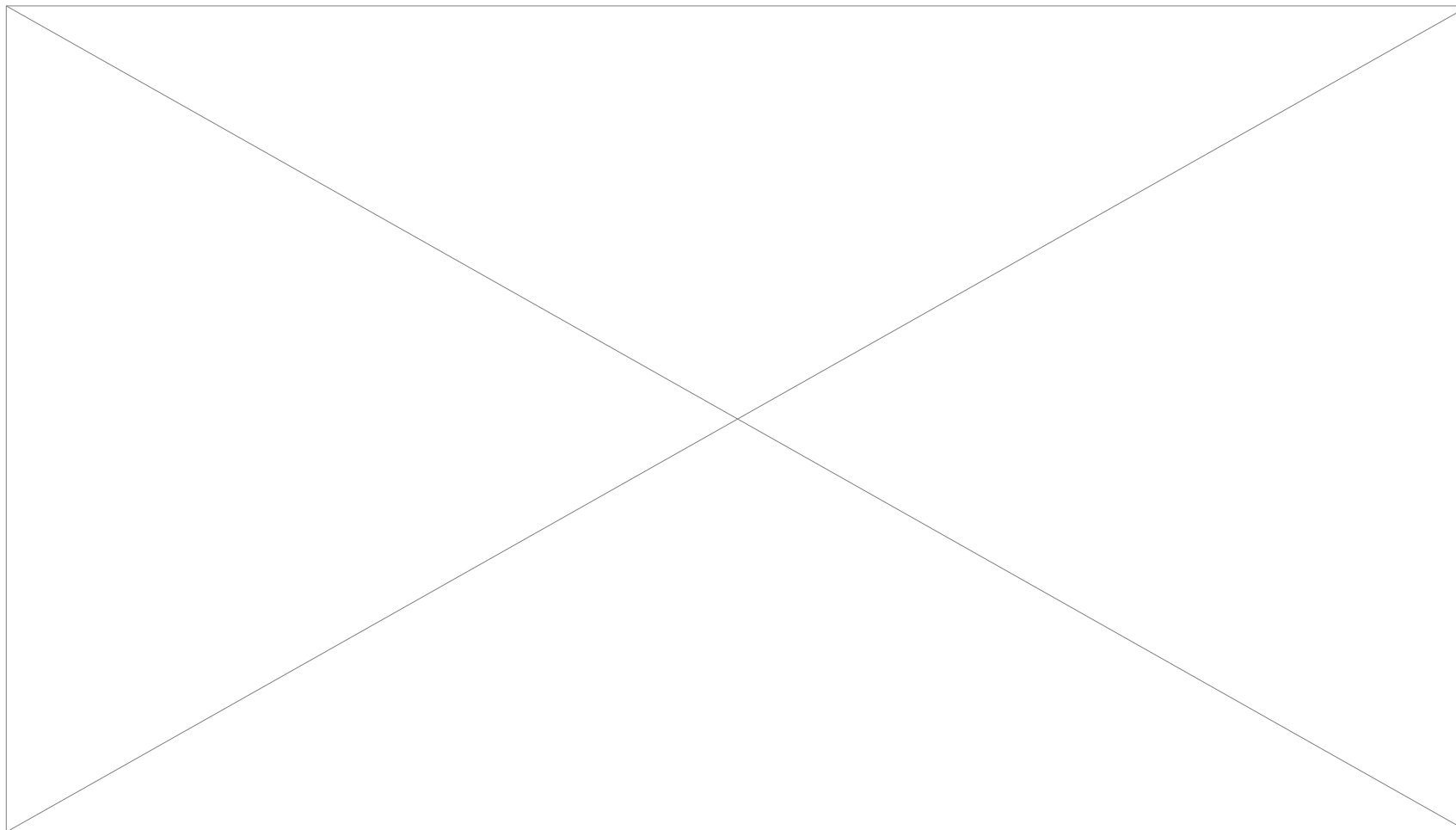
Fan Code : Estoc Targe (PowerBox) 102-630-3

Customer : Swan

Date: : Wednesday, October 19, 2022

Max Weight (kg)

165



Notes : Dim in mm / Weight in kg / * Outlet dim

Reference :Catalogue drawing

This drawing shows dimensions that should be used as a guide only and are subject to change. Certified drawings are available on request.

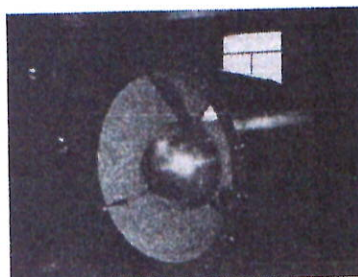
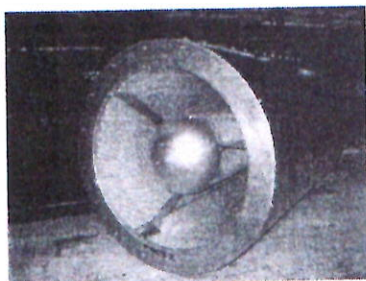
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STANDARD CIRCULAR SILENCER INSERTION LOSS DATA

@ +20°C and 5m/sec FACE VELOCITY

SILENCER SIZE	CODE	P.A	OCTAVE BAND CENTRE FREQUENCIES (Hz)							
			63	125	250	500	1K	2K	4K	8K
200-550 dia	CDA.1D	ALL	2	4	6	10	14	10	7	8
		A	4	8	13	17	23	17	12	11
		B	4	8	12	17	23	17	12	10
	CDA.2D	C	4	7	10	15	19	16	12	9
		A	4	6	8	12	21	21	18	15
		B	4	6	8	11	18	19	17	14
	CDAP.1D	C	4	6	8	11	14	16	11	10
		A	7	10	12	24	29	29	27	23
		B	7	10	12	21	26	26	24	22
	CDAP.2D	C	7	10	11	18	21	20	17	15
		ALL	3	4	9	15	15	8	7	6
		A	6	8	13	22	23	14	13	9
600-800 dia	CDA.1D	B	6	8	13	22	22	13	12	9
		C	6	8	12	20	18	13	11	9
		A	4	6	8	17	25	21	18	11
	CDA.2D	B	4	6	8	17	23	20	18	10
		C	4	6	8	16	18	16	13	10
		A	8	11	16	30	35	31	29	22
	CDAP.1D	B	8	11	16	27	32	31	29	19
		C	8	11	16	24	23	22	21	17
		ALL	3	4	9	14	13	7	7	6
	CDA.2D	A	6	8	14	22	20	13	12	9
		B	6	8	13	21	18	12	11	9
		C	6	8	12	19	16	11	10	7
1000-1500 dia	CDA.1D	A	4	6	11	21	20	16	13	11
		B	4	6	11	20	18	15	13	11
		C	4	6	11	17	16	14	12	10
	CDA.2D	A	8	11	18	30	32	30	24	16
		B	8	11	18	26	27	26	22	16
		C	8	11	18	21	20	22	20	16
	CDAP.1D	ALL	4	5	10	14	11	6	6	5
		A	8	9	14	19	18	12	11	9
		B	8	9	14	19	17	11	10	9
	CDA.2D	C	8	9	13	18	14	10	9	8
		A	5	7	12	21	20	13	12	9
		B	5	7	12	19	18	13	11	9
1600-2000 dia	CDA.1D	C	5	7	12	15	16	12	10	8
		A	10	14	21	26	29	28	18	15
		B	10	14	21	25	27	25	16	14
	CDA.2D	C	10	14	21	21	20	20	15	14

EXTRACT FAN

P.A = Fan Impeller Pitch Angle.

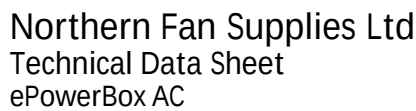
A = upto 12 degrees

B = upto 20 degrees

C = upto 45 degrees

The Above Data Is Offered As Being Indicative Only

For Guaranteed Data (when applicable) Please Consult With (DBA) Technical Services Ltd.



Quotation Number	: KP72480	Project Code	:
Project Name	: PeterStreet	Customer	: Swan
Item Reference:	:	Date:	: Wednesday, October 19, 2022

Fan Code	ePowerBox 80-630-3-4 (7NA)
Fan Diameter / Size	630
Velocity	9.6 m/s
Form of Running	B (Horizontal)

Requested Duty (360V)	3m ³ /s @ 450 Pa (static)
Control Adjustment	360V
Outlet Dynamic Pressure	56 Pa

Duty Shaft Power	2.95 kW
Max Shaft Power	3.28 kW

Motor Frame	Integral [Class F]
Motor Rating	3.28 kW
Full Load Current	6.1 A
Starting Current	34.16 A
Electrical Supply	380-420 Volts 50 Hz 3 Phase
Start Type	Enquire
Motor Winding	Standard

Regulation 1253/2014	
UVU Efficiency	56.7%
UVU Target Efficiency	49.2%
Nominal Flow Rate	2.25 m³/s @ 800 Pa
Effective Input Power	3.21 kW
Nominal RPM	1387 rpm

SFP value	0.98 W/(l/s) @ Requested Duty
Power from mains	2.95 kW
Energy Consumption	8854 kWh (3000 h/year)
Running Cost / Year	£1062

Air Density	1.2 kg/m ³ / 20 °C / 0 m / 50% RH
Smoke Venting	Non Smoke Venting
Product Number	BI101234

Acoustic figures for adjusted running speeds have been interpolated and are for reference only.

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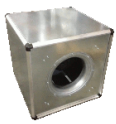
	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	-	87	81	79	74	73	70	66	89	61
Outlet*	-	92	89	85	81	78	73	68	95	67
Breakout*	-	83	75	60	55	52	48	44	84	50

* Lw dB re 10^{-12} W

** dBA re 2×10^{-5} Pa

Sound data at requested duty.

Description	Qty
Fan BI101234 - ePowerBox 80-630-3-4 (7NA) Accessories	1



Northern Fan Supplies Ltd

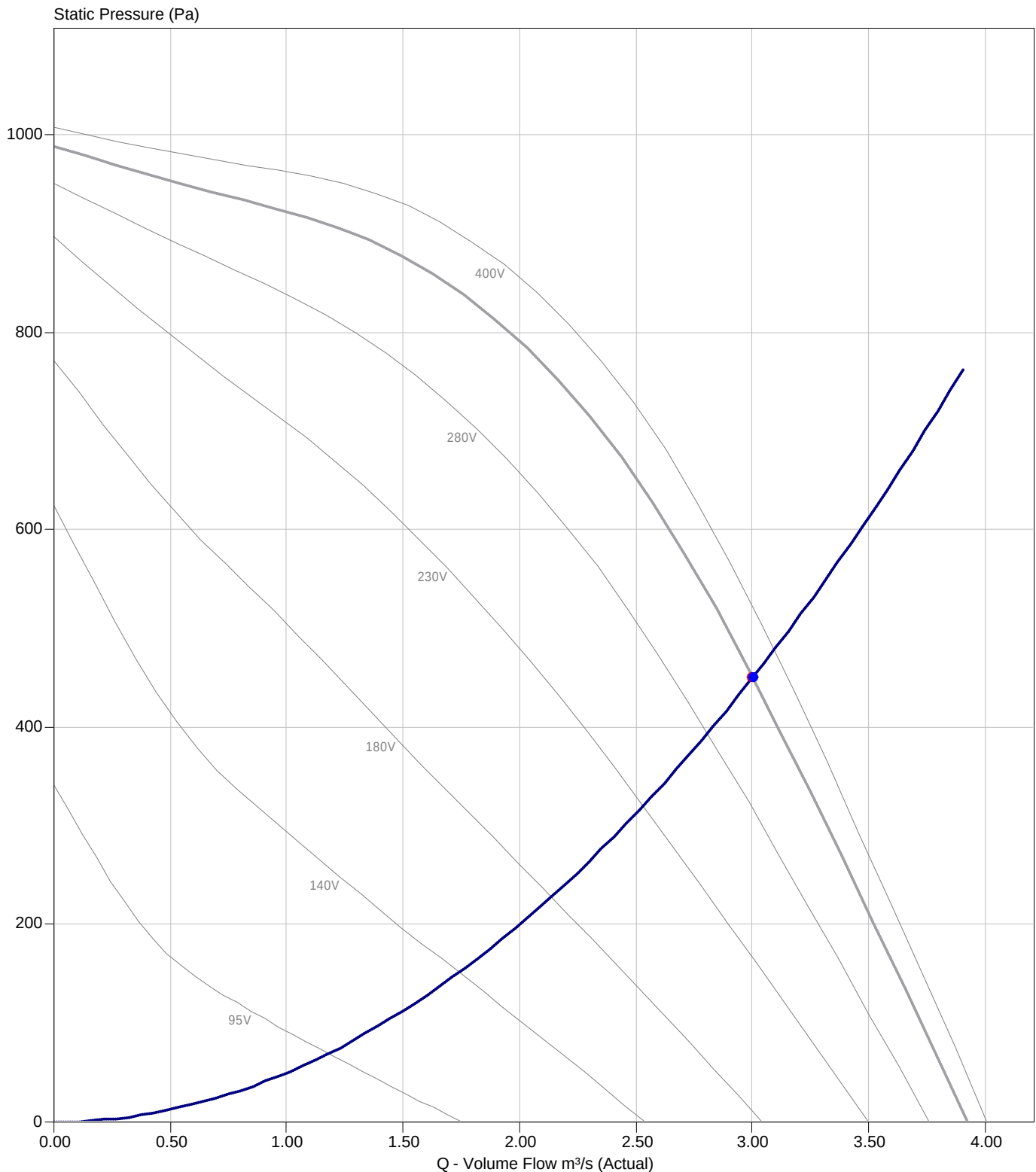
Performance Chart

ePowerBox AC



Quotation Number : KP72480
Project Name : Peter Street
Item Reference: :

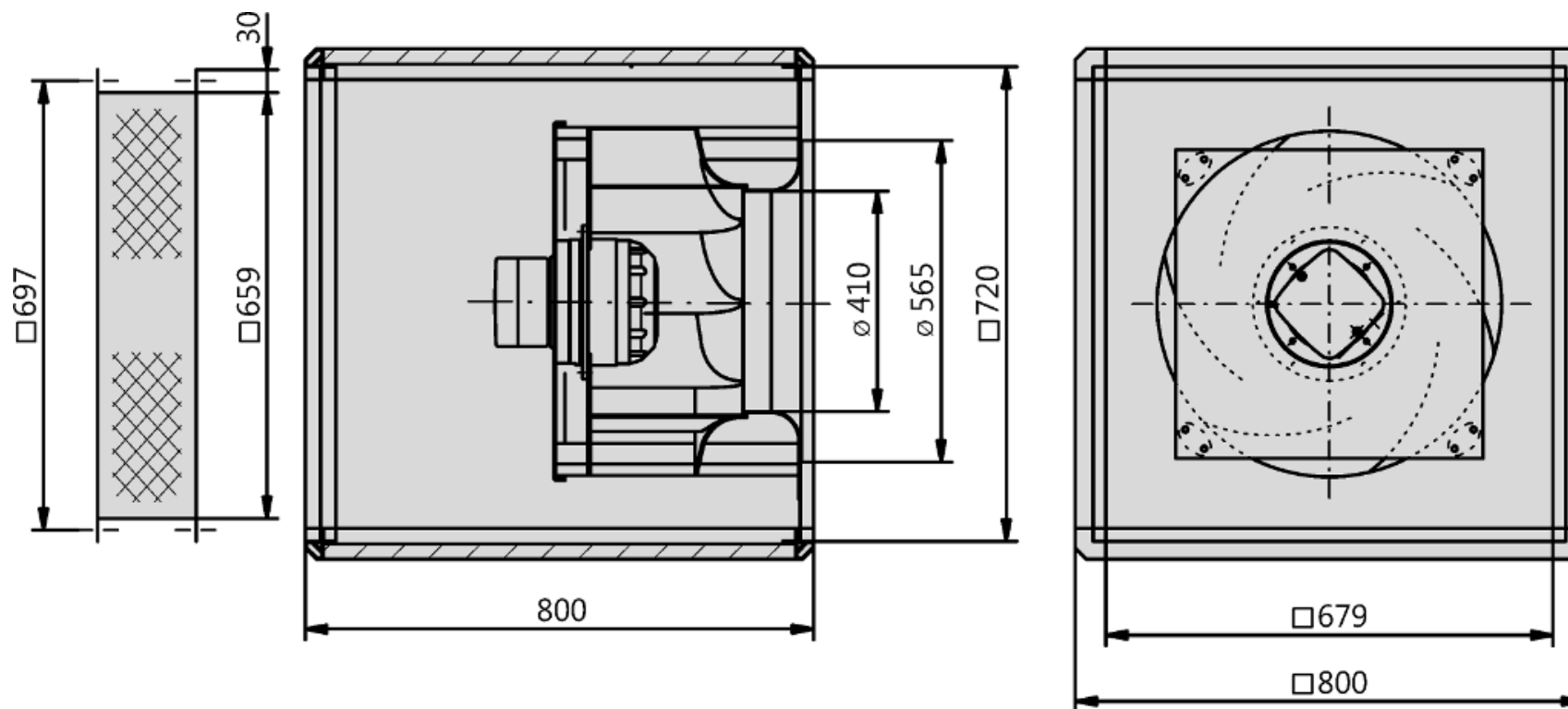
Project Code :
Customer : Swan
Date: : Wednesday, October 19, 2022
Fan Code : ePowerBox 80-630-3-4 (7NA)





Quotation Number : KP72480
Project Name : Peter Street
Item Reference: :

Fan Code : ePowerBox 80-630-3-4 (7NA)
Customer : Swan
Date: : Wednesday, October 19, 2022



Notes : Dimensions shown in mm / Weight in kg

Reference :Catalogue drawing

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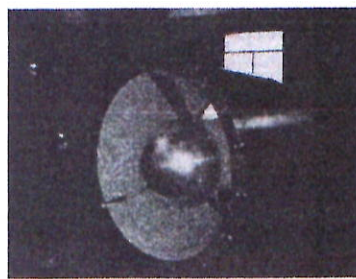
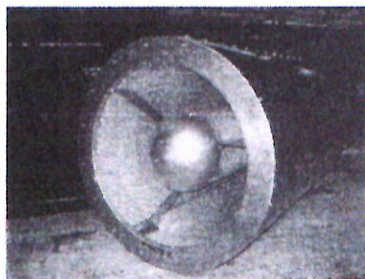
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@ +20oC and 5m/sec FACE VELOCITY

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	CDA.2D	A	4	8	13	17	23	17	12	11	
		B	4	8	12	17	23	17	12	10	
		C	4	7	10	15	19	16	12	9	
	CDAP.1D	A	4	6	8	12	21	21	18	15	
		B	4	6	8	11	18	19	17	14	
		C	4	6	8	11	14	16	11	10	
	CDAP.2D	A	7	10	12	24	29	29	27	23	
		B	7	10	12	21	26	26	24	22	
		C	7	10	11	18	21	20	17	15	
	600-800 dia	CDA.1D	ALL	3	4	9	15	15	8	7	6
		CDA.2D	A	6	8	13	22	23	14	13	9
		B	6	8	13	22	22	13	12	9	
		C	6	8	12	20	18	13	11	9	
CDAP.1D		A	4	6	8	17	25	21	18	11	
		B	4	6	8	17	23	20	18	10	
		C	4	6	8	16	18	16	13	10	
CDAP.2D		A	8	11	16	30	35	31	29	22	
		B	8	11	16	27	32	31	29	19	
		C	8	11	16	24	23	22	21	17	
1000-1500 dia		CDA.1D	ALL	3	4	9	14	13	7	7	6
		CDA.2D	A	6	8	14	22	20	13	12	9
		B	6	8	13	21	18	12	11	9	
		C	6	8	12	19	16	11	10	7	
	CDAP.1D	A	4	6	11	21	20	16	13	11	
		B	4	6	11	20	18	15	13	11	
		C	4	6	11	17	16	14	12	10	
	CDAP.2D	A	8	11	18	30	32	30	24	16	
		B	8	11	18	26	27	26	22	16	
		C	8	11	18	21	20	22	20	16	
	1600-2000 dia	CDA.1D	ALL	4	5	10	14	11	6	6	5
		CDA.2D	A	8	9	14	19	18	12	11	9
		B	8	9	14	19	17	11	10	9	
		C	8	9	13	18	14	10	9	8	
CDAP.1D		A	5	7	12	21	20	13	12	9	
		B	5	7	12	19	18	13	11	9	
		C	5	7	12	15	16	12	10	8	
CDAP.2D		A	10	14	21	26	29	28	18	15	
		B	10	14	21	25	27	25	16	14	
		C	10	14	21	21	20	20	15	14	

FRESH AIR FAN

P.A = Fan Impeller Pitch Angle.

A = upto 12 degrees

B = upto 20 degrees

C = upto 45 degrees

The Above Data Is Offered As Being Indicative Only

For Guaranteed Data (when applicable) Please Consult With (DBA) Technical Services Ltd.

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 m³/sec of air flow
- UV-C 1000 which handles up to 2 m³/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.

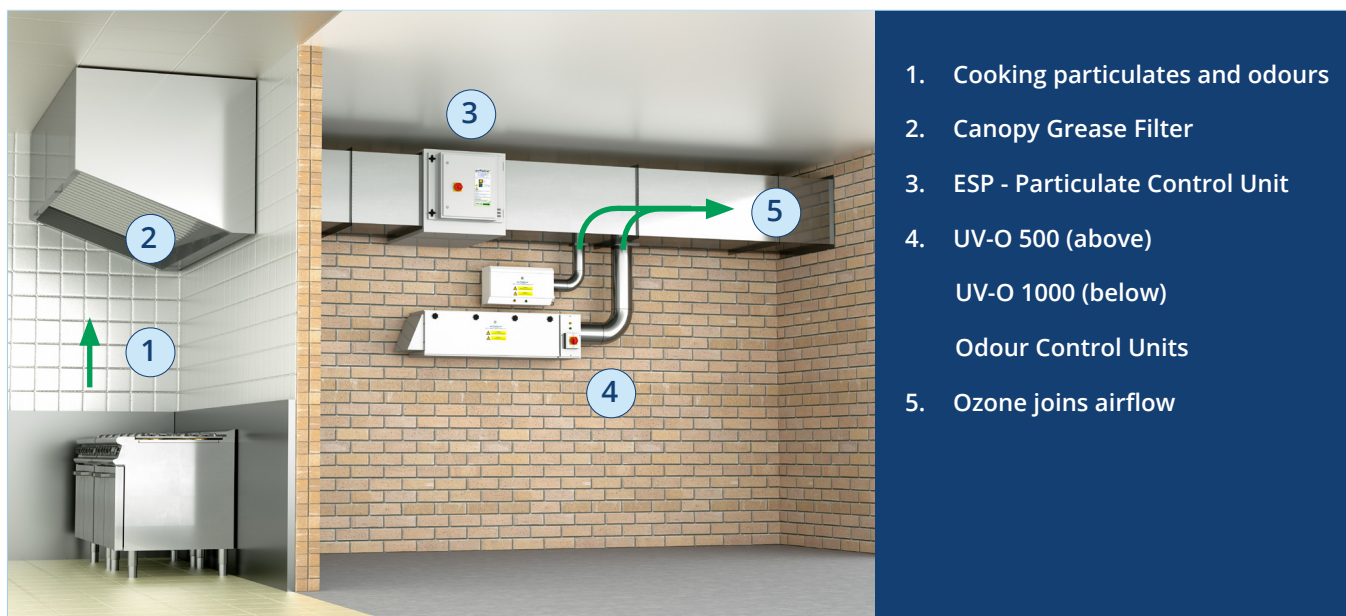
For optimum performance we would recommend between 2 & 6 seconds of dwell time to allow the ozone to work effectively upon the malodorous gasses within the duct.



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	120 Watts	700 Watts
Max Air Volume	up to 1m ³ /sec	up to 2m ³ /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.