

POWERED VENTILATION LTD.

Kitchen Extract system Solutions

www.poweredventilation.co.uk

SITE REF:
936-938 STOCKPORT ROAD,
MANCHESTER,
M19 3NN,

PLANNING REF No:

DATE: 08/08/23

CALCULATION STATEMENT ON PROPOSED EXTRACT SYSTEM:

SPECIFICATION

Canopy Hoods Details

Dimensions hood (A) 4500 x 1100 x 400 / 500

Dimensions hood (B) 3500 x 1100 x 400 / 500

Dimensions hood (C) 4000 x 1100 x 400 / 500

The canopy's will be manufactured from stainless steel grade 430, with grease drain off taps on either sides of the extract hoods. The canopy hoods will be supplied with stainless steel baffle filters.

Face velocity hood (A) = 3.85m/s

Design volume = 1.54m³/sec (medium / heavy load)

6 off stainless steel baffle filters (cook face area)

Face velocity hood (B) = 2.31m/s

Design volume = 0.81m³/sec (medium load)

4 off stainless steel baffle filters (cook face area)

Face velocity hood (C) = 4.40m/s

Design volume = 1.98m³/sec (medium / heavy load)

8 off stainless steel baffle filters (cook face area)

Combined Design Volume: 4.33m³/sec

Total number of grease filters per hood (A) / (B) / (C) = 24 / Dimensions 495*495*45

Design Volume 4.33m³/s / 18 = 0.24m³/s

4.33m³/s / 0.24m³/s = 18.04

18 off stainless steel baffle filters (between hoods (A / 9) / (B / 7) / (C / 8))

Combined Design Volume for hoods (A) / (B) / (C) = 4.33m³/sec (Medium / Heavy 0.40m/s /

Heavy Loading-0.51m/s

Extract Plant details & Extract duct connections for Hood (A)

The Extract duct work will connect off the top entry filter bank spigot of the 4.5mtr canopy extract hood which will go horizontal against ceiling internal of the building before connecting onto the main header of the extract duct with a volume control damper to balance off extract in order to allow correct velocity of each hood connecting onto main header.

The connections for hoods (B) and (C) will follow the same principle as connection (A) with VCD's (volume control dampers) on to the internal Odour Abatement system which will comprise of 2 No. RY7500B ESP units, before this unit's Canopy hoods (A),(B) & (C) spigots will branch onto there respective 3 No. Ozone injectors units (for further details of units see details provided by EXTECHNOLOGY EURPORE) before exiting onto the external vertical discharge riser rear of the property upon the flat roof before going onto the vertical discharge riser 1mtr above eaves. Before the vertical riser the extract duct will connect onto the external plant system which will be the extractor fans united on to attenuators and AVMS fixed and isolated which will help nullify any further transmitting noise (please see noise assessment for attenuator details and calculations provided by Acoustic Consultant), the extractor fans will be speed controlled via auto-transformer / inverter regulator which will help prevent harmonic sounds which cause fan to make when operated by electronic controllers. The vertical discharge flue will be 1metre above eaves of main building discharging at high level via a high Velocity low-loss efficiency cowl.

Extract Duct details for Hood (B)

The Extract duct work will connect off the top entry filter bank spigot of the 3.5mtr canopy extract hood which will connect to the main header of duct with the VCD as mentioned above which canopy extract hood (A) is connecting onto.

Extract Duct details for Hood (C)

The Extract duct work will connect off the top entry filter bank spigot of the 4.0mtr canopy extract hood which will connect to the main header of duct with the VCD which canopy extract hood (A) & (B) is connecting onto, to help balance the airflow and extract velocity for all three canopy extract hood and not to cause spillage volume control damper will be installed onto the spigots connecting before the main header of the extract duct for each hood as detailed in the extract layout specifics given above. The extract ductwork off all Canopy extract hoods will be internal against the ceiling.

Overall Extract Duct Work connections off Extract Hoods & Plant section details:

The extract duct work will spigot off the top filter bank section off all three Canopy Extract hoods (A) / (B) & (C), the extract duct will then horizontally internal up to Internal Odour abatement systems (ESP units & Ozone injectors) before existing onto the external rear flat roof section of the property connecting onto the external plant being the Extract fan connecting to its vertical discharge flue, the internal extract duct will be suspended against the ceiling, note: all duct and plant will be hard fixed and isolated with Anti-vibration -Mounts (AVMS) and

Dura-Dyne connectors were required also h/duty 40*40 uni-struct and M10 rod hanger supports will be used for duct and plant

support again this will be the same with the external vertical discharge flue.

The extract hoods will have a clearance of 2mtr to the front underside, the plant section will consist of Ozone & Esp units which will be internal of the building before the external extractor fan which will be united to an attenuator with anti-vibration mounts and Dura-dyne connections which will help nullify any further transmitting noise and vibrations, the extractor fans will be speed controlled via auto-transformer / inverter regulator which will help prevent harmonic sounds which cause fans to make when operated by electronic controllers, the plant will have accessible points for service and maintenance.

For aesthetic purposes the exposed vertical discharge flue can be painted to suit exterior of building colour to soften image of the gray steel finish of all general ducts (to be approved by Authority please see below two selection of RAL colour codes which can be checked via websites on RAL colours with code given for selection. (brick red / Terracotta Ral code: 3009 / matt black slate Ral code:9005 / Graphite grey Ral code:7024)

There are no real impact of this issue to the rear as it faces a main railway lines with residential premises approximately 67mtrs away from the site this is the same for the front right hand side which again has residential premises approximately 24mtrs away with the front and left hand side of the building facing onto the main road with some residential premises at a distance of 44mtrs, the remaining units closest to the site are a few abandoned closed industrial & commercial units with no residential flats within. Also as there are no open able residential windows higher than the roof ridge of the property within the location as stated above in which the Vertical Discharge flue is positioned that there would be any issues of Odour or Cooking fumes. The site its has no plans for flats above which have been planned for the restaurant private function area.

The vertical discharge flue will be of a high Velocity low-loss Discharge cowl which will be set 1mtr above main building roof ridge. The High Velocity low-loss Discharge Cowl is ideal for good dispersion of fumes.

Extract Duct Dimensions for Hood (A)

The duct work size is approximately 430*430 or equivalent spigots connections up to main header of duct.

$$1.54 / 0.18 = 8.55\text{m/second}$$

Extract Duct Dimensions for Hood (B)

The duct work size is approximately 300*300 or equivalent spigots connections up to main header of duct.

$$0.81 / 0.09 = 9.00\text{m/second}$$

Extract Duct Dimensions for Hood (C)

The duct work size is approximately 490*490 or equivalent spigots connections up to main header of duct.

$$1.98 / 0.24 = 8.25\text{m/second}$$

Duct Dimensions for Main Extract header for Extract hoods (A) / (B) & (C) and Discharge flue efflux velocity :

The main extract duct header will be required to be approximately 700*700 or equivalent up to the external plant system.

$$4.33 / 0.49 = 8.84\text{m/second}$$

The efflux velocity is 17.58m/second and the duct work will be free from grease disperse all odours to high level via 560dia or equivalent High Velocity low-loss Discharge Cowl. The vertical discharge flue will be set 1mtr above eves.

Pressure Lost in System Hood (A) / (B) & (C) :

13off, Linear Metres	@	3 pa=	39pa
7off, 90deg bends	@	10pa=	70pa
24off, Stainless Baffle Filters		=	150pa
1off, High Efficiency cowl		=	20pa
1off, Carbon unit and pre-filter		=	150pa
Total		=	429pa clean

Required duty and pressure: 4.33m³/s @ 429 pa clean / 500 pa dirty

Extract Fan Specification for hood (A) / (B) & (C) :

Fan selected: SLC-560-2-3AC CASED AXIAL FAN, 2 pole, Three phase, speed control via Inverter drive. The Extract fans will be located internal of building plant area which will be united to an attenuator and will be fixed and isolated with anti-vibration mounts and Dura-dyne connections which will help any further transmitting noise and vibrations nullify.

The two fans each run at 2900rpms each with a maximum operating noise of 77dBA and will handle air flow rate 4.33m³/s @ 900-1000 pa.

KITCHEN FRESH AIR-INLET DETAILS & CALCULATIONS :

Combined Design Volume: $4.33\text{m}^3/\text{s}$ (combined canopy hood design volumes)x 3600=
 $15,588\text{m}^3/\text{hr}$

Kitchen area volume $5.8\text{m} \times 6.1\text{m} \times 3.0\text{m} = 106.14\text{m}^3$ recommended air change rate for commercial kitchen is 30- 60 ach

The air change rate equates to $15,588\text{m}^3/\text{hr}$ divided by the Kitchen area volume 106.14m^3
This gives us an air change rate of 146.68ach. Minimum for commercial kitchen 30-60 ach, this figure can be brought down using the speed regulator.

Supply Volume Design:

With such a high air change the design would call for the maximum recommended replacement of 85%

This would be $4.33\text{m}^3/\text{s}$ ($15,588\text{m}^3/\text{hr}$) x 85% requires $3.68\text{m}^3/\text{s}$ ($13,248\text{m}^3/\text{hr}$)

Pressure Lost in Air- Supply System

Allowing for 50 pa filter /(700*700 duct =7.51m/s velocity) 150 pa duct / 50 pa grille / bends
100 = 350pa clean / 450 pa dirty

Required duty and pressure: $3.68\text{m}^3/\text{s}$ @ 450 pa dirty

Air-Supply Fan and Grill Specification

Fan selected: SLC-500-2B-3AC CASED AXIAL FAN, 2 pole, Three phase, speed control via Inverter drive. The Air-supply fan will be located internal of building plant area which will be united to an attenuator and will be fixed and isolated with anti-vibration mounts and Dura-dyne connections which will help any further transmitting noise and vibrations nullify.

This fan runs at 2900rpms with a maximum operating noise of 71dBA and will handle air flow rate in excess of $3.68\text{m}^3/\text{sec}$ @ 600pa.

Silencer Details:

PLEASE SEE ACCOUSTIC DETAILS PROVIDED BY RANDTECH CONSULTANT LTD

Odour Control Details:

(PLEASE SEE EXTECHNOLGY DOCUMENT FOR THESE ITEMS DETAILS & SPECIFICATIONS)

The Selection of ESP and Ozone is the specification contained in this document is compliant with the EMAQ+ guidelines and all agreement have been put in place to ensure that the system is maintained in accordance with the manufacturers specification and DEFRA guidelines.

The specified system will comprise of the three layers of filtration should be considered above and beyond compliant with point two detailed on page 11 of the DEFRA's guidelines under the subheading " High Level of Odour Control".

Stage One: Baffle Grease Filters

Stage Two: Electrostatic Precipitator

Stage Three: Ozone Filters

Cleaning and maintenance

The ESP / Ozone Injectors should be inspected for every 3-6 months for results in changing or service of the ESP Cells, again this will be done by Installation contractors. The service will give us a result in whether the change of the Cells or UV LAMPS should take place every 3 to 6 months to maintain its optimum efficiency however it will be also the clients duty to inform contractor of services due not to cause any fall back of issues of odour arising due to the fact of the contractors absence of notifying the client of service.

The canopy and the stainless steel baffle filters should be cleaned on a daily basis. The stainless steel baffle grease filters are of a 304 grade, the grease filters are to be cleaned on the regime and use of the kitchen, typically a grease filter is cleaned on a daily basis.

The inspection and service of the fan is required every 6 months which will have to be carried out by the Installation contractors. This again will be inspected by the installers.

We recommend that the canopy and the duct work should receive a full deep clean 6 months after installations and then every 6 months thereafter by our recommend cleaning company, to maintain the maximum efficiency of the extraction system.

The ESP Cells/pre-filters and system will be kept on a data base by the installers which will contact the user when inspection is due, the customer will have a inspection book which will be stamped after inspection and service by the Installation contractors.



Ref: MDR/J5327a

28th May 2023

Powered Ventilation Ltd

Alexander House

60 Tenby Street North

Birmingham

B1 3EG

For the attention of Mr M J Ali

Dear Sirs

Re: 936-938 Stockport Road, Manchester, M19 3NN - Proposed Kitchen Supply & Extract Ventilation Systems - External Noise Assessment

Further to the receipt of your ventilation design information, we are pleased to forward our noise assessment for the proposed kitchen supply & extract ventilation systems as follows:-

We visited the site on Saturday 27/5/23 to inspect the proposed location for the proposed ventilation systems. There is no residential use of the upper floors of the building and the nearest residential use is likely to be on adjoining buildings. For assumed residential use of adjoining buildings, the nearest residential windows will be at least 12m from the proposed extract discharge and at least 8m from the supply intake on the building. The intended operation times for the site are from 11.00hrs to 02.00hrs, 7 days a week. At 01.30hrs 28/5/23 at the small rear yard area to the rear of the site off Albert Road, the background noise level was 42.0dB LA90 30min; the background noise level was controlled by road traffic flow in the locality; there was no access to a location adjacent to rear residential windows on adjoining buildings.

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Tel 01604 451213 Mob 07966 913809 / 07772 691280 E-mail mdrand1@aol.com
www.randtech-consulting.co.uk Company Number 13751425



Ref: MDR/J5327a

The instrumentation used for the noise measurements was a Rion NL-52 precision grade real time analysing sound level meter, serial number 00976153. The instrument was calibration checked before and after the measurements and seen to be calibrated correctly. Please see the attached current certificate of calibration. The noise measurements were undertaken in satisfactory weather condition, with no significant wind or precipitation.

The design criteria we advise to be applied to the proposed ventilation systems external noise to be measured outside the nearest residential windows is to be at least 10dB below the prevailing background LA_{90} measured on 28/5/23, equating to no more than 32dBA for the supply intake @ 8m and extract discharge @ 12m combined. BS4142:2014 assessment methodology compares the background noise level with a plant rating noise level. For this site, the noise- controlled ventilation systems will have no distinct tonal characteristics or intermittency which would require correction to the plant source noise to derive a rating level. Controlling the proposed plant noise sources to be at least 10dBA below background ensures no adverse addition to the background noise level at the nearest residential window location.

For the proposed kitchen extract ventilation system, the fan discharge silencer advised would be a circular silencer with pod, typically 560mm i/d x 710mm o/d x 1680mm long. The silencer should reduce the radiated discharge noise to approximately 31dBA at 12m distance.

For the proposed kitchen supply air ventilation system, the fan intake silencer would be a circular silencer with pod, typically 500mm i/d x 650mm o/d x 2000mm long. The silencer should reduce the radiated intake noise to 26dBA at 8m distance.

The combined extract discharge noise at 12m and supply intake noise at 8m equates to 32dBA

In addition, the fans and ductwork systems should be supported off the building structure using anti-vibration mounts/hangers to avoid vibration transmission into the structure.



Ref: MDR/J5296a

We have attached our noise level design calculation sheets and supporting information for your reference.

We trust the noise assessment meets with your approval and we remain.

Yours faithfully

A handwritten signature in black ink, appearing to read 'MD Randall', written in a cursive style.

M D Randall BSc(Eng) CEng MCIBSE MIOA





CERTIFICATE OF CALIBRATION



0653

Date of Issue: 29 March 2023**Certificate Number: UCRT23/1441**

Calibrated at & Certificate issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

Milton Keynes MK5 8HL

Telephone 01908 642846 Fax 01908 642814

E-Mail: info@noise-and-vibration.co.ukWeb: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page 1 of 2 Pages
Approved Signatory
K. Mistry

Customer ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes
MK5 8HL

Order No. ANV MS HIRE

Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification	Manufacturer	Instrument	Type	Serial No. / Version
	Rion	Sound Level Meter	NL-52	00976153
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-25	76270
	Rion	Microphone	UC-59	12046
	Rion	Calibrator	NC-74	34536109
		Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 10. SLM 61672-3:2013

Procedures from IEC 61672-3:2013 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2013 Yes

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013

Date Received 23 March 2023

ANV Job No. UKAS23/03210

Date Calibrated 29 March 2023

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	Dated	Certificate No.	Laboratory
	27 April 2022	UCRT22/1571	0653

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.



CERTIFICATE OF CALIBRATION	Certificate Number UCRT23/1441
UKAS Accredited Calibration Laboratory No. 0653	Page 2 of 2 Pages

Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1
SLM instruction manual ref / issue	No. 56034 21-03 Source Rion
Date provided or internet download date	19 March 2021
	Case Corrections Wind Shield Corrections Mic Pressure to Free Field Corrections
Uncertainties provided	Yes Yes Yes
Total expanded uncertainties within the requirements of IEC 61672-1:2013	
YES	
Specified or equivalent Calibrator	Specified
Customer or Lab Calibrator	Lab Calibrator
Calibrator adaptor type if applicable	NC-74-002
Calibrator cal. date	23 March 2023
Calibrator cert. number	UCRT23/1384
Calibrator cal cert issued by Lab	0653
Calibrator SPL @ STP	94.04 dB Calibration reference sound pressure level
Calibrator frequency	1001.98 Hz Calibration check frequency
Reference level range	Single dB
Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15	
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.	

Environmental conditions during tests	Start	End	
Temperature	23.83	23.66	± 0.30 °C
Humidity	40.6	49.5	± 3.00 %RH
Ambient Pressure	99.93	99.83	± 0.03 kPa

Indication at the Calibration Check Frequency		94.2		94.0		± 0.05 kPa	
Initial indicated level	94.2	dB	Adjusted indicated level	94.0	dB		
Uncertainty of calibrator used for Indication at the Calibration Check Frequency ±					0.10		
Self Generated Noise							
Microphone installed -	Less Than	17.6	dB	A Weighting			
Microphone replaced with electrical input device -				UR = Under Range indicated			
Weighting	A			C		Z	
	11.3	dB	UR	15.5	dB	UR	21.2
					dB		dB

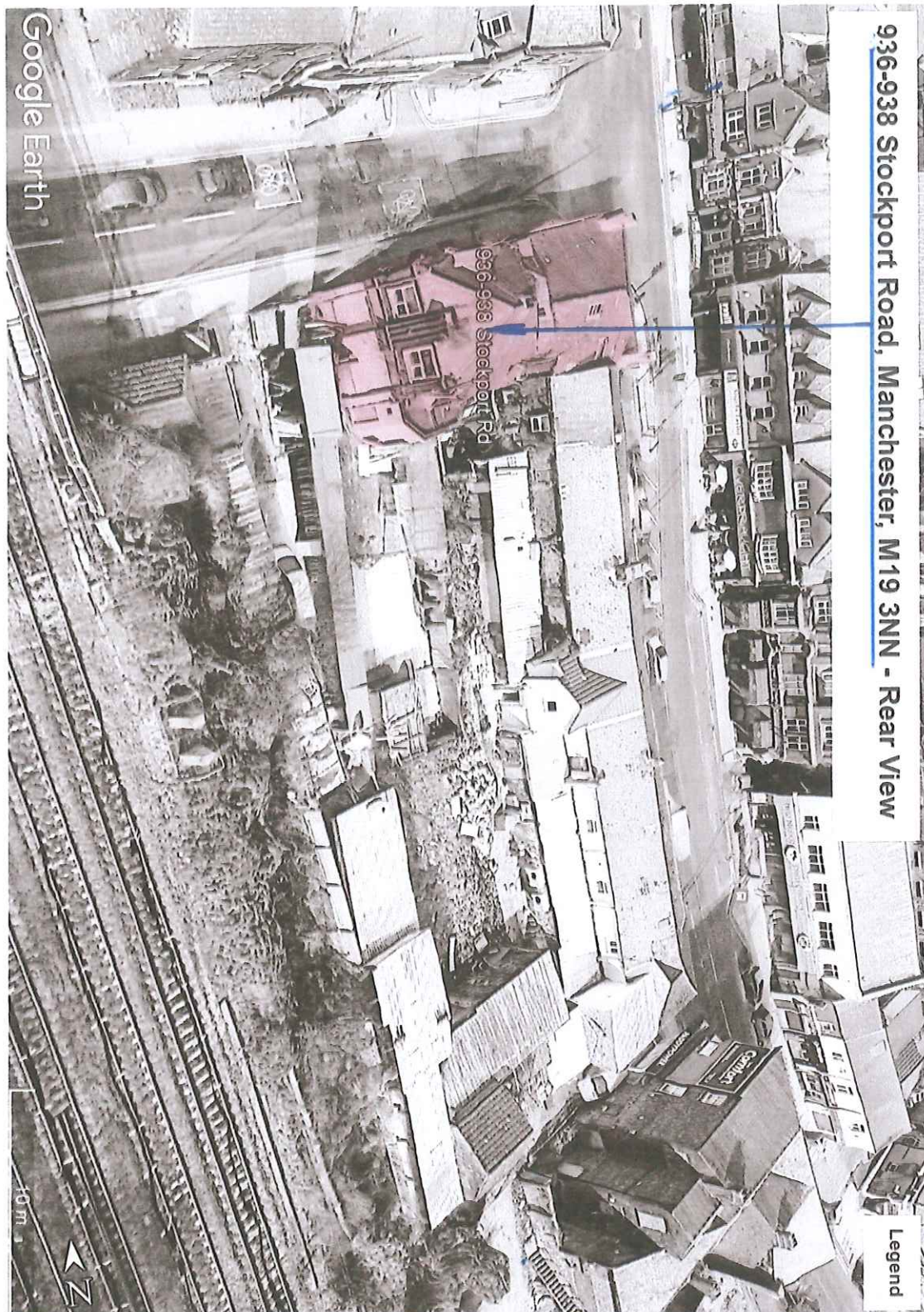
Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

..... END
Calibrated by: BB/KZ R 1



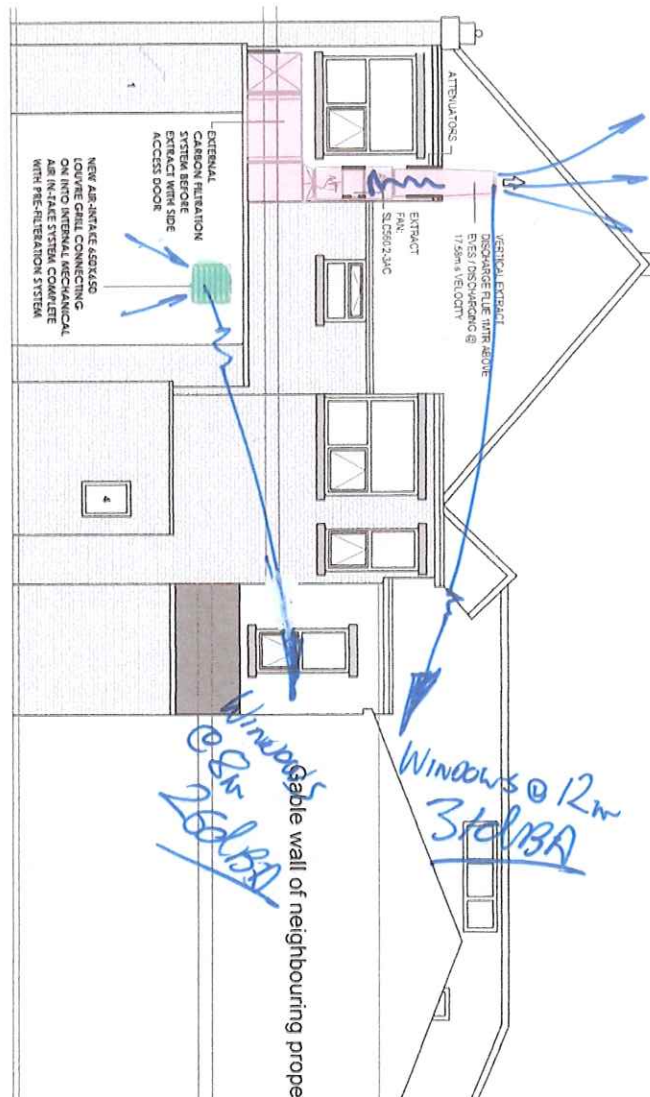
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SILONGA CPS 560-3D



powered

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MOBILE: 0779158062
EMAIL: info@poweredventilation.co.uk
WEB: www.poweredventilation.co.uk

Client: 93-938 STOCKPORT ROAD,
MANCHESTER,
M19 3NN,

Project: PROPOSED SIDE ELEVATION C
EXTERNAL EXTRACT DUCT & PLANT
EXTERNAL AIR-INTAKE LOUVER GRILL
LOCATIONS

Scale: 1/100

Drawing no:3

Job no: N/A

Council ref:

Officer:

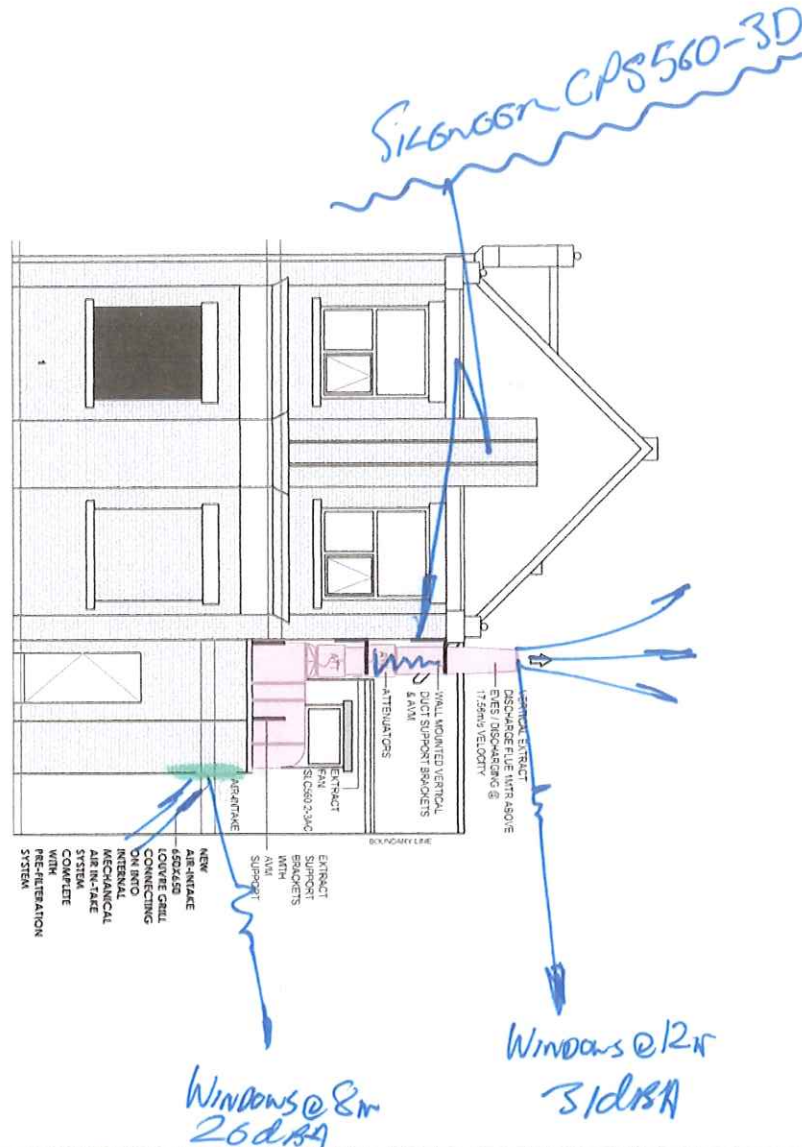
Notes:

Date: 19/05/23

Drawn: MUHAMMAD

Approved installers and contractors of:





powered ALEXANDER HOUSE, 60 TENBY STREET NORTH, BIRMINGHAM, B1 3EG MOBILE: 0779158062 EMAIL: info@poweredventilation.co.uk WEB: www.poweredventilation.co.uk	
Client: 936/28 STOCKPORT ROAD, MANCHESTER, M19 1NN.	
Project: PROPOSED REAR ELEVATION OF EXTERNAL EXTRACT DUCT & PLANT / EXTERNAL AIR-INTAKE LOUVER GRILL LOCATIONS	
Scale: 1/100	
Drawing no: 2	
Job no: N/A	
Council ref:	
Officer:	
Notes:	
Date: 19/05/23	
Drawn: MUHAMMAD	
Approved installers and contractors of:	

Ref: MDR/55327



	L/A	63	125	250	500	1k	2k	4k	8k
EXTRACTED - DATA SIL S60/ E-3AC SWL	91	86	92	93	90	88	86	83	
2m x 560 Ø DUCT	0	0	0	0	0	0	0	0	
HOOB DISCHARGE BR 0.125m	10	6	2	0	0	0	0	0	
SWL @ DISCHARGE	81	82	90	93	90	88	86	83	
SWL → SPL @ 12m	32	32	32	32	32	32	32	32	
SPHERICAL RADIATION SPL @ 12m	44	50	58	61	58	56	54	51	
'A' - WEIGHTING	-25	-16	-9	-3	0	+1	+1	-1	
	23	34	49	58	58	57	55	50	
		34		59		61		56	
				59				62	
						64 dBA			
SILICON CAR BOUNDED CPS 560-3D CIRCULAR	7	14	24	38	34	36	35	30	
SILICON CAR WITH PDS 560mm ^{1/2}	16	20	25	20	24	21	20	20	
x 710mm Ø / x 1680mm Length		21		26		26		23	
				27				28	
RESULTANT SPL _A @ 12m WITH SILICON CAR						31 dBA			

Ref: Mon/5327



Design Sheet ②

936-938 STOCKPORT ROAD, M19 3NN - KITEMAN SUPPLY INTAKES

	L/A	63	125	250	500	1k	2k	4k	8k
SUPPLY FROM BLTN SILCOFF									
2B-3DC SWL		84	81	88	85	88	86	83	79
SCOPE DUCT 1m		0	0	0	0	0	0	0	0
FILTER		3	3	3	3	3	3	3	3
LOWVOLT GSOX 650 0.425m ² SW		7	3	0	0	0	0	0	0
SWL @ INTAKE		74	75	85	82	85	83	80	76
SWL → SPL @ 8m		25	25	25	25	25	25	25	25
HEMISPHERICAL RADIATION									
SPL @ 8m		49	50	60	57	60	58	55	51
'A'-WEIGHTING		-26	-16	-9	-3	0	+1	+1	-1
		23	34	51	54	60	59	56	50
			34		56		63		57
				56			64		
						65dB			
SILENCER REQUIRED									
CPS 500-40 CIRCULAR		8	16	30	50	40	42	45	44
SILENCER WITH PDB SCC 1m/6		15	18	21	4	20	17	11	6
x 650mm/2 x 2000mm LONG			20		21		22		12
				24			21		
* RESONANT SPL @ 8m WITH SILENCER						26dB			
x * COMBINED SUPPLY INTAKE @ 8m					26dB				
EXTRACT DISCHARGE @ R.W.					31dB				
							32dB		

Ref: HNL/5537



Revolution SLC

Long Cased Axial Flow Fan



The Revolution SLC is a robust range of long cased axial fans, fitted with the renowned, Elta, adjustable pitch aerofoil section bladed impellers. An industry workhorse, this extensive range offers superb performance characteristics, combined with strength, durability and corrosion resistance for a longer life.

11 standard sizes from 315mm to 1000mm.

Air volume flow rates of up to 18.48 m³/s.

Static pressures of up to 800 Pa.

Suitable for operating temperatures up to +54°C.

Extensive stock range available.

The all metal fan casing provides a long lasting and robust construction. The units have been constructed from a single sheet of steel, with both motors and axial impellers mounted within the length of the unit casing.

All casing parts are heavy gauge mild steel sheet, roll formed and welded for added strength and durability, hot dip galvanised to BS EN ISO 1461:2009 after fabrication and drilled to BS ISO 6580:2005.

The fans are suitable for external mounting as standard.

ADJUSTABLE PITCH

Adjustable pitch aerofoil impellers are provided with blades made from high quality pressure die cast aluminium (LM6), natural finish.

Impellers are factory set at an angle to provide maximum performance.

The hubs are manufactured from die cast aluminium alloy (LM24). Assembled impellers are to be dynamically balanced to ISO 14694 Grade G6.3.

Motors are to be foot mounted totally enclosed metric type to IP55, with sealed for life bearings, standard industrial paint finish and Class F insulation to EN 60034-5, suitable for operating temperatures of up to +54°C.

Motors are to be wired via a weatherproofed cable to an IP55 protected terminal box mounted on the outside of the unit casing.

DESIGN & MANUFACTURING

Units are to be designed and manufactured with procedures as defined in BS EN ISO 9001:2008.

All SLC units are to be tested to ISO 5801:2007 (airside performance) and BS 848 Part 2:1985 (sound performance).



MORE INFORMATION

DESCRIPTION AND ELECTRICAL DATA	5
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APPROXIMATE WEIGHT	10
STANDARD DRAWINGS	11
STANDARD TO 12	12
400 VOLTAGE	13

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Northampton NN5 6HS
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Company Number 13751425

Sound Data

SINGLE Phase - 220V-240V / 50Hz

Date	Time								Total
	1	2	3	4	5	6	7	8	
16	75	72	72	70	67	63	58	54	
63	63	69	60	69	59	56	49	45	
83	81	80	84	78	77	74	67	64	
66	65	69	66	63	62	63	52	48	
85	83	82	86	80	79	78	69	66	
70	69	73	70	67	65	63	56	52	
81	78	85	82	85	93	80	76	63	
63	69	71	70	72	69	66	59	55	
76	71	74	71	70	69	67	60	55	
71	72	71	73	75	72	69	62	58	
77	74	77	74	73	72	70	63	58	
77	77	76	75	75	74	71	66	59	
77	77	76	75	75	74	71	66	59	
82	74	82	89	81	78	76	72	64	
77	77	76	77	74	70	67	57	54	
77	77	76	77	74	70	67	57	54	

THREE Phase - 380V-415V / 50Hz

	50	76	79	79	77	74	74	85	66		
	64	64	69	61	61	60	57	53	46		
	83	81	80	84	78	77	74	67	64		
	62	84	81	82	78	77	76	63	63		
	67	66	70	67	64	60	53	49			
	56	84	83	87	51	80	77	10	67		
	73	68	73	70	67	66	63	56	52		
	88	85	85	91	91	90	88	84	75		
	87	83	85	90	91	90	87	83	75		
	63	70	72	71	73	70	67	60	56		
	76	72	75	72	71	70	68	61	56		
	91	86	85	94	94	93	91	87	78		
2020-2021	94	81	88	85	88	85	83	79	71		
	71	72	74	73	75	72	69	62	58		
	77	74	77	74	73	72	70	63	58		
	77	74	77	74	73	72	70	63	58		
2020-2021	91	85	92	93	90	88	86	83	75		
	77	77	76	75	75	74	71	66	50		
	76	76	79	77	75	74	72	66	60		
	78	76	79	77	75	74	72	66	60		
	82	74	82	80	81	78	76	72	64		
	80	79	82	80	79	77	76	69	63		
	76	76	75	76	73	69	66	56	57		
	81	74	76	77	76	72	68	53	59		

Continued...

Category	Overall Performance									
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Category A	87	84	87	87	86	84	84	75	70	
Category B	85	85	88	88	87	85	85	76	71	
Category C	83	77	75	81	76	71	69	61	60	
Category D	82	79	50	81	76	71	70	59	61	
Category E	89	82	88	91	94	92	87	80	77	
Category F	89	82	88	91	94	92	87	80	77	
Category G	89	85	84	86	81	76	72	64	65	
Category H	92	84	88	83	87	85	78	69	70	
Category I	92	84	88	95	98	97	91	83	81	
Category J	94	92	94	93	90	95	86	81	79	
Category K	91	89	94	86	87	85	79	70	71	
Category L	91	86	88	83	87	79	74	69	70	
Category M	84	77	81	82	80	72	67	67	63	
Category N	94	87	90	97	100	99	93	85	83	
Category O	94	87	90	97	100	99	93	85	83	
Category P	77	74	77	74	73	72	70	63	58	
Category Q	88	91	87	83	88	86	77	71	71	
Category R	86	91	87	83	88	86	77	71	71	
Category S	84	80	81	86	84	78	69	65	60	

The tests and preparation of the sound data have been carried out in accordance with BS 849 Part 2:1985 at 50% peak pressure. The In-Duct Sound Power Level Spectra are in dB re 1 µW. The overall A-weighted sound pressure level is at a distance of 2m with spherical free-field propagation. It is expressed in dB re 20 µPa and is presented for comparative purposes only.

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Extechnology Ltd

Odour Control Equipment Specification

Maemes

**936-938 Stockport Road, Manchester,
M19 3NN**

Proposal For: Powered Ventilation Ltd

Site: 936-938 Stockport Road

Prepared By: Daniel Clark

Prepared For: Muhammad Ali

Document Date: 07/08/2023

Equipment Specification – 4.33m³s

Type of Unit:	RY7500B ESP
No of Units:	2
Size:	H 540 x W 1790 x D 620mm
Weight:	122 kg
Static Pressure:	50 Pa.

Type of Unit:	Ozone
No of Units:	3
Size:	H 150 x W 150 x D 480mm
Weight:	8 kg each
Static Pressure:	0 Pa.

For details please see spec sheets attached.

Describing the system

The Extechnology odour control application specified for **936-938 Stockport Road** has been designed in line with EMAQ+ guidance on the control of odour and noise from kitchen exhaust systems.

The specification contained in this document is compliant with EMAQ+ guidelines and all agreements have been put in place to ensure that the system is maintained in accordance with the manufactures specification and the EMAQ+ guidance.

The specified system will comprise of three layers of filtration and should be considered above and beyond compliant with point two detailed on page 11 of EMAQ+ guidance under the subheading "High level of odour control":

- Stage One: Baffle Filters
- Stage Two: Electrostatic Precipitator
- Stage Three: Ozone

Anticipated relative cost effectiveness based on a well-maintained system details the level of odour abatement expected to be achieved relative to the equipment installed. Cross referenced against this table the specification outlined in this document would result in a High level of odour abatement being achieved at **936-938 Stockport Road**.

Electrostatic Filtration

Contaminated air is drawn by the fan through a washable metal mesh pre-filter which traps large particles. The remaining particles, some as small as 0.01 microns, pass through a strong electrical field (ionizing section) where the particulates receive an electrical charge.

The charged particles then pass onto the collector plates section made up of equally spaced parallel plates. Each alternate plate is charged with the same polarity as the particles, which repel, while the interleaving plates are grounded, which attract and collect the contaminants.

The contaminants are held on these plates until they are washed off.

Ozone Filtration

How does ozone work?

The third oxygen atom of ozone makes it extremely reactive. This atom readily attaches itself to other odour molecules. When contaminants such as odours, or bacteria mix with ozone, their chemical structure is changed to less odorous compounds. As more ozone attacks the remaining compounds, the odour is eventually destroyed. This process is called oxidation.

Ozone essentially reverts back to oxygen after it is used. This makes it a very environmentally friendly oxidant.

How is ozone produced?

Ultra-violet (UV) light creates ozone when a wavelength at 254 nm (nanometers) hits an oxygen atom. Both processes split oxygen molecules into single oxygen atoms (O). These atoms combine with another oxygen molecule (O₂) to form ozone (O₃).



RY 7500B

Electrostatic Air Cleaner (Without Blower)



Industrial grade Electrostatic Air Cleaners for collection of dry and wet particulates like dust, oil mist, cooking fumes and various pollutants. Typical application include commercial kitchen exhausts, Air Handling Units (AHUs), factories, workshops, CNC machine shops and many other.

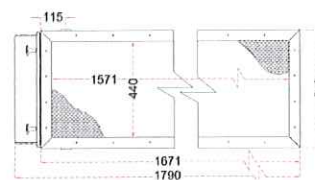


SPECIFICATIONS

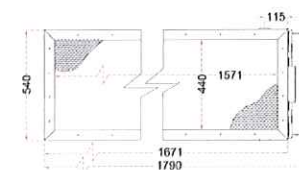
Dimensions/Weight	H: 540 x W: 1790 x L: 620mm / 122Kg
Cabinet	Galvanized Steel, 1.4mm / 16 Gauge
Finishing	Powder Coated, Dark Blue
Air Volume (Rated-Max)#	CFM: 4500-6100; CMH: 7500-10,500; L/s: 2100-2900
Static Pressure	50 pa / 0.2"
Voltage & Power	230 VAC +/-10%, 50/60Hz, 105Watts
Ionising Voltages	High Voltage: 12KVdc, Low Voltage: 6KVdc
Air Flow Direction	Default : Right to Left; Reversible : Left to Right
Power Supply	High Frequency solid state and self regulating design
Features	*Short circuit, arc protection and auto restore power supply *BMS (Building Management System) terminals provided *Auto power cut-off when door is opened *Indicator LEDs for normal or wash indicator *Set of Terminals for remote LED normal or wash indicator
Particle size	From 0.01 microns - 10 microns
Efficiency	DOP Test, up to 95% single pass, up to 99% double pass, calculated. ASHRAE 52.2-2012, up to 96% single pass, up to 99% double pass, calculated. NIOSH 5026 OIL MIST FIELD TEST : UP TO 96%
MERV Ratings	Meets MERV 15 at velocity of 2.5m/s to 3.8m/s
Pre-Filter	Aluminum wire mesh, Washable x 3
Electrostatic Cell	H: 472mm, W: 550mm, L: 340mm
No of Cells / Weight	3/16.5Kg
No Of Plates per Cell	59
Total Collecting Area	18,21 Sq meters
Post Filter (Optional)	Aluminum Wire Mesh, Washable x 3
Installation	Ceiling Suspended; Wall or Frame Mounted, Multiple Units Stacked



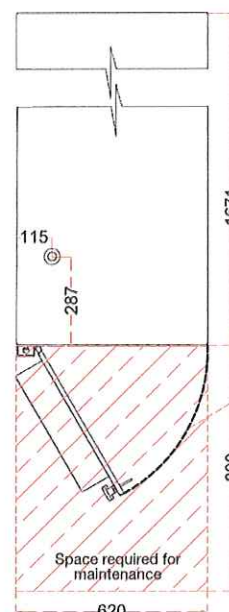
Front View



Air Intake View

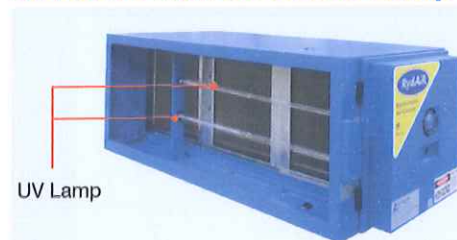


Air Discharge View



Top View

RY7500B with UV Ozone Lamp



RY7500B-UV03

ODOUR CONTROL OPTION:

- UV ozone Lamp fitted after electrostatic cell
- Lamp Wattage : 180 Watts (90W x 2 Lamps)
- Ozone output : 16 Grams/Hour
- Lamp Life : 13,000 Hours
- Lamp Operation Blue LEDs on Unit's Panel
- All accessories are contained in RY Unit

CONTROLLED OZONE UNITS



480mm Length x 150mm Depth x 150mm Height

Controlled Ozone products reduce cooking odours.

They can be controlled either by the built-in air sensor pump or by interfacing with remote monitoring sensors at the point of discharge and/or in the kitchen. Should either level exceed the safety guideline levels, the unit dwells for ten minutes, and restarts when the levels are back to normal.

The Ozone units have been specifically designed for use in commercial kitchens. The system injects ozone into the kitchen extraction system where it reacts with the organic particulates that cause odours. These particulates are oxidised by a chemical reaction resulting in the production of carbon dioxide and water vapour. The ozone itself is consumed during the process and is converted back to oxygen.

The Co200 Professional Range is a energy efficient odour control unit. The unit via its integrated smart control system is able to react to the air volume being drawn out of the kitchen through the duct work and thus only produce the level of ozone.

BENEFITS OF THE OZONE FILTER



- Energy efficient
- Smart controlled - the unit works and reacts to system air pressure and ozone output
- Compact, lightweight and quiet operation
- Quick, easy, low-cost installation
- Low capital and running costs — up to 50% less than traditional UVC systems
- Injection into duct work - adding negligible back pressure to the system so requiring less energy to push air through the air handling system
- The Co200 professional maintains efficiency as they remain outside of the air-stream, they also require less maintenance and require less cleaning
- Can be controlled by a remote sensor
- Compliant With DEFRA 2005 DW172 BUILDING REGS PART F, G, L.

TECHNICAL INFORMATION

Model reference: Corona Ozone

Measuring : 480 x 150 x 150 mm.

Duct work connection: 100mm circular.

Volume flow rate in ductwork: 1.9 cm³/s

per unit, subject to cooking odours.

Air residence time inside chamber: >0.5 seconds.

Pressure drop: N/A.

Weight of unit: 6Kg approx.

Electrical requirements: 220V/1ph/50/60Hz

Optional Ozone discharge sensor control to ensure that emissions stay within guidelines.



3 Controlled Ozone is compliant with DEFRA 2005 DW172 BUILDING REGS PART F, G, L.

Packaging contains: the CO214M unit, 3 pin plug, length of air hose, 2 adaptors with fixing self tapping screws, plus the black sensor lock.

Integral Pressure Flow Switch installed to ensure that ozone is only produced whilst the extraction fans are operating.

INSTALLATION INSTRUCTIONS

It is recommended the units are located with an injection point located closest to the source of odours, (i.e. Canopy plenum or nearest accessible point on ductwork).

The unit must always be installed before the fan, outside of the airflow with the ozone being drawn from the unit.

The Black Sensor Lock must be fitted to bypass the PLC when remote sensors are not in use.



The provided air hose should be pushed into the hose connector on the end of the unit and using the adaptor provided. The other end should be fitted into the extraction duct.

A template sheet is provided to assist with the location of fixing points.

The unit must be inspected, serviced and commissioned twice a year by a qualified engineer.



Controlled Ozone is a proprietary range of products developed by . We pride ourselves in delivering cutting edge sustainability technologies for the commercial kitchen. Please check out our other initiatives at: . We are always happy to hear your views and welcome any observations which may assist us improve our customer service.

VERTICAL DISCHARGE FLUE EFFLUX VELOCITY & PLANT DETAILS:

The Extract duct work will connect off the top entry filter bank spigot of the 4.5mtr canopy extract hood which will go horizontal against ceiling internal of the building before connecting onto the main header of the extract duct with a volume control damper to balance off extract in order to allow correct velocity of each hood connecting onto main header. The connections for hoods (B) and (C) will follow the same principle as connection (A) with VCD's (volume control dampers) on to the internal Odour Abatement system which will comprise of 2 No. RY7500B ESP units, before this unit's Canopy hoods (A),(B) & (C) spigots will branch onto there respective 3 No. Ozone injectors units (for further details of units see details provided by EXTECHNOLOGY EURPORE) before exiting onto the external vertical discharge riser rear of the property upon the flat roof before going onto the vertical discharge riser 1mtr above eaves. Before the vertical riser the extract duct will connect onto the external plant system which will be the extractor fans united on to attenuators and AVMS fixed and isolated which will help nullify any further transmitting noise (please see noise assessment for attenuator details and calculations provided by Acoustic Consultant), the extractor fans will be speed controlled via auto-transformer / inverter regulator which will help prevent harmonic sounds which cause fan to make when operated by electronic controllers. The vertical discharge flue will be 1metre above eaves of main building discharging at high level via a high Velocity low-loss efficiency cowl.

Duct Dimensions for Main Extract header for Extract hoods (A) / (B) & (C) and Discharge flue efflux velocity :

The main extract duct header will be required to be approximately 700*700 or equivalent up to the external plant system.

$$4.33 / 0.49 = 8.84\text{m/second}$$

The efflux velocity is **17.58m/second** and the duct work will be free from grease disperse all odours to high level via 560dia or equivalent High Velocity low-loss Discharge Cowl. The vertical discharge flue will be set 1mtr above eaves.

NOISE / VIBRATION CONTROL / IMPACT NOISE ASSESSMENT / ACOUSTIC ASSESMENT & DESIGN:

The details with regards to the Noise Assessment has been provided and produces by **RANDTECH CONSULTANTS LTD** in accordance to the BS4142-2014 as per instruction. Anti-vibration and dura-dyne connection shall be fixed and isolated to all plant and machinery.

All plant and Machinery for the Ventilation extraction system and fresh-air inlet fans will be located internal of building with Anti-Vibration mounts and Dura-Dyne and attenuators hard fixed and isolated as per Design shown on the report this will help reduce outbreak noise from plant and any transmitting vibration as its located internally again Anti-Vibration mounts will also be fixed to the external vertical riser , secondly the fans will be regulated via Auto-transformer/inverter control which nullify any harmonic sounds which are found when using electronic regulators.

VERTICAL DISCHARGE FLUE EFFLUX VELOCITY & PLANT DETAILS:

The Extract duct work will connect off the top entry filter bank spigot of the 4.5mtr canopy extract hood which will go horizontal against ceiling internal of the building before connecting onto the main header of the extract duct with a volume control damper to balance off extract in order to allow correct velocity of each hood connecting onto main header. The connections for hoods (B) and (C) will follow the same principle as connection (A) with VCD's (volume control dampers) on to the internal Odour Abatement system which will comprise of 2 No. RY7500B ESP units, before this unit's Canopy hoods (A),(B) & (C) spigots will branch onto there respective 3 No. Ozone injectors units (for further details of units see details provided by EXTECHNOLOGY EURPORE) before exiting onto the external vertical discharge riser rear of the property upon the flat roof before going onto the vertical discharge riser 1mtr above eaves. Before the vertical riser the extract duct will connect onto the external plant system which will be the extractor fans united on to attenuators and AVMS fixed and isolated which will help nullify any further transmitting noise (please see noise assessment for attenuator details and calculations provided by Acoustic Consultant), the extractor fans will be speed controlled via auto-transformer / inverter regulator which will help prevent harmonic sounds which cause fan to make when operated by electronic controllers. The vertical discharge flue will be 1mtr above eaves of main building discharging at high level via a high Velocity low-loss efficiency cowl.

Duct Dimensions for Main Extract header for Extract hoods (A) / (B) & (C) and Discharge flue efflux velocity :

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ODOUR CONTROL: OPERATION & MAINTANCE (EMAQ+CONTROLL OF ODOUR AND NOISE FROM COMMERCIAL KITCHEN EXHAUST SYSTEM)

Appendix 3: Risk Assessment for Odour:

Dispersion = 10 (Discharging 1mtr above eaves at 10-15m/s)

Proximity of receptors: 10

Size of Kitchen = 3

Cooking type = 10 (Pub / High level of fried foods / fried chicken, burgers or fish & chips)

Total Score = 33

Ratings 20-35 High level odour control

Accordance to DEFRA/EMAQ "Odour arrestment plant performance:

High level odour control may include:

1. Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.4-0.8 seconds residence time).
2. Fine filtration or ESP followed by carbon filtration and by counteract ant/neutralising system to achieve the same level control as 1.
- 3. Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.** (note this is the required odour abatement system for this location - see details of system provided by EXTECHNOLOGY LTD)

The ESP / Ozone Injectors should be inspected for every 3-6 months for results in changing or service of the ESP Cells, again this will be done by Installation contractors. The service will give us a result in whether the change of the Cells or UV LAMPS should take place every 3 to 6 months to maintain its optimum efficiency however it will be also the clients duty to inform contractor of services due not to cause any fall back of issues of odour arising due to the fact of the contractors absence of notifying the client of service.

The canopy and the stainless steel baffle filters should be cleaned on a daily basis. The stainless steel baffle grease filters are of a 304 grade, the grease filters are to be cleaned on the regime and use of the kitchen, typically a grease filter is cleaned on a daily basis.

The inspection and service of the fan is required every 6 months which will have to be carried out by the Installation contractors. This again will be inspected by the installers.

We recommend that the canopy and the duct work should receive a full deep clean 6 months after installations and then every 6 months thereafter by our recommend cleaning company, to maintain the maximum efficiency of the extraction system.

The service of the system will be kept on a data base by the installers which will contact the user when inspection is due, the customer will have a inspection book which will be stamped after inspection and service by the Installation contractors.

**FURTHER DETAILS OF FILTERS WITH O & M (EMAQ) - MANUFACTURER
AIRCLEAN LTD)**

O & M INSTRUCTION

PRODUCT GROUP 1120 – DISPOSABLE SYNTHETIC PANELS (GRADE G3 TO EN779) (FRESH-AIR INLET FILTER)

Safety

It is recommended that industrial gloves, overalls, eye protection and nuisance dust masks are utilised when changing filters which have been subjected to natural air, as opposed to air drawn from processes, where full risk assessments should be performed prior to changing. For some filters, an assessment regarding manual handling will need to be made.

Changing of filters should be carried out by experienced or trained personnel, in accordance with safety requirements as defined by the "Control of Substances Hazardous to Health (COSHH) Regulations. ie. Someone who fully understands the design, operation and implications of the product and its use.

General

Withdraw and dispose of the dirty filter and replace with a clean panel.

Recommended discard resistance is 0.5" w.g. (125 Pa) in excess of clean resistance.

Disposal of Air Filters Including Personal Protective Equipment

- ☐ Filters and PPE have been damaged prior to use can be disposed of as normal industrial waste.
- ☐ Filters and PPE soiled with exterior air can be disposed of as normal industrial waste.
- ☐ Filters and PPE soiled by process air, bacterial, toxic and/or radioactive matter must be disposed of as Hazardous Waste in accordance with local regulations of the site and Environmental Health. Legislation prohibits removal of this waste from the site location.

**QUANTITY 3 OFF 595*595*22 (FRESH-AIR INLET PRE-FILTER PANELS
INSTALLED BEFORE AIR-INLET FAN)**

Applications The disposable Synthetic Panel Air Filter is a medium efficiency filter suitable for ventilation and air conditioning systems, providing an improved performance over the fibre glass panel air filter. The construction of the synthetic panel air filter makes it less liable to shed fibres than a fibre glass panel filter, and therefore suitable for installations such as the food industry and hospitals.

DISPOSABLE SYNTHETIC MEDIA FILTERS

Grade G3 to EN779:2012

Applications

The disposable Synthetic Panel Air Filter is a medium efficiency filter suitable for ventilation and air conditioning systems, providing an improved performance over the fibre glass panel air filter.

The construction of the synthetic panel air filter makes it less liable to shed fibres than a fibre glass panel filter, and therefore suitable for installations such as the food industry and hospitals.



Description

Synthetic Panel Air Filters consist of a dry, graduated, high loft and fully flame retardant synthetic fibre filter media, housed within either a standard rigid cardboard filter frame, or an Airclean Moisture Resistant (AMR) cardboard frame. Air Filter stiffening bars can be provided if required. Panel Filter Stiffening bars can be provided if required.

Our method of manufacture for panel air filters utilise modern hot-melt adhesive techniques, which produce an extremely rigid and robust product.

Technical

The media is Flame Retardant to DIN53438
Max Operating Temp 100 Deg C
Dust Holding Capacity 844 g/m²
Recommended Face Velocity 2.25m/s
Nominal to Actual Size: less 6mm on H & W, 3mm on Depth

STANDARD SYNTHETIC PANEL FILTER SIZES

Size		Flow Rate	Part Numbers	
OT Inches	Actual mm	m ³ /s	1" (22mm)	2"(47mm)
10 x 10	242 x 242	0.13	1120101	1120201
12 x 12	289 x 289	0.19	1120102	1120202
15 x 15	369 x 369	0.31	1120103	1120203
18 x 18	445 x 445	0.44	1120104	1120204
20 x 10	495 x 242	0.27	1120106	1120206
20 x 16	495 x 394	0.43	1120108	1120208
20 x 20	495 x 495	0.55	1120110	1120210
25 x 16	620 x 394	0.55	1120111	1120211
25 x 20	620 x 495	0.69	1120112	1120212
24 x 12	594 x 289	0.39	1120113	1120213
24 x 20	594 x 495	0.66	1120114	1120214
24 x 24	594 x 594	0.79	1120115	1120215

Notes

- * Actual sized filters will be manufactured as ordered +/- 3mm
- * Clean Pressure Drops 1"- 66Pa, 2"- 75Pa based on a Face Velocity of 2.25 m/s
- * Max Size: 625Hx900W

Grease Filters

by Express-air

Aluminium Frame Galvanised Mesh Grease Filters

Order Ref	Size Inches	Size mm			Capacity
	W x H x D	W	H	D	m ³ /s *
EAGF12121	12 x 12 x 1	292	292	20	0,19
EAGF12122	12 x 12 x 2	292	292	45	0,19
EAGF16161	16 x 16 x 1	394	394	20	0,33
EAGF16162	16 x 16 x 2	394	394	45	0,33
EAGF18181	18 x 18 x 1	445	445	20	0,42
EAGF18182	18 x 18 x 2	445	445	45	0,42
EAGF20101	20 x 10 x 1	495	241	20	0,26
EAGF20102	20 x 10 x 2	495	241	45	0,26
EAGF20161	20 x 16 x 1	495	394	20	0,41
EAGF20162	20 x 16 x 2	495	394	45	0,41
EAGF20201	20 x 20 x 1	495	495	20	0,52
EAGF20202	20 x 20 x 2	495	495	45	0,52
EAGF24241	24 x 24 x 1	597	597	20	0,75
EAGF24242	24 x 24 x 2	597	597	45	0,75
EAGF25202	25 x 20 x 2	662	495	45	0,65

*capacity based on Initial clean resistance of 30Pa @ 2.5m/s velocity



Aluminium Baffle Filters

Order Ref	Size Inches	Size mm			Capacity m ³ /s against Resistance Pa *			
	W x H x D	W	H	D	50pa	100pa	150pa	200pa
EABFA16162	16 x 16 x 2	394	394	45	0,12	0,16	0,20	0,24
EABFA18182	18 x 18 x 2	445	445	45	0,20	0,28	0,35	0,39
EABFA20102	20 x 10 x 2	495	241	45	0,12	0,16	0,20	0,24
EABFA20162	20 x 16 x 2	495	394	45	0,20	0,28	0,35	0,39
EABFA20202	20 x 20 x 2	495	495	45	0,26	0,38	0,46	0,51
EABFA24242	24 x 24 x 2	597	597	45	0,35	0,50	0,66	0,71



Stainless Steel Baffle Filters

Order Ref	Size Inches	Size mm			Capacity m ³ /s against Resistance Pa *			
	W x H x D	W	H	D	50pa	100pa	150pa	200pa
EABFS16162	16 x 16 x 2	394	394	45	0,12	0,16	0,20	0,24
EABFS18182	18 x 18 x 2	445	445	45	0,20	0,28	0,35	0,39
EABFS20102	20 x 10 x 2	495	241	45	0,12	0,16	0,20	0,24
EABFS20162	20 x 16 x 2	495	394	45	0,20	0,28	0,35	0,39
EABFS20202	20 x 20 x 2	495	495	45	0,26	0,38	0,46	0,51
EABFS24242	24 x 24 x 2	597	597	45	0,35	0,50	0,66	0,71

* The resistance quoted above is both the initial and operating resistance due to the self draining capacity of the filter.

Client: 936-938 STOCKPORT ROAD,
MANCHESTER,
M19 3NN,

Project: PROPOSED PLAN ELEVATION OF
INTERNAL EXTRACT HOODS &
INTERNAL ESP & OZONE ODOUR
ABATEMENT & AIR-INTAKE PLANT

Scale: 1/100

Drawing no:R1

Job no: N/A

Council ref:

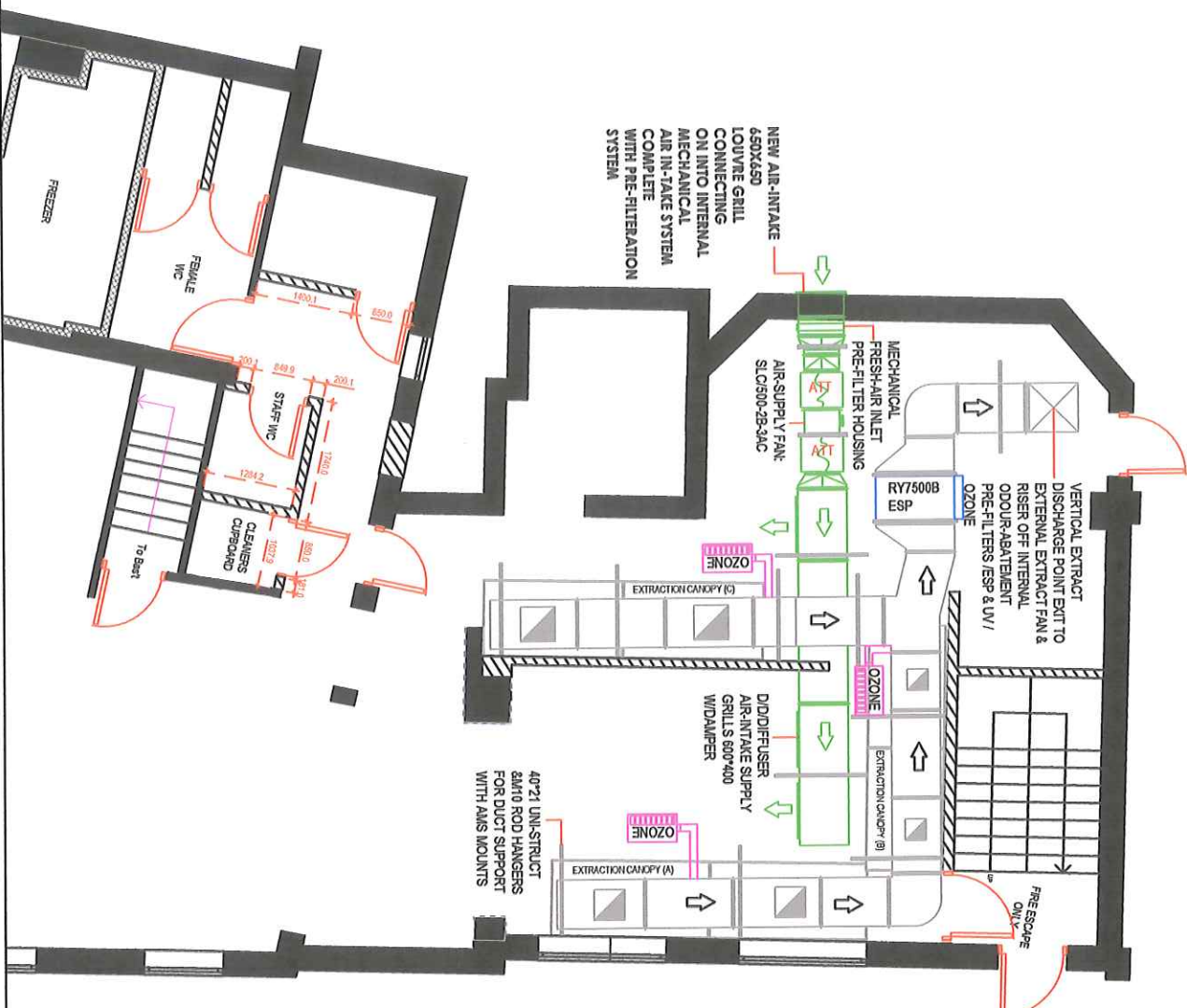
Officer:

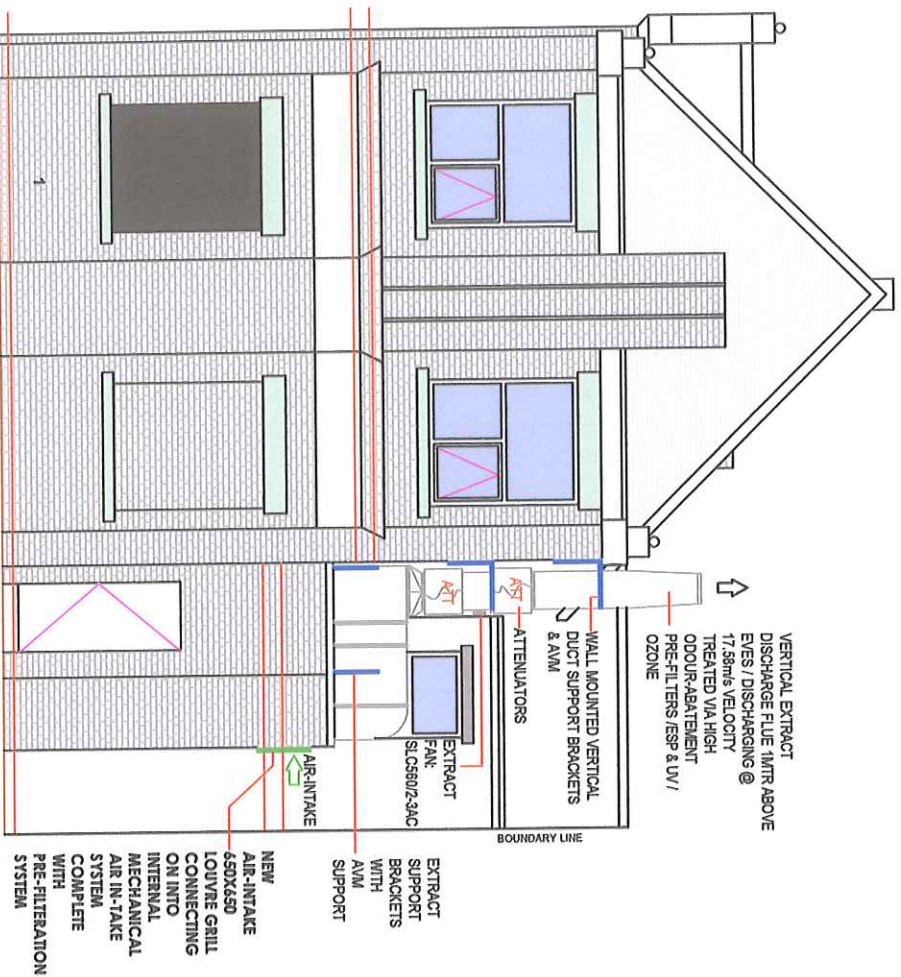
Notes:
designed in line with EMAQ+ guidance on the
control of odour and noise from kitchen
exhaust systems.

Date: 08/08/23

Drawn: MUHAMMAD

Approved installers and contractors of:





ALEXANDER HOUSE,
60 TENBY STREET NORTH,
BIRMINGHAM, B1 3EG

MOBILE: 0779158062

EMAIL: info@poweredventilation.co.uk

WEB: www.poweredventilation.co.uk

Client: 936-938 STOCKPORT ROAD,
MANCHESTER,
M19 3NN,

Project: PROPOSED REAR ELEVATION OF
EXTERNAL EXTRACT DUCT & VERTICAL
RISER WITH EXTRACT FAN SILENCERS
& AIR-INTAKE LOUVRE GRILL LOCATION

Scale: 1/100

Drawing no: R2

Job no: N/A

Council ref:

Officer:

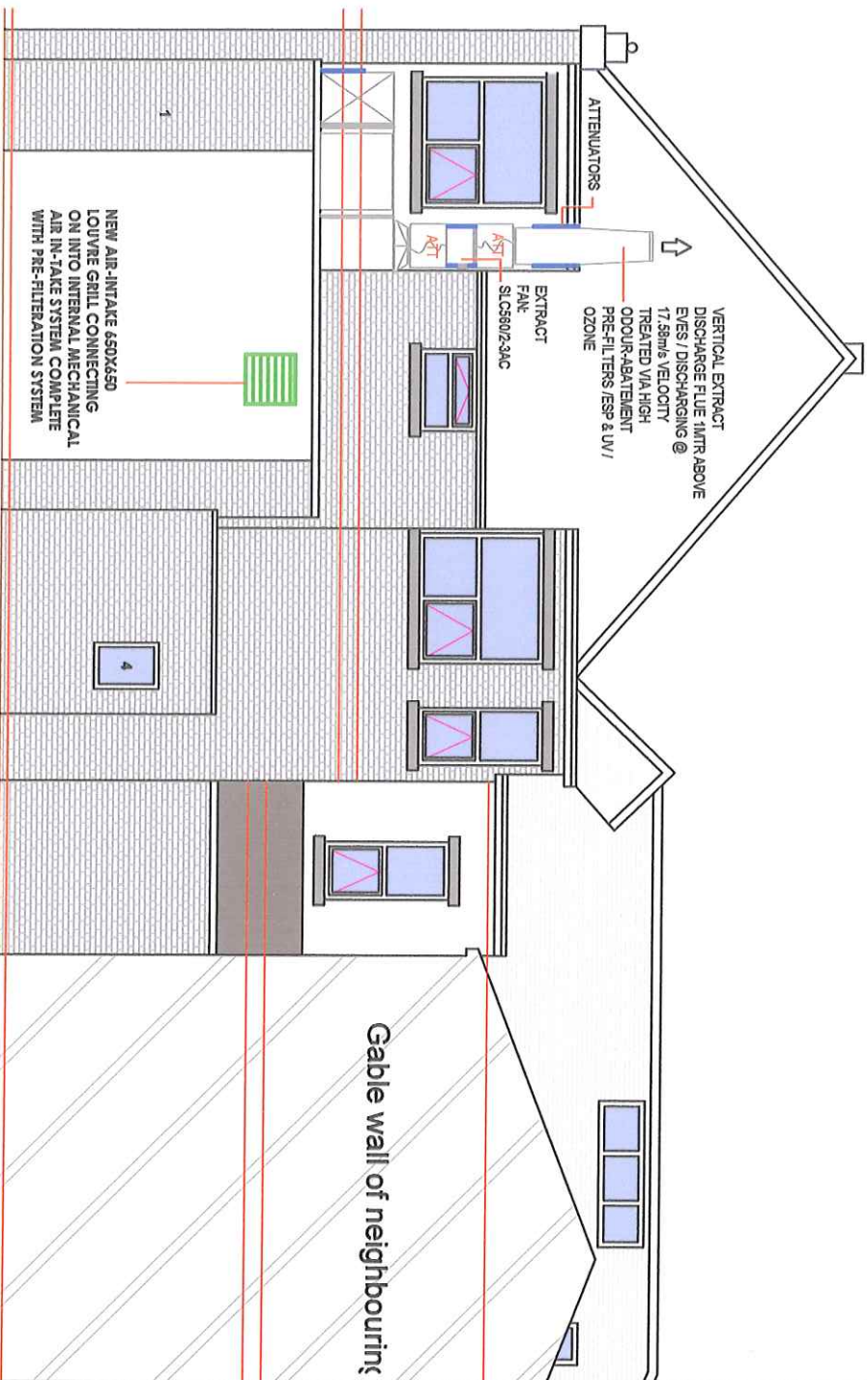
Notes:
designed in line with EMAQ+ guidance on the
control of odour and noise from kitchen
exhaust systems.

Date: 08/08/23

Drawn: MUHAMMAD

Approved installers and contractors of:





ALEXANDER HOUSE,
60 TENBY STREET NORTH,
BIRMINGHAM, B1 3EG
MOBILE: 0779158062

EMAIL: info@poweredventilation.co.uk
WEB: www.poweredventilation.co.uk

Client: 936-938 STOCKPORT ROAD,
MANCHESTER,
M19 3NN,

Project: PROPOSED SIDE ELEVATION OF
EXTERNAL EXTRACT DUCT & VERTICAL
RISER WITH EXTRACT FAN SILENCERS
& AIR-INTAKE LOUVER GRILL LOCATION

Scale: 1/100

Drawing no:R3

Job no:N/A

Council ref:

Officer:

Notes:
designed in line with EMAQ+ guidance on the
control of odour and noise from kitchen
exhaust systems.

Date: 08/08/23

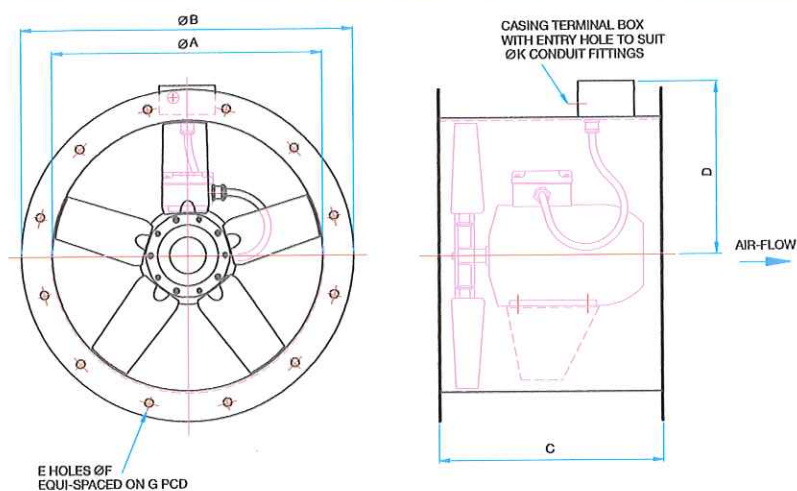
Drawn: MUHAMMAD

Approved installers and contractors of:



Revolution SLC

Dimensional Data



Product Code	Fan Dia. A	B	C	D	E	F	G	K	Weight kg	
									1Ph	3Ph
SLC315	315	375	300	225	8	10	355	20	17	17
SLC355	355	425	375	245	8	10	395	20	23	29
SLC400	400	475	400	265	8	12	450	20	34	36
SLC450	450	530	375	290	8	12	500	20	34	33
SLC450/2-3B	450	530	450	290	8	12	500	25	-	58
SLC500	500	585	400	315	12	12	560	20	37	37
SLC500/2-3	500	585	450	315	12	12	560	25	-	72
SLC560	560	645	400	345	12	12	620	20	40	44
SLC560/2-3	560	645	570	345	12	12	620	25	-	96
SLC630	630	715	400	380	12	12	690	20	50	47
SLC630/4-3B	630	715	450	380	12	12	690	20	-	58
SLC710	710	795	450	420	16	12	770	20	-	70
SLC710/4-3B	710	795	450	420	16	12	770	25	-	77
SLC800	800	885	450	465	16	12	860	25	-	79
SLC800/4-3B	800	885	570	465	16	12	860	25	-	101
SLC900/4-3A	900	1000	450	465	16	15	970	25	-	107
SLC900/4-3B	900	1000	450	515	16	15	970	25	-	107
SLC900/6-3A	900	1000	570	515	16	15	970	25	-	127
SLC900/6-3B	900	1000	570	515	16	15	970	25	-	135
SLC900/8-3	900	1000	710	515	16	15	970	32	-	203
SLC1000	1000	1110	590	565	16	15	1070	25	-	159
SLC1000/4-3B	1000	1110	790	565	16	15	1070	32	-	239
SLC1000/4-3C	1000	1110	790	565	16	15	1070	32	-	263

All dimensions are expressed in mm.

Revolution SLC

Performance and Electrical Data

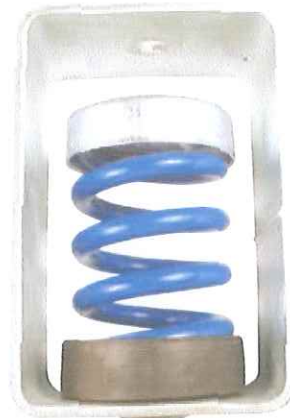
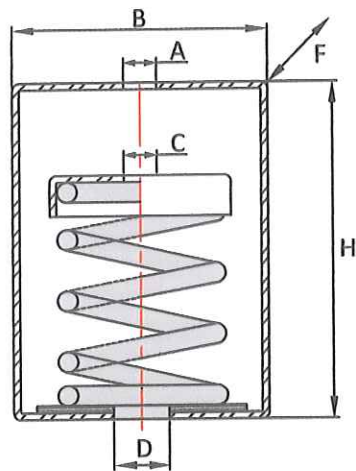
THREE Phase - 380V-415V / 50Hz

Product Code	Speed r/min	Airflow	Airflow m³/s @ Static Pressure Pa.												Motor Electrical Data			A.V. Mounts
			0	50	100	150	200	250	300	400	500	600	700	800	FLC Amps	SC Amps	Output kW	
SLC315/2-3	2780	m³/s	0.95	0.93	0.91	0.88	0.84	0.82	0.78	0.66					1.4	8.54	0.55	S1G
SLC315/4-3	1365	m³/s	0.64	0.58	0.46										0.44	1.94	0.12	S1G
SLC355/2-3A	2800	m³/s	1.48	1.45	1.42	1.38	1.34	1.31	1.26	1.17	1.03				2.26	179	1.1	S1G
SLC355/2-3B	2840	m³/s	1.93	1.89	1.85	1.82	1.77	1.73	1.68	1.56	1.40				4.42	33.6	2.2	S1G
SLC355/4-3	1340	m³/s	0.85	0.77	0.66										0.62	3.22	0.18	S1G
SLC400/2-3	2840	m³/s	2.40	2.37	2.34	2.29	2.25	2.22	2.16	2.04	1.88	1.67			4.58	33.6	2.2	S2B
SLC400/4-3	1390	m³/s	1.42	1.31	1.16										1.03	5.82	0.37	S1G
SLC450/2-3A	2840	m³/s	2.89	2.82	2.78	2.72	2.66	2.60	2.53	2.39	2.22	2.00			4.42	33.6	2.2	S2B
SLC450/2-3B	2840	m³/s	3.83	3.79	3.74	3.69	3.63	3.57	3.50	3.31	3.10	2.84	2.50		7.49	61.7*	4.0	S2B
SLC450/4-3A	1390	m³/s	1.70	1.57	1.42	1.18									1.03	5.82	0.37	S2B
SLC450/4-3B	1365	m³/s	2.04	1.88	1.70	1.43									1.57	9.42	0.55	S2B
SLC500/2-3A	2850	m³/s	4.12	4.08	4.02	3.98	3.90	3.84	3.75	3.63	3.46	3.25	3.02	2.70	7.49	61.7*	4.0	S2
SLC500/2-3B	2935	m³/s	4.76	4.72	4.68	4.60	4.52	4.46	4.40	4.24	4.08	3.88	3.63	3.32	10.2	82.4*	5.5	S2
SLC500/4-3A	1390	m³/s	1.72	1.63	1.50	1.30	1.03	0.50							1.03	5.82	0.37	S2B
SLC500/4-3B	1370	m³/s	2.59	2.41	2.23	2.00	1.62								1.65	11.4	0.75	S2B
SLC500/4-3C	1380	m³/s	3.00	2.83	2.60	2.32									2.37	15.4	1.1	S2B
SLC560/2-3	2920	m³/s	6.70	6.63	6.51	6.37	6.30	6.18	6.05	5.80	5.53	5.25	4.88	4.50	13.7	92.5*	7.5	S2
SLC560/4-3A	1370	m³/s	2.80	2.67	2.52	2.29	1.98								1.56	11.4	0.75	S2B
SLC560/4-3B	1380	m³/s	3.50	3.31	3.13	2.88	2.60								2.37	15.4	1.1	S2B
SLC560/4-3C	1390	m³/s	4.06	3.85	3.60	3.32	2.94								3.30	20.4	1.5	S2B
SLC630/4-3A	1380	m³/s	3.69	3.52	3.32	3.08	2.76	2.32							2.37	15.4	15.4	S2
SLC630/4-3B	1400	m³/s	5.40	5.17	4.90	4.61	4.30	3.88							4.43	25.0	25.0	S2B
SLC630/6-3A	925	m³/s	2.78	2.40	1.90										1.11	5.77	0.37	S2B
SLC630/6-3B	920	m³/s	3.40	3.04	2.48										1.61	8.53	0.55	S2B
SLC710/4-3A	1405	m³/s	7.12	6.82	6.52	6.18	5.82	5.38	4.76						5.96	47.5	3.0	S2G
SLC710/4-3B	1420	m³/s	8.18	7.88	7.52	7.17	6.75	6.22							7.85	61.7*	4.0	S2G
SLC710/6-3A	920	m³/s	3.80	3.40	2.85										1.61	8.53	0.55	S2B
SLC710/6-3B	940	m³/s	5.56	5.06	4.28										3.8	22.3	1.5	S2
SLC800/4-3A	1420	m³/s	8.28	8.08	7.82	7.54	7.22	6.87	6.48	5.55					7.85	61.7*	4.0	S2G
SLC800/4-3B	1470	m³/s	9.60	9.38	9.08	8.82	8.50	8.16	7.80	6.90					10.4	84.8*	5.5	S2G
SLC800/6-3A	940	m³/s	6.92	6.38	5.62										3.8	22.3	1.5	S2
SLC800/6-3B	940	m³/s	7.48	7.02	6.50	5.69									5.26	30.5	2.2	S2G
SLC900/4-3A	1470	m³/s	12.10	11.78	11.47	11.16	10.78	10.39	10.00	9.00	7.70				13.9	114*	7.5	S2Y
SLC900/4-3B	1470	m³/s	14.70	14.39	14.04	13.76	13.38	13.02	12.60	11.65	10.38				20.9	126*	11	S3B
SLC900/6-3A	930	m³/s	8.18	7.72	7.20	6.55	5.66								5.26	30.5	2.2	S2G
SLC900/6-3B	950	m³/s	9.45	9.02	8.48	7.82	6.95								6.76	36.1	3.0	S2G
SLC900/8-3	710	m³/s	8.00	7.22	6.00										4.08	22.4	1.5	S2Y
SLC1000/4-3A	1470	m³/s	13.20	12.86	12.50	12.19	11.80	11.42	10.96	9.90	8.70				13.9	114*	7.5	S2Y
SLC1000/4-3B	1470	m³/s	16.00	15.62	15.35	15.02	14.62	14.18	13.71	12.71	11.50	9.77			20.9	126*	11	S3B
SLC1000/4-3C	1460	m³/s	18.22	17.92	17.48	17.15	16.84	16.35	15.35	14.12	12.38				28.2	170*	15	S3B
SLC1000/6-3A	930	m³/s	9.16	8.65	8.09	7.38	6.52	5.10							5.26	30.5	2.2	S2Y
SLC1000/6-3B	950	m³/s	10.70	10.15	9.57	8.88	8.00	6.88							6.76	36.1	3.0	S2Y
SLC1000/8-3	710	m³/s	8.60	7.90	6.92										4.08	22.4	1.5	S2Y

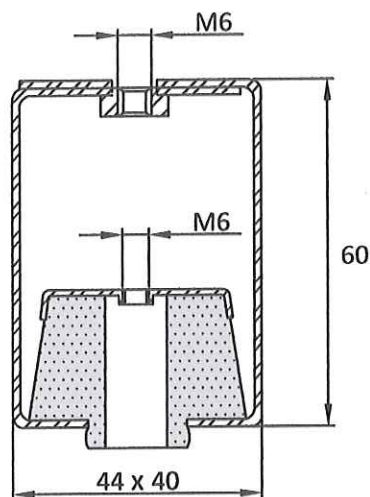
All starting currents are quoted as direct-on-line.

*Available for star-delta starting if required.

Hangers



Part No	B	F	H	A	D	C	Defl. mm	Max Kg
TM 25	75	55	100	12	30	11	24	25
TM 50	75	55	100	12	30	11	24	50
TM 75	75	55	100	12	30	11	24	75
TM 100	75	55	100	12	30	11	24	100
TM 150	120	75	155	16	16	14	35	150
TM 250	120	75	155	16	16	14	35	250
TM 350	120	75	155	16	16	14	35	350



Part No	Min kg	Max Kg
TVAR 40	8	25
TVAR 60	18	50
TVAR 75	25	75

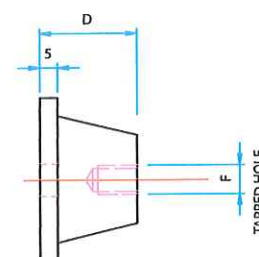
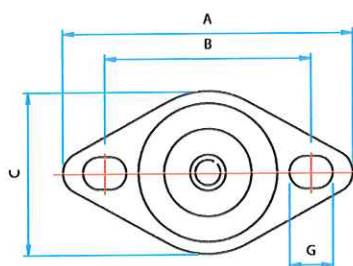
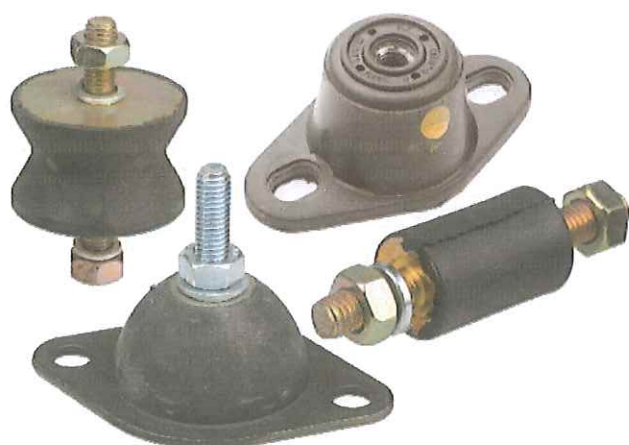
Max compression load in Kg deflection in mm.

This information is for guidance only. Customers are recommended to contact us for further technical information on products and applications.
We reserve the right to alter specifications or withdraw products without notice.

Revolution SLC - Long Cased Anti-Vibration Mounts



- Fit directly to mounting feet
- Rubber with steel insert
- Supplied as set of 4, complete with fixings



Product Code	A	B	C	D	E	F	G	Weight kg
062-S1G	64	50	43	5.5	20	M6	Ø7	0.040
062-S2	80	57	45	5	32	M8	12 x 9	0.100
062-S2B								0.100
062-S2Y								0.102
062-S3B	95	71	60	5	45	M10	14 x 9	0.104

Annex A:

Information Required To Support Planning Application For Commercial Kitchen

Information on Premises:

The number of meals which will be served per day will be around 30-100.

The methods and preparation of cooking will take place during business hours only and not before or after. The cooking style involves using fresh produce with light touches of fresh ground spices.

The types of meal that will be served is Grilled fast food which involves use of standard spices which are often used in other establishments, the strongest of the odour to be found in this type of cooking is the use of garlic and onion, the other spices are lightly used and have a low level of odour.

Plans and drawings:

Please find the scaled drawing submitted with this form in the ventilation design scheme.

Pre-filters:

Disposable Synthetic Panel Filters Manufacturers AirClean Ltd please see o&m instructions and technical supplied information see documents in ventilation report. To be used with the carbon filtrates system before the carbons which come after the stainless steel baffle filters which are installed on the canopy extract hood. Dimensions 595*595*45

Electrostatic precipitators:

PLEASE SEE DETAILS PROVIDED BY EXTECHNOLOGY EUROPE FOR ESP & OZONE ODOUR ABATEMENT DETAILS

Carbon filters (where proposed):

n/a

Cleaning and maintenance

The ESP / Ozone Injectors should be inspected for every 3-6 months for results in changing or service of the ESP Cells, again this will be done by Installation contractors. The service will give us a result in whether the change of the Cells or UV LAMPS should take place every 3 to 6 months to maintain its optimum efficiency however it will be also the clients duty to inform contractor of services due not to cause any fall back of issues of odour arising due to the fact of the contractors absence of notifying the client of service.

The canopy and the stainless steel baffle filters should be cleaned on a daily basis. The stainless steel baffle grease filters are of a 304 grade, the grease filters are to be cleaned on the regime and use of the kitchen, typically a grease filter is cleaned on a daily basis.

The inspection and service of the fan is required every 6 months which will have to be carried out by the Installation contractors. This again will be inspected by the installers. We recommend that the canopy and the duct work should receive a full deep clean 6 months after installations and then every 6 months thereafter by our recommend cleaning company, to maintain the maximum efficiency of the extraction system.

The ESP Cells/pre-filters and system will be kept on a data base by the installers which will contact the user when inspection is due, the customer will have a inspection book which will be stamped after inspection and service by the Installation contractors.

Odour counteract ant or neutralising system (where applied):N/A

n/a

Canopy hoods:

Dimensions hood (A) 4500 x 1100 x 400 / 500

Dimensions hood (B) 3500 x 1100 x 400 / 500

Dimensions hood (C) 4000 x 1100 x 400 / 500

The canopy's will be manufactured from stainless steel grade 430, with grease drain off taps on either sides of the extract hoods. The canopy hoods will be supplied with stainless steel baffle filters.

Face velocity hood (A) = 3.85m/s
Design volume = 1.54m³/sec (medium / heavy load)
6 off stainless steel baffle filters (cook face area)

Face velocity hood (B) = 2.31m/s
Design volume = 0.81m³/sec (medium load)
4 off stainless steel baffle filters (cook face area)

Face velocity hood (C) = 4.40m/s
Design volume = 1.98m³/sec (medium / heavy load)
8 off stainless steel baffle filters (cook face area)

Combined Design Volume: 4.33m³/sec

Total number of grease filters per hood (A) / (B) / (C) = 24 / Dimensions 495*495*45

Design Volume 4.33m³/s / 18 = 0.24m³/s

4.33m³/s / 0.24m³/s = 18.04

18 off stainless steel baffle filters (between hoods (A / 9) / (B / 7) / (C / 8)

Combined Design Volume for hoods (A) / (B) / (C) = 4.33m³/sec (Medium / Heavy 0.40m/s / Heavy Loading-0.51m/s

System operation:

The Extract duct work will connect off the top entry filter bank spigot of the 4.5mtr canopy extract hood which will go horizontal against ceiling internal of the building before connecting onto the main header of the extract duct with a volume control damper to balance off extract in order to allow correct velocity of each hood connecting onto main header. The connections for hoods (B) and (C) will follow the same principle as connection (A) with VCD's (volume control dampers) on to the internal Odour Abatement system which will comprise of 2 No. RY7500B ESP units, before this unit's Canopy hoods (A),(B) & (C) spigots will branch onto there respective 3 No. Ozone injectors units (for further details of units see details provided by EXTECHNOLOGY EURPORE) before exiting onto the external vertical discharge riser rear of the property upon the flat roof before going onto the vertical discharge riser 1mtr above eaves. Before the vertical riser the extract duct will connect onto the external plant system which will be the extractor fans united on to attenuators and AVMS fixed and isolated which will help nullify any further transmitting noise (please see noise assessment for attenuator details and calculations provided by Acoustic Consultant), the extractor fans will be speed controlled via auto-transformer / inverter regulator which will help prevent harmonic sounds which cause fan to make when operated by electronic controllers. The vertical discharge flue will be 1metre above eaves of main building discharging at high level via a high Velocity low-loss efficiency cowl.

Extract Duct details for Hood (B)

The Extract duct work will connect off the top entry filter bank spigot of the 3.5mtr canopy extract hood which will connect to the main header of duct with the VCD as mentioned above which canopy extract hood (A) is connecting onto

Extract Duct details for Hood (C)

The Extract duct work will connect off the top entry filter bank spigot of the 4.0mtr canopy extract hood which will connect to the main header of duct with the VCD which canopy extract hood (A) & (B) is connecting onto, to help balance the airflow and extract velocity for all three canopy extract hood and not to cause spillage volume control damper will be installed onto the spigots connecting before the main header of the extract duct for each hood as detailed in the extract layout specifics given above. The extract ductwork off all Canopy extract hoods will be internal against the ceiling.

Extract Duct Dimensions & extraction system flue details:

Extract Duct Dimensions for Hood (A)

The duct work size is approximately 430*430 or equivalent spigots connections up to main header of duct.

$$1.54 / 0.18 = 8.55\text{m/second}$$

Extract Duct Dimensions for Hood (B)

The duct work size is approximately 300*300 or equivalent spigots connections up to main header of duct.

$$0.81 / 0.09 = 9.00\text{m/second}$$

Extract Duct Dimensions for Hood (C)

The duct work size is approximately 490*490 or equivalent spigots connections up to main header of duct.

$$1.98 / 0.24 = 8.25\text{m/second}$$

Duct Dimensions for Main Extract header for Extract hoods (A) / (B) & (C) and Discharge flue efflux velocity :

The main extract duct header will be required to be approximately 700*700 or equivalent up to the external plant system.

$$4.33 / 0.49 = 8.84\text{m/second}$$

The efflux velocity is **17.58m/second** and the duct work will be free from grease disperse all odours to high level via 560dia or equivalent High Velocity low-loss Discharge Cowl. The vertical discharge flue will be set 1mtr above eaves.

Extractor Fans Specification

Extract Fan Specification for hood (A) / (B) & (C) :

Fan selected: SLC-560-2-3AC CASED AXIAL FAN, 2 pole, Three phase, speed control via Inverter drive. The Extract fans will be located internal of building plant area which will be united to an attenuator and will be fixed and isolated with anti-vibration mounts and Dura-dyne connections which will help any further transmitting noise and vibrations nullify.

The two fans each run at 2900rpms each with a maximum operating noise of 77dBA and will handle air flow rate 4.33m³/s @ 900-1000 pa.

Flue design:

The efflux velocity is 17.58m/second and the duct work will be free from grease disperse all odours to high level via 560dia or equivalent High Velocity low-loss Discharge Cowl. The vertical discharge flue will be set 1mtr above eaves.

Noise:

PLEASE SEE ACCOUSTIC DETAILS PROVIDED BY ACOUSTIC CONSULTANT

Maintenance:

The ESP / Ozone Injectors should be inspected for every 3-6 months for results in changing or service of the ESP Cells, again this will be done by Installation contractors. The service will give us a result in whether the change of the Cells or UV LAMPS should take place every 3 to 6 months to maintain its optimum efficiency however it will be also the clients duty to inform contractor of services due not to cause any fall back of issues of odour arising due to the fact of the contractors absence of notifying the client of service.

The canopy and the stainless steel baffle filters should be cleaned on a daily basis. The stainless steel baffle grease filters are of a 304 grade, the grease filters are to be cleaned on the regime and use of the kitchen, typically a grease filter is cleaned on a daily basis.

The inspection and service of the fan is required every 6 months which will have to be carried out by the Installation contractors. This again will be inspected by the installers. We recommend that the canopy and the duct work should receive a full deep clean 6 months after installations and then every 6 months thereafter by our recommend cleaning company, to maintain the maximum efficiency of the extraction system.

The ESP Cells/pre-filters and system will be kept on a data base by the installers which will contact the user when inspection is due, the customer will have a inspection book which will be stamped after inspection and service by the Installation contractors.

Additional notes for guidance: n/a

KITCHEN FRESH AIR-INLET DETAILS & CALCULATIONS :

Combined Design Volume: $4.33\text{m}^3/\text{s}$ (combined canopy hood design volumes)x 3600=
 $15,588\text{m}^3/\text{hr}$

Kitchen area volume $5.8\text{m} \times 6.1\text{m} \times 3.0\text{m} = 106.14\text{m}^3$ recommended air change rate for commercial kitchen is 30- 60 ach

The air change rate equates to $15,588\text{m}^3/\text{hr}$ divided by the Kitchen area volume 106.14m^3
This gives us an air change rate of 146.68ach. Minimum for commercial kitchen 30-60 ach,
this figure can be brought down using the speed regulator.

Supply Volume Design:

With such a high air change the design would call for the maximum recommended replacement of 85%

This would be $4.33\text{m}^3/\text{s}$ ($15,588\text{m}^3/\text{hr}$) x 85% requires $3.68\text{m}^3/\text{s}$ ($13,248\text{m}^3/\text{hr}$)

Pressure Lost in Air- Supply System

Allowing for 50 pa filter /(700*700 duct =7.51m/s velocity) 150 pa duct / 50 pa grille /
bends 100 = **350pa clean / 450 pa dirty**

Required duty and pressure: $3.68\text{m}^3/\text{s}$ @ 450 pa dirty

Air-Supply Fan and Grill Specification

Fan selected: SLC-500-2B-3AC CASED AXIAL FAN, 2 pole, Three phase, speed control via Inverter drive. The Air-supply fan will be located internal of building plant area which will be united to an attenuator and will be fixed and isolated with anti-vibration mounts and Dura-dyne connections which will help any further transmitting noise and vibrations nullify.

This fan runs at 2900rpms with a maximum operating noise of 71dBA and will handle air flow rate in excess of $3.68\text{m}^3/\text{sec}$ @ 600pa.