QODA
design engineering consultants

Bayham Street – Residential Ventilation Strategy (Planning Condition 13)

Each apartments shall be provided with individual MVHR (mechanical whole house ventilation with heat recovery). The final requirements are dependent on the criteria determined by the specialist air quality and acoustic studies.

The fresh air intake for the MVHR unit shall be through a common vertical shaft down the core of the building. Active carbon filters shall be installed at the top of the shaft to reduce the NO2 levels to an acceptable level (refer to air quality report for full details). Exhaust from the MVHR will be via façade louvers, as indicated on the Architectural elevations and roof drawings.

Each system shall supply filtered fresh air (though NO_2 filter at roof level) to the habitable rooms and draw exhaust air from the bathrooms and kitchen areas. The MVHR shall be sized to match the requirements of the Building Regulations – Part F, and shall be capable of achieving the required air change rate for both summer overheating and "rapid" ventilation.

To achieve 4 ACH/hr for purge/rapid ventilation under Building Regulations Part F, a hybrid approach might also be required on some of the larger apartments. When the MVHR is in boost mode it will achieve 2 to 4 ACH depending on apartment size. Therefore any short fall can be overcome by using the open-able windows.

The MVHR unit shall extract from wet rooms (i.e. bathrooms/WC/utility rooms) and above the kitchen cooker hood (not directly connected to hood). The kitchen extract hoods (specified by the architect) shall be a type which re-circulates rather than discharging to atmosphere.

Horizontal distribution within the apartment will be via the high level ceiling voids in self-extinguishing u-PVC ductwork. Grilles will be ceiling/wall mounted in each living room, bedroom, kitchen and bathroom. Attenuators (or acoustically lined plenum boxes) shall be provided as required for the fresh air inlet and exhaust outlets to atmosphere.

A further overheating study will be completed at the next stage of design to confirm the final air volumes required to each apartment. The current design allows for a single MVHR unit per apartment to mitigate the anticipated overheating, acoustic and air quality issues

As NO_2 levels exceed recommended background levels special consideration has be given to the air quality report and planning condition 13. Based on the current information detailed in the air quality report an active carbon filter at the top of a common intake shaft will provide fresh air to all apartments.

The filter shall be located so it is fully accessible for removal, cleaning, replacement and maintenance. Refer to architectural GA for location and access to fresh air intake.

Details of a typical MVHR unit and an example of an impregnated active carbon filter that could be used have been appended to this strategy for information. These are provided as guidance to identify the level of filtration that will be provided to comply with planning condition 13.

LEADERS IN AIR FILTRATION TECHNOLOGY

PR™ Range - *Activated Carbon Filters*

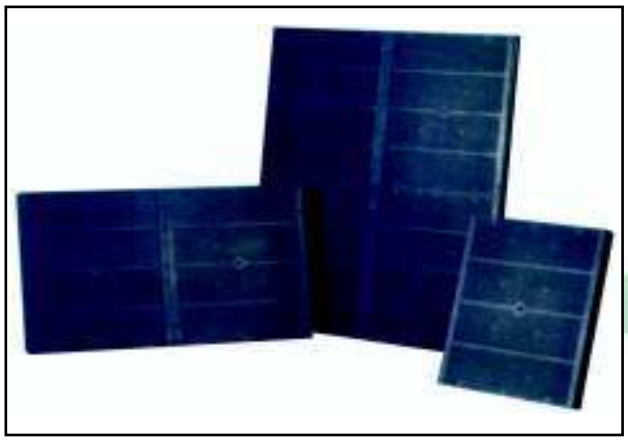
Introduction

AAC PR™ - A low cost range of plastic refillable activated carbon filters with re-usable filter trays.

Manufactured from high quality virgin injection moulded plastic and assembled at our site in Brownhills, these filters have a removable sealing strip fitted at either end enabling the granular or pelletised media to be easily poured out and then recharged.

The PR™ Range Filters:

Type		Nominal Dimensions
Standard	'A'	562mm x 605mm x 25mm
	'B'	562mm x 302mm x 25mm
	'C'	281mm x 302mm x 25mm
Double	'A'	562mm x 605mm x 50mm
	'B'	562mm x 302mm x 50mm
	'C'	281mm x 302mm x 50mm
Treble	'A'	562mm x 605mm x 75mm
	'B'	562mm x 302mm x 75mm
	'C'	281mm x 302mm x 75mm



AAC PR Filters - 'B', 'A' and 'C' sizes respectively

Typical Applications

•Air intake systems •Sewage treatment works
•Airports •Museums •Art galleries
•Offices •Laboratory intake/systems
•Manufacturing processes
•Solvent fume removal •Bus garages
•Tanker fill points •Restaurants
•Vehicle production lines •Food industry
•Corrosion control for electrical/control rooms
•Welding fumes •Plenum chambers

Features & Benefits of the PR™ Range

- Low initial cost
- Refillable filter system enabling substantial reductions in running costs
- Multi compartments to prevent media settlement/compaction and any consequential air by-pass
- Durable, especially against certain corrosive contaminants, acid etc.
- Filters normally available ex-stock
- Ability to withstand air temperatures up to 70°C under normal circumstances (or even 120°C for special applications)
- Non standard filter sizes can be manufactured to suit existing installations
- Filter construction available in wide variety of plastic materials to suit special applications

Address: AAC Eurovent Ltd, AAC House, Unit K Maybrook Industrial Estate, Maybrook Road, Brownhills, West Midlands WS8 7DG. UK.
Tel: 08444 77 4884 **Fax:** 08444 77 4797 **International Callers Tel:** +44 (0) 1543 379823
Email: sales@aaceurovent.co.uk **Website:** www.aaceurovent.co.uk

LEADERS IN AIR FILTRATION TECHNOLOGY

Activated Carbon/Adsorption Media Index

The following list shows substances where excellent removal is obtained using Activated Carbon and other adsorption media.

Acetic acid
Acetic anhydrite
Acrylic acid
Acrylonitrile
Adhesives
Alcohol
Alcoholic Beverages
Ally chloride
Amyl acetate
Amyl alcohol
Amyl ether
Aniline
Antiseptics
Asphalt fumes

Bathroom smells
Benzaldehyde
Benzene
Body odours
Bromine
Burned flesh
Burned food
Butanone
Butyl acetate
Butyl alcohol
Butyl cellosolve
Butyl chloride
Butyl ether
Butylaldehyde
Butyric acid

Camphor
Cancer odour
Coproaldehyde
Caprylic acid
Carbolic acid
Carbon disulphide
Carbon tetrachloride
Cellosolve
Cellosolve acetate
Charred materials
Cheese
Chlorobenzene
Chlorobutadiene
Chloroform
Chloronitropropane
Chloroapicrin
Cigarette smoke
Citrus and other fruit
Cleaning compound

Cooking odours
Creosote
Cresol
Crotonoldehyde
Cyclohexanane
Cyclohexanol
Cyclohexanone
Cyclohexene

Dead animals
Decane
Decaying substances
Decomposition odours
Decorating odours
Deodorants
Detergents
Dibromoethane
Dichlorobenzene
Dichlorosflouromethane
Dichloroethylene
Dichloroethyl ether
Dichloronitroethane
Dichloropropane
Dicyclopentadiem
Diethyl ketone
Dimethysulphate
Dioxane
Dipropyl ketone
Disinfectant

Embalming odours
Epichlorhydrin
Essential oils
Ethyl acrylate
Ethyl benzene
Ethyl bromide
Ethyl mercaptan
Ethyl silicate
Ethylene chlorhydrin
Ethylene dichloride
Euclyptole

Female odours
Fertilisers
Fish odours
Floral scents
food aromas
Freon 11
Freon 12
Freon 113

Gangrene
Garlic
Gasolene

Heptane
Heptylene
Hospital odours
Household smells

Incense
Indole
Iodine
Iodoform
Irritants
Isophorone
Isopropyl acetate
Isopropyl chloride
Isopropyl ether

Kerosene
Kitchen odours
Krypton delay

Lactic acid
Leather
Lingering odours
Liquid fuels
Liquor odours
Lubricants
Lysol

Masking agents
Medicinal odours
Melons
Menthol
Mercaptans
Mesityl oxide
Methy butyl ketone
Methyl cellosolve acetate
Methyl cellosolve
Methyl chloroform
Methyl methacrylate ester
Methyl ethyl ketone
Methyl isobutyl ketone
Methyl mercaptan
Methylcyclohexane
Methylcyclohexanol
Methyl glycol
Methylcyclohexanone
Methylene chloride

Mixed odours
Monochlorobenzene
Monofluro-trichloremethane
Moth balls

Naptha (coal tar)
Naptha (petroleum)
Napthalene
Nicotine
Nitro benzenes
Nitroethane
Nitroglycerine
Nitromethane
Nitropropane
Nonane

Octalene
Octane
Octene
Odours
Odorants
Onions
Organic chemicals
Ozone

Packing house odours
Paint odours
Palmitic acid
Paper deteriorations
Paradichlorbenzene
Paste and glue
Pentanone
Perchloroethylene
Perfumes,cosmetics
Perspiration
Pesticides
Pet odours
Phenol
Pitch
Plastics
Poultry odours
Propionic acid
Propyl acetate
Propyl alcohol
Propyl chloride
Propyl ether
Propyl mercaptan
Putrescine
Pyridine
Rancid odours

Resins
Reodorants
Ripening fruits
Rubber

Sauerkraut
Sewer odours
Skatole
Smog
Smoke
Soaps
Sour milk
Spilled beverages
Spoiled foodstuffs
Stale odours
Stoddard solvent
Stuffiness
Styrene monomer
Sulphur compounds

Tar
Tetrachloroethane
Tetrachloroethylene
Theatrical makeup odours
Thiophene
Tobacco smoke
Toilet odours
Toluene
Toluene di isocyanate
Toluidine
Trichloroethylene
Trichloroethane
Turpentine

Urea
Uric acid

Valeric acid
Valericaldehyde
vinyl acetate
Vinyl chloride mononer
Vapours
Varnish fumes
Vinigar

Waste products

Xylene
Xenon delay

The following substances have good collection results with either standard activated carbon, Impregnated activated carbon or alternative adsorption media.

Acentonitrile
Acetaldehyde
Acetone
Acetylene
Acids
Acrolein
Amines
Ammonia
Animal odours
Anaesthetics

Bacteria
Bleaching solutions
Butadiene
Butane
Butylene
Butyraldehyde

Carbon dioxide
Chlorine
Coal smoke
Combustion odours
Corrosive gases

Dichlorodiflouromethane
Dichloromonoflouromethane
Dichlorotetraflourethane
Diesel fumes
Diethyl amine
Dimethyl sulphide

Ethyl bromide
Ethyl chloride
Ethyl ether
Ethyle formate
Ethylene oxide

Exhaust fumes
Film processing odours
Flourotrichloromethane
Formaldehyde
Formic acid
Fumes

Hexane
Hexene
Hexyne
Hydrogen sulphide
Hydrogen selenide
Hydrogen bromide
Hydrogen chloride
Hydrogen cyanide
Hydrogen flouride
Hydrogen iodine

Incomplete combustion
Industrial waste
Isoprene
Methyl alcohol
Methyl acetate
Methyl bromide
Methyl ether
Methyl formate
Mildew
Mould

Nitric acid
Nitrogen dioxide
Noxious gases

Pentane
Phosgene
Poison gas

Pollen
Propionaldehyde
Putrifying matters
Radio active iodine

Sulphuric acid
Sulphur dioxide
Sulphur trioxide
Slaughtering odours
Sewer odours

Vinyl chloride
Viruses
Volatile organic compounds

wood alcohol

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Lo-Carbon
Sentinel Kinetic® Plus
MVHR Unit

Features & Benefits

- Recognised in SAP Appendix Q
- Ultra quiet
- Horizontal duct option for space-saving installations
- High airflow, ideal for student accommodation clusters
- Unique folding filter for removal when access is restricted
- Integrated digital controller for simple and accurate commissioning
- Lightweight for easy installation
- Plug and play controls; Humidistat, Ventwise, Wireless Remote
- BMS connectivity
- LS inputs (Light Switch)
- Volt-free inputs
- Self diagnosis for simplified fault finding
- Adjustable delay On/delay Off timer
- Summer bypass and frost protection

Increased Performance

The Sentinel Kinetic Plus benefits from the latest high efficiency, backward curved impeller design, ensuring the lowest possible energy consumption, ultra quiet operation and an exceptional performance range covering small one bed apartments to the largest of houses.

Care Homes & Student Accommodation

The Sentinel Kinetic Plus is ideal for larger homes and multiple occupancy units such as care homes and student accommodation. Capable of 400m³/hr at 150Pa, the unit can extract from up to ten bathrooms and a communal kitchen while still achieving almost 90% heat recovery. The fully automatic capability of the Kinetic range means that adequate ventilation is always achieved.

The Kinetic's BMS capability is also ideal for those commercial applications where landlords or property managers want to monitor and optimise building performance and maintenance. The Kinetic BMS can provide status information and its self diagnostics can report if any fault is found.

Spigot Options

Spigots may be re-positioned to give horizontal connection or a combination of vertical and horizontal connection.

Optional 180mm/200mm spigots can simplify connection in commercial installations where larger diameter duct work has been used.

Quick Change Filter

As many systems are placed within cupboards the unique filter design folds as you remove it to ensure easy access in restricted spaces.

Integral Humidity Sensor

The integral humidity sensor increases speed in proportion to relative humidity levels, saving energy and reducing noise. The sensor also reacts to small but rapid increases in humidity, even if the normal trigger threshold is not reached. This unique feature ensures adequate ventilation, even for the smallest wet room. The night time relative humidity setback feature suppresses nuisance tripping as humidity gradually increases with falling temperature.

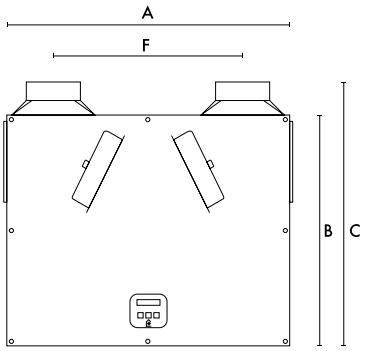
Models

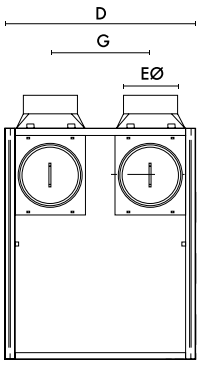
	Stock Ref
Kinetic Plus B Right	443028
Kinetic Plus B Left	443028L

Accessories

Model	Stock Ref
Wired Remote Controller	443283
Wireless Enable Kit	441865
Wireless Transmitter Controller	437827
Ventwise Controller	441780
LED Alarm with 15m cable	448356
Opto-coupler For volt-free bms connection	447340
Kinetic Spare Filters 2 pk.	443351
M5 Pollen Filter	444201
180mm/200mm Spigot Kit (One per pack)	446523

Dimensions (mm)





A	B	C	D	EØ	F	G
785	635	722	550	150	520	275

Weight: 24kg

SAP PCDB Test Results

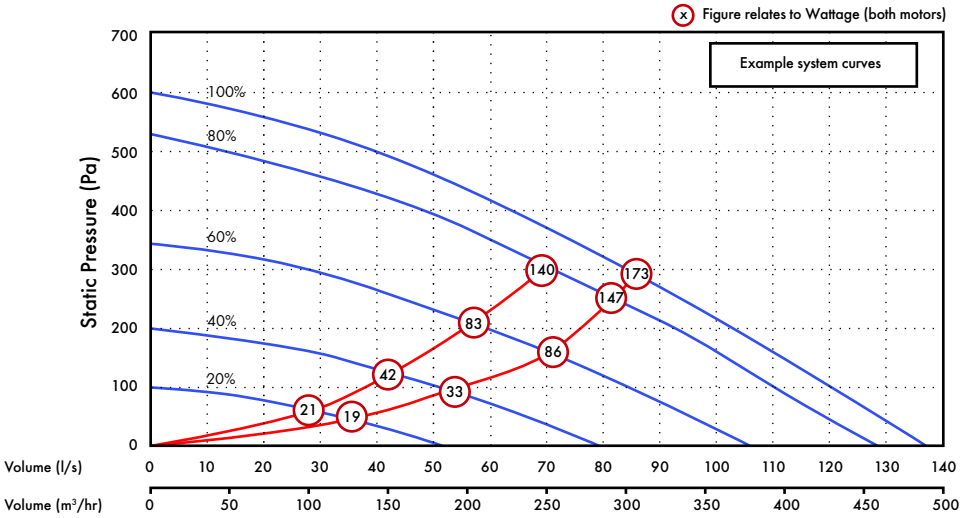
	Thermal Efficiency %	SFP (W/l/s)
K+1	91	0.51
K+2	91	0.40
K+3	90	0.41
K+4	90	0.45
K+5	90	0.53
K+6	90	0.60
K+7	90	0.70

Sentinel

BEAB Approved

Performance

Fan speeds are fully adjustable within the performance range.



Sound Data

			Octave band, Hz, dB SWL								SPL dB(A)
Flow l/s	Unit setting	Test mode	63	125	250	500	1k	2k	4k	8k	at 3m
50	20%	Supply	46.5	54.3	46.4	44.8	36.2	28.5	24.5	31.2	28.5
		Extract	46	52.2	42.3	38.7	27.6	24.2	24	31.7	25
		Breakout	48.5	42.6	43.3	38.9	35.8	29.3	23.8	30.7	22.8
78	40%	Supply	50.3	59.1	54.5	56.5	47	39.9	26.3	31.7	38
		Extract	46.8	51.6	47.8	44.4	32.7	27.4	24.4	31.7	28
		Breakout	48.4	51.2	53.4	46	41	34.6	25	30.3	28.5
104	60%	Supply	52.4	57.2	60.4	60.9	55.8	50.3	33.1	33.9	43.6
		Extract	50	49.8	56.8	52.4	40.2	35.9	33.4	39.8	35.2
		Breakout	55	49.6	59.7	54.5	46.9	39.9	33.6	39.2	34.9
127	80%	Supply	54.9	60.7	67.4	66.6	61.8	56	39.6	37.7	49.5
		Extract	50.4	52	61.2	56.6	45.1	39.6	34.2	40.2	39.1
		Breakout	53.5	53.4	60.8	59.1	53	45.3	36	40.1	38.7
137	100%	Supply	54.7	61.7	70.5	69.9	62.7	57.5	42.1	38.3	52
		Extract	54.4	55.1	65.8	57.5	46.9	40.6	33.7	40	41.8
		Breakout	56.6	54.6	60.5	60.7	54.7	45.9	36.5	39.6	40

Consultants Specification

Operation

The supply and extract ventilation unit shall be as Sentinel Kinetic Plus as manufactured by Vent-Axia and shall be sized as indicated on the drawings and shall be in accordance with the particular specification.

Supply air to the room shall be pre-heated by the extract air via the integrated composite plastic counterflow heat recovery cell. The Sentinel Kinetic Plus shall automatically vary the ventilation rate via EC/DC motors, as it receives signals from one of the optional interconnected sensors.

When a signal is received, the fans shall either vary their speed proportionally or on a trickle and boost principle.

The unit shall have the facility to commission the supply and extract fans individually via in-built minimum and maximum speed adjustment, or alternative wired remote control unit. The fans themselves shall have independent, infinitely variable speed control.

Unit specification

The unit shall be manufactured with an ABS outer case construction, and incorporate a reversible core to allow for left or right hand mounting.

The unit shall have a high efficiency composite plastic counterflow heat exchanger, supply and extract filters, automatic summer bypass, integral minimum and maximum infinitely variable speed controls with facia mounted failure indication.

The unit shall have low energy, high efficiency EC/DC fan/motor assemblies with sealed for life bearings. The impellers shall be high efficiency backward curved centrifugal type.

The unit shall have a heat exchanger cell with a thermal efficiency of up to 92% when tested to EN 308. This shall be protected by G3 grade synthetic filters on supply and extract. Complete with a condensate drip tray and drain connection.

The unit shall be constructed with a removable Core allowing full maintenance access. The removable Core shall provide access to the following:

- ✓ Supply and extract filter
- ✓ Heat exchanger
- ✓ Access to the electrical connections

Access shall be provided for wiring termination and setup/commissioning. The backlit LCD user interface therein may be duplicated for remote mounting if required. Units shall be as manufactured by Vent-Axia Ltd.

Standard controls

All Sentinel Kinetic units shall incorporate the following functions integrally mounted, pre-wired and factory fitted by the manufacturer:

- ✓ Integral infinitely variable fan speed control on supply and extract
- ✓ Integral min/max ventilation control/set point
- ✓ Integral BMS input/output interfaces – control and status indication
- ✓ Heating interlocks
- ✓ 0-10V proportional speed adjustment
- ✓ Volt free contacts
- ✓ 24V sensor supply
- ✓ Integral on/off or trickle boost function from remote switch, e.g. PIR occupancy detector
- ✓ Fully automatic summer bypass
- ✓ Switched Live input with adjustable 'delay-on' feature
- ✓ Fan failure or component failure indicated via individual fault code display
- ✓ Running time counter
- ✓ Control panel PIN number lock
- ✓ Automatic frost protection effective to -20°C
- ✓ The unit shall incorporate an integral humidity sensor with the following features:
  - Ambient Response; Raises the humidity trigger point as dwelling temperature reduces
  - Rapid Response: Monitors the rate of change in humidity and triggers increased airflow even if the humidity trigger threshold is not reached
  - Proportional Response; Incrementally increases the fan speed to reduce noise and reduce energy consumption
- ✓ The unit shall be controlled by the 'Sentinel' control devices (enablers and sensors) as detailed in the schedule or on the drawings.
- ✓ Tool free filter access

Airflow Direction