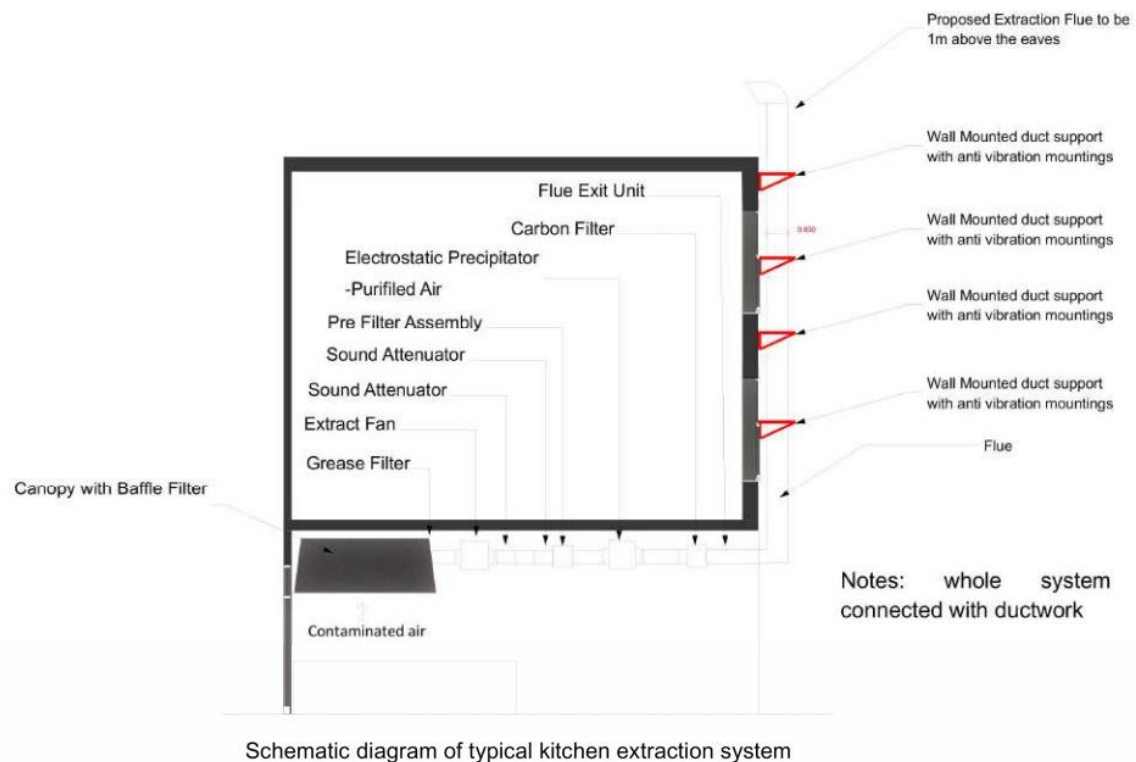


Proposed Extraction & Ventilation System

Re: Installation of kitchen extraction ventilation system on the side elevation for a Change of use Retail unit (Use Class A1) to Restaurant/ Takeaway (Use Class A3/A5).

Address: 219 Neath Road, Britton Ferry, SA11 2BJ

Noise and smells will be reduced by using the following extraction and ventilation system, which is designed to extract cooking smells away from any residential windows. The extract system will be designed so that noise is kept way below the existing background noise levels, as the fan, carbon filters, silencer and odour control mechanism will be located inside of the building.



Information:

The number of meals to be served per day will be dependent on the daily footfall, however it is anticipated to allow for 60 covers and seats. The restaurant will also offer a take-away service.

- The methods of preparation and cooking will be by grill, and fryer.
- The types of meal served is proposed to be fish and chips
- Proposed hours of operation are 9 am for preparation and open to public from 10 am to 10pm.

Detailed Design of Ventilation System

Cooker hood_Canapy

Manufacturer's name: CK Direct

Model: CKEH/2810E

Dimension (mm) : W:2800, H: 250/500, D: 1000

Modular canopy extraction system suitable for use with gas and electric cooking equipment

Technical Specifications:

Body: stainless steel, brush finish

Baffle Filters

Extraction rate: volume (m³/s) 3.9 (Maximum)

Fan motor rating (kW) 3 No° of filters 6

Canopy is designed in accordance with DW/172. Canopy contains 495 mm x 395 mm x 50 mm heavy duty washable stainless steel baffle type grease filters, with a 45mm rolled section channel frame with safety edge, and drain holes punched in the bottom edge.

Removable stainless steel grease collecting draws are provided within the apron of the filter housing. Stainless steel vapour-proof twin fluorescent recessed light units are provided or bulkhead type lighting can be supplied within the canopy if required.

Pre-filters (fresh air system)

Manufacturer's name: AAC Eurovent

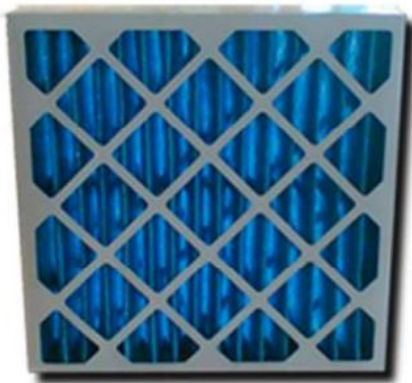
Filter name and product code: PLEATED PANEL AIR FILTER

Dimensions of the pre-filter: 47mm thick

Nature of the filter media: Glass Fibre

Media Manufacturer's recommendations on the frequency and type of maintenance of the pre-filter having regard to the conditions that it will be used within: 3 monthly maintenance

Details: Pleated panel filters are suitable for temperatures up to 1000C. Suitable for a wide range of industrial and commercial applications, these synthetic filters are made from a blend of cotton and polyester, bonded with a flame retardent binder and laminated to a galvanised mesh.



Cooker Hood Filter- Baffle Filters



Carbon Filter

Manufacturer's name: AAC Eurovent

Model: AAC Swiftpack_ Carbon Filter and Filters_

Volume rate (M3/s): 2.0

Dwell Time (0.1 sec): 600

Dwell Time (0.3 sec): 1375

Internal Unit Width (mm): 1170

Length (mm): 850

N° 2 in series to Achieve 3.9 (M3/s) + Dwell Time

Details: This compact and robust filter housing solution is available in both 316 stainless steel and galvanised mild steel and is suitable for a variety of volume flow rates.

The filter units have been fitted with hinged side access doors, complete with toggle fasteners, and are supplied with a set of PR_Carbon Filters.

Maintenance: Carbon Filter change every 12 months, Prefilter change every 4 weeks.

Technical details

Activated Carbon Discarb Cells can be used for the reduction of odour or for gas control. This System offer a compact and convenient method to housing bonded carbon panels ready for mounting in a range of filter housings.

Activated Carbon Discarbs offer a practical solution for controlling gases and odours in airflows from 0.1m3/s up to 10m3/s +.

Carbon Filters must be selected based on system duty airflows, and required contact times and contact times must be selected based on concentration and specific gases / odours that need to be removed.



Electrostatic precipitators

Manufacturer's name: Purified Air

Model: ESP 3000E

Details: ESP Range _ ESP 3000E which can handle up to 1.4m³ /sec of air flow

Dimensions of the ESP: W 900mm H 630 mm D 640 mm

Flow rate rating: up to 1.4m³/sec

Technical Specifications:

ESP 3000E

Electrical Supply 220/240V

Power Consumption 30 Watts

Max Air Volume up to 1.4m³/sec

Dimensions : W 900mm x H 630mm x D 640mm

Weight 85Kg

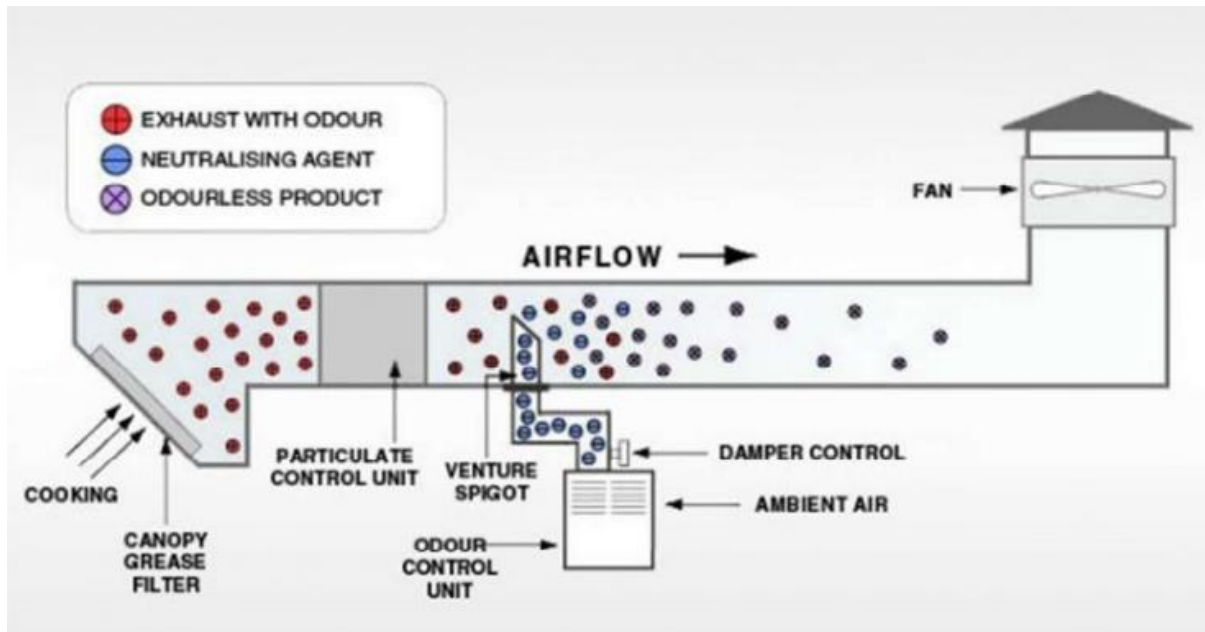
This Electrostatic precipitators have been specifically designed for kitchen extract systems; they have integral sumps to collect the oil, grease and smoke particles filtered out of the exhaust. This not only simplifies servicing but eradicates potentially dangerous spillage from the bottom of the units and greatly cuts down on buildups of grease within the ducting. The ionisation voltage has been designed to run at a negative potential which enhances the ionisation of particles and also produces more ozone which is helpful in reducing cooking odours. This units fit in-line with the kitchen ducting and can be configured modularly to cope with all extract volume requirements.

Autowash Option

An Autowash option can be provided for this system. Once connected to the control / wash station the collection cells can be automatically cleaned at regular frequency. Daily cleaning keeps the filters working at their optimum efficiency and will greatly reduce the number of service visits required through the year.



Odour counteractant or neutralising system



Manufacturer's name: Purified Air
Model: O.N 100

Technical Specifications

Electrical Supply: 220/240V 50Hz
Max Power Consumption: 40 Watts
Ionisation Voltage 15kV negative
Max Air Volume: up to 4.16m³/sec
Dimensions: H 500mm /W 400mm D 200mm
Weight: 12.25 Kg

Purified Air use patented technology to scientifically treat cooking odours emitted by commercial kitchen and restaurant exhausts. Once the airstream in the exhaust duct has had the majority of the particulate contaminates removed by the Electrostatic precipitators units the gaseous phase or malodour can then be treated by the O.N. 100.

The vapour from a specially blended neutralising agent, ELIMINODOR, is mixed with ambient air drawn into the O.N. 100 and ionised to a negative potential of 15,000 volts. This ionised vapour then passes along a nonconductive tube to be discharged into the centre of the duct via a venturi spigot, the metal ducting is earthed through the same high tension circuit which makes the contaminant at an opposite potential to the negatively charged ELIMINODOR vapour. This then causes the negative and positive particles to combine, so treating the malodour by chemical reaction.



Extractor Fan:

Manufacturer's name: Swegone

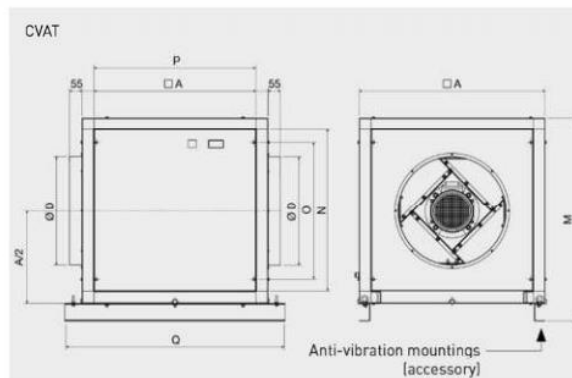
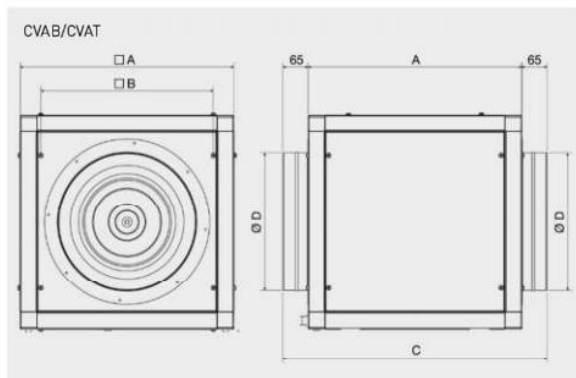
Model : CVAT/6-14000/630

Extraction rate: 3.9 m3/s

Dimension(mm): 980x980x980

Diameter extract ductwork: 630mm

DIMENSIONS (mm)



Model	A	B	C	Ø D
/4-700/200	400	192	530	200
/4-1200/250	450	242	580	250
/4-1500/250	500	292	630	250
/4-2600/355	550	342	680	355
/4-3800/355	650	442	780	355
/4-5600/400	800	591	930	400

Model	A	Ø D	Q	M	N	O	P
/4-9000/500	860	500	1020	940	774	655	754,4
/6-6000/500	860	500	1020	940	774	655	754,4
/6-10000/630	920	630	1080	1000	834	715	814,4
/6-14000/630	980	630	1140	1060	894	775	874,4
/6-17000/710	1037	710	1197	1117	951	831,5	931,4

Model	Speed (rpm)	Max. abs. power (W)	Maximum absorbed current (A)	Max. airflow (m³/h)	Sound pressure level (dB(A) at 1,5 m)			Weight (kg)	Optional speed controller		
					Outlet	Inlet	Radiated		REB	RMB/RMT	
SINGLE PHASE 4 POLE											
CVAB/4-700/200	1375	62	0,3	690	44	46	32	26	REB-1N	RMB-1,5	
CVAB/4-1200/250	1340	115	0,57	1.150	47	51	35	30	REB-1N	RMB-1,5	
CVAB/4-1500/250	1380	160	0,72	1.520	52	54	42	38	REB-1N	RMB-1,5	
CVAB/4-2600/355	1350	275	1,2	2.600	55	60	42	46	REB-2,5N	RMB-1,5	
CVAB/4-3800/355	1380	570	2,6	3.750	60	63	48	62	REB-5	RMB-3,5	
CVAB/4-5600/400	1380	1100	4,8	5.600	66	70	52	94	REB-5	RMB-8	
Model	Speed (rpm)	Max. abs. power (W)	Maximum absorbed current (A)	Max. airflow (m³/h)	Sound pressure level (dB(A) at 1,5 m)			Weight (kg)	Optional speed controller	Optional variable frequency inverter	
					Outlet	Inlet	Radiated				
THREE PHASE 4 POLE											
CVAT/4-700/200	1375	62	0,3	690	44	46	32	26	RMT-1,5	VFTM TRI-0,37 VFKB-45	
CVAT/4-1200/250	1340	115	0,6	1.150	47	51	35	30	RMT-1,5	VFTM TRI-0,37 VFKB-45	
CVAT/4-1500/250	1380	160	0,9	1.520	52	54	42	38	RMT-1,5	VFTM TRI-0,37 VFKB-45	
CVAT/4-2600/355	1350	275	1,4	2.600	55	60	42	46	RMT-1,5	VFTM TRI-0,37 VFKB-45	
CVAT/4-3800/355	1380	570	2,6	3.750	60	63	48	62	RMT-2,5	VFTM TRI-0,55 VFKB-45	
CVAT/4-5600/400	1380	1100	3,1	5.600	66	70	52	94	RMT-2,5	VFTM TRI-0,55 VFKB-45	
CVAT/4-9000/500	1475	2050	8,3	8.800	75	76	60	105	-	VFTM TRI-2,2 VFKB-48	
THREE PHASE 6 POLE											
CVAT/6-6000/500	960	900	5,7	3,3	5.700	65	67	53	105	-	VFTM TRI-1,5 VFKB-45
CVAT/6-10000/630	975	1500	6,7	3,9	10.000	69	70	53	120	-	VFTM TRI-1,5 VFKB-45
CVAT/6-14000/630	965	2500	-	5,4	14.000	73	74	58	160	-	VFTM TRI-2,2 VFKB-48
CVAT/6-17000/710	965	4600	-	9,3	17.100	76	78	60	220	-	VFTM TRI-4 -

ACOUSTIC CHARACTERISTICS

Sound power level spectrum in dB(A) at the corresponding frequency band (Hz):

Model		dB(A)							
		63	125	250	500	1000	2000	4000	8000
CVAB-CVAT/4 700/200	Outlet	39	48	52	53	52	49	45	42
	Inlet	36	45	51	56	55	51	49	43
	Radiated	31	42	43	37	36	30	29	27
CVAB-CVAT/4 1200/250	Outlet	42	53	53	55	56	52	52	44
	Inlet	37	49	54	60	58	56	60	48
	Radiated	33	44	43	38	38	33	35	28
CVAB-CVAT/4 1500/250	Outlet	53	63	58	60	59	56	53	46
	Inlet	45	54	62	65	59	56	53	42
	Radiated	45	54	49	45	43	36	33	29
CVAB-CVAT/4 2600/355	Outlet	48	59	65	63	63	60	58	53
	Inlet	41	59	69	71	63	63	64	63
	Radiated	38	51	53	45	44	38	39	35
CVAB-CVAT/4 3800/355	Outlet	57	64	69	66	69	64	63	55
	Inlet	54	64	73	72	68	64	59	63
	Radiated	49	57	59	50	52	44	43	39
CVAB-CVAT/4 5600/400	Outlet	64	65	71	73	77	70	66	61
	Inlet	59	64	73	75	82	76	75	71
	Radiated	56	59	62	57	60	50	53	45
Model		dB(A)							
		63	125	250	500	1000	2000	4000	8000
CVAT/4 9000/500	Outlet	47	69	72	76	89	81	69	62
	Inlet	59	76	81	86	88	86	70	63
	Radiated	59	64	63	61	73	62	53	47
CVAT/6 6000/500	Outlet	56	66	71	75	76	71	64	54
	Inlet	50	65	72	75	79	71	61	54
	Radiated	49	61	63	60	58	52	48	39
CVAT/6 10000/630	Outlet	65	66	68	78	82	76	63	61
	Inlet	62	68	74	79	81	71	64	52
	Radiated	56	59	58	62	64	69	66	44
CVAT/6 14000/630	Outlet	69	70	73	81	85	73	67	60
	Inlet	62	69	76	79	87	72	64	58
	Radiated	61	64	63	66	68	53	50	44
CVAT/6 17000/710	Outlet	69	72	75	83	89	76	76	64
	Inlet	65	72	76	81	92	76	70	64
	Radiated	60	65	65	67	71	55	52	47

Fit: Will fit into 800mm ceiling space. Access through ceiling tile. Leave sufficient space on top to remove cover. Supported from concrete floor above with screwed rod.

Fire/Smoke: Only extracting from one room, no branches to other rooms.

Noise: No cross talk since only one room on system.

Over 80 dB would be a noisy fan for internal noise.

This fan has an output of no more than 72dB at 125 Hz frequency.

Electrical Data: 250 -400 pascal pressure of 3 kW and three phase rating type CVAT/6- 14000/630 with inverter speed controller, a Swegon inline sound attenuator, type CLA-B 630mm diam and 1200mm long and 9 m of external flue run with two 90° bends, and a louvred grille, or similar capacity equipment.

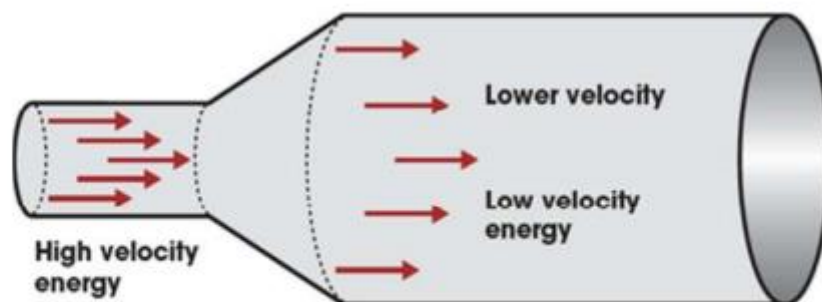
Pressure Drop in ductwork:

Pressure drop = 20Pa.

Fans consume a great deal of energy, and so their efficiency is crucial to preventing waste. The airflow through ducted systems is key to maintaining maximum efficiency. When examining the air flow through a duct, it is convenient to consider the pressures in the flowing air in terms of duct static, velocity and total pressure.

The equation (for a 'frictionless' system) is:

Potential Energy + Pressure Energy + Kinetic Energy = Constant (or Total Energy)



Air moving through gradually expanding duct

Extraction System Notes

All ventilation and duct extraction systems are inside of the curtilage.

The flue are vertically upwards and should terminate at least 1m above the eaves and adequately away from any windows. The external ductwork will be painted with a metal paint finish reducing the visual impact. Finished colour to be agreed with the Local Planning Authority. Please note that the neighbouring property at No.160 also has an external flue to the rear. The ducting is straight to ensure that fumes are discharged as effectively as possible. The duct material (usually galvanised steel) have a smooth internal surface.

A velocity cowl will be installed at termination point to ensure an efflux velocity from the terminus of the ducting with an efflux velocity of between 10-15 m/s.

There will be a fan positioned within the ductwork to pull cooking fumes from the cooker hood to the point of discharge. To aid good dispersion of cooking fumes, the size of the fan motor must be adequate to ensure proper ventilation, the efflux velocity be between 10-15m/s. The final discharge will be vertically upwards, unimpeded by flue terminals.

The fan and motor are sited within the building's structure to minimise outdoor noise. The fan and motor unit are fixed on anti-vibration mounts and be joined to ductwork using flexible couplings to prevent the transmission of vibrations either to the structure or along the ducting.

Noise

Noise from the system shall not exceed 35 dB LAeq (5min) measured 1m from any external part of the system and shall be without any noticeable tonal or impulsive features. The internal noise levels associated with mechanical ventilation and associated ductwork should not be excessive for the restaurant. The fan motor proposed is a Cased fan motor, and a large sound attenuator will be installed inside the restaurant and filters and purifiers will be installed. The extract ducting proposed is rigid in construction, and will be installed with antivibration mountings.

The effectiveness

The effectiveness of any dust extraction system depends greatly on the concept of hood design. The more enclosed the dust source or the closer the capture hood to the emission, the lower the airflow required, thus allowing a smaller system to be installed.

The system performance is dependent upon the extract rate of the air. Where the rate can be adjusted by the use of dampers or a variable speed fan, then the conditions under which the extract rate can be achieved must be described.

The ventilation system should provide sufficient ventilation with the windows closed, equivalent to or better than the natural ventilation requirements of Building Standards.

Cleaning and Maintenance

Cleaning and housekeeping: once a week is recommended (baffle filters)

Maintenance : Monthly inspection and replacement of all filters (baffle filters, prefilters and carbon filters where proposed).

Carbon Filter change every 12 months, Prefilter change every 4 weeks.

Bi-annually Inspection and servicing of fans

Ensure the extraction unit is maintained as advised by the supplier/installer.