PROPOSED VENTILATION SYSTEM AT

Former The White Horse, York Street, Clitheroe, BB7 2DH

aewarchitects.com

CONTENTS:

1.0 INTRODUCTION:

The information contained within this document should be used as supporting information when applying for Change of Use Planning Approval and is based on the '*DEFRA Annex B – Guidance on the control of odour and noise from Commercial* Kitchen *Exhaust system – Jan 05'*. This follows feedback from various Local Authorities who use Annex B as a guide when referring to the extract system as part of the application process.

Annex B advises that the aim of any ventilation/extraction is to ensure that no nuisance, disturbance or loss of amenity is caused by odour, fumes, food droplets or noise, to nearby properties.

Additionally, the visual appearance of the flue may be important and the flue itself may require a separate planning permission. Enquiries should be made to the Local Authority Planning Department regarding this matter.

A suitably qualified and experienced person with specialist knowledge of ventilation schemes should undertake the design and installation of a ventilation system.

Designing and installing appropriate ventilation systems may involve considerable expense.

In circumstances where the end user of the premises is unknown, or where the specific type of food to be cooked is unknown, the installation should be designed to achieve the highest level of odour control in order to cater for a worst case scenario.

There are many different types of odour abatement available (carbon filters, electrostatic precipitation, high dilution and high velocity extraction) however not all types are suitable for all cooking methods. In each case, grease filters must be installed.

2.0 PREAMBLE

All work is carried out in accordance with the latest relevant British (or Irish regulations where applicable) and European Standards, statutory Regulation and ByeLaws together with the following publications:

- CIBSE Codes and guides to current practice
- Water Authority Bye Laws
- HVCA – DW143 Practical Guide to Ductwork Leakage Testing
- HVCA DW144 Specification for Sheet Metal Ductwork
- HVCA DW172 Guide to Good Practice for Kitchen Ventilation Systems
- HVCA – RUAG70 Guide to Good Practice Refrigeration
- The Building Regulations
- Gas Safety (Installation and Use) Regulations 1998

All plant, ducts, pipe cables etc. shall be adequately protected against accidental damage corrosion and external environment and shall be capable of safe decontamination and removal in the future without disturbing other services. Pipes and ducts shall be adequately sized, kept as short as practicable, leak-proof with a minimum number of joints and have provision for routine maintenance. All facilities shall be designed to prevent the ingress or egress of rodents, vermin, and insects.

The duct will be fixed to the shell of the unit using anti-vibration fixing mounts and under no circumstances will flexible ductwork be used other than the fan connections

The HVAC contractor shall supply the client with system design drawings, prior to manufacture and installation

For projects in England and Wales, the HVAC contractor shall also demonstrate compliance with Building Regulations Approved documents L2A & L2B. This will include:

(a) Provision of details of the efficiency and controls of heating , cooling and ventilation systems in accordance with Non-Domestic Heating, Cooling and Ventilation compliance Guide (2006)

(b) Provision of commissioning certificates including air leakage tests on the ductwork

Fire/smoke dampers shall be installed in all fire compartment walls to Building Control requirements

The HVAC contractor shall ensure that externally, the ductwork conforms to the supplied drawings in terms of its route, height and termination. These drawings

will have formed part of the planning permission and must not be deviated from without prior consultation with the Project Manager / Architect.

Upon completion of the installation, all shall be fully tested and proved including airflows. The Contractor shall produce an Operating and Maintenance Manual which shall contain details of all equipment supplied; a record drawing of the complete mechanical services installation and copies of all Test Certificates. It shall contain a Maintenance Schedule based on the manufacturer's recommendations.

3.0 INFORMATION ON TYPE OF OPERATION

The proposed operation will produce approximately 100 meals per day on average.

All meal types served shall consist of dry oven-baked goods and side dishes. No frying shall take place. The exhaust air generated by the baking process consists mainly of water vapour, with little or no grease / fat / oil content.

The proposed hours of operation of the business and ventilation plant will be in accordance with the hours stated in the relevant planning consent notice(s).

4.0 PLANS AND DRAWINGS

Please refer to drawing B9725-AEW-PJ000968-ZZ-DR-0003 of the proposed premises which shows the indicative internal arrangement and location of the ventilation system.

Please refer to drawing B9725-AEW-PJ000968-XX-DR-0004 for proposed elevations of the unit which shows the external location of the ventilation system.

A schematic drawing produced by the HVAC Designer will be provided at a later date.

5.0 DETAILED DESIGN OF VENTILATION SYSTEM

5.1 Pre-filters (fresh air system)

A copy of the manufacturer's product data sheet should be supplied clearly showing:

- Manufacturer's name: Jasun Filtration
- Filter name and product code: Type 90 and VL2 Panel Filter

- Dimensions of the pre-filter: 45mm thick (rated airflow2.0m/s) see data sheets
- Nature of the filter media: Disposable 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 under: 3 monthly maintenance

5.2 Electrostatic precipitators (NOT REQUIRED ON THIS SITE – SEE 5.9 CARBON FILTERS)

5.3 Odour counteracting or neutralising system (NOT REQUIRED ON THIS SITE – SEE 5.9 CARBON FILTERS)

5.4 Cooker hood

The following information on the characteristics of the cooker hood should be supplied that clearly shows:

- The hood will made of: Stainless Steel construction with all visible joints to be welded, ground and polished and to incorporate a gutter around all edges with a plugged drain connection at lowest point.
- Length that the cooker hood overhangs the appliances: 200mm all round
- Face velocity at the cooker hood (metres per second): 0.25cu/m/s
- Dimensions of the opening of the cooker hood= 2m x 3m

The hood will include 6 no. mesh type grease filters, aluminium frame with mesh inserts:

- Manufacturer's name: Jasun Filtration
- Filter name and product code: Model GF (approx. 450mm x 450mm)

The extract system is predominantly removing heat and gas combustion fumes. Mesh filers are much more efficient at removing any fine particles which may be caught in the air flow.

There is not barrier to flame within the filter, and it is accepted that mesh filters cannot therefore be used on their own in applications where there is appreciable risk of fire. However this does not apply in this operation.

5.5 System Operation

In addition to the specification of the components the following must be provided about the system:

- Proposed extract rate (expressed as m^3/second): 1.5m^3/s
- Dwell time of the gases in the carbon filtration zone: 0.2 – 0.4s

- Volume of the kitchen: based on average prep area size of 100 - 150cu/m
- Efflux velocity: 11m/s

Note: The system performance is dependant 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. Single speed fan: no adjustment.

5.6 Flue Design

The height and velocity of the final discharge are the two important factors. Generally, the greater the flue height, the better the dispersion and dilution of odours. The discharge of air should be at a minimum height of 1m above the roof ridge, especially if there are buildings nearby that may affect odour dispersion and dilution.

Where this is not possible (e.g. because of ownership or structural constraints), additional techniques will be required in order to reduce odours, such as an increase in efflux velocity and additional filters, etc. The final discharge should be vertically upwards, unimpeded by flue terminals. The number of bends in the ducting should be minimised and the ducting should have a smooth internal surface.

Details of proposal: Proposed 500mm dia. Oven extract duct work to penetrate through rear wall and terminate horizontally in PPC aluminium louvred wall grille at high level (finished in RAL 7043 Traffic Grey). Oven extract system to be fitted with fine filtration and carbon filters in accordance with **Purified Air report reference RM22513.**

5.7 Noise

Data on the noise produced by the system as a whole should be provided including:

- Sound power levels or sound pressure levels at given distances (the assumptions to this calculation must be clearly stated);
- An octave band analysis of the noise produced by the system should also be provided, where possible; and
- Hours of operation of the ventilation system (where this differs from the hours of opening).

Please refer to Cole Jarman noise assessment report reference 17/0329/R1 and Appendix 1 for data sheets regarding the fans for more information.

5.8 Maintenance

A schedule of maintenance must be provided including details for:

- Cleaning of washable grease filters: Weekly
- Frequency of inspection and replacement of all filters (grease filters, pre-filters and carbon filters where proposed): Monthly
- Inspection and servicing of fans: Bi-annually

Please note that the HVAC contractor will provide 12 months spare filters at each new store.

5.9 Carbon Filters

Please refer to Purified Air risk assessment and specification document reference RM22513_Clitheroe dated 11th July 2017. Please contact Purified Air directly for any additional information with regards to oven extract filtration details / specification. Contact details as follows:

Contact: Rob Martin
Telephone: 0170 8755 414
Mobile: 0777254488
Email: rob@purifiedair.co.uk

6.0 Additional notes for guidance

The air inlets must not permit pests to enter the kitchen. Fly screens are an example of how this can be achieved.

Sufficient air must be permitted into the premises to replace air extracted. The method for supplying this make-up air should be detailed. The route of the air into the kitchen must not result in its contamination, for example passage through a toilet. Separate provision must be made for ventilation of a toilet. There must be sufficient access points to permit adequate cleaning of all the ductwork.

Fresh air is introduced via a dedicated air handling unit to supply 80% of the extracted air, fresh air filtered to EU4 – tempered via a low pressure hot water coil - is introduced via ceiling mounted diffusers to the preparation / office and wash-up areas.

APPENDIX 1

COLDROOM AND AIR CONDITIONING COMPRESSORS

AIR CONDITIONING			**COLD ROOM**	
Model (typical unit)	Mitsubishi H.I. FDC 100VNX		**Model (typical unit)**	Karbox 2464
Dimensions	W 970mm D 350mm H 1300mm		**Dimensions**	W 890 D 560 H 500
Weight	105 kg		**Weight**	78 kg
Airflow	1620 cu.m/h		**Compressor**	Model CAJ2464 34.5cm^3 9.7 MRA 38 LRA
Current	Start N/A Max running current 11.1A		**Refrigerant Connections**	Suction 15.9mm Liquid 9.5mm
Capacity	Cool 10.0 kW Heat 11.2 kW		**Condenser Fan Motor**	220-1 Volts/Phase 0.6 Amps each 2800 m^3/hr Air Flow
Noise	50 dBA @ 1m		**Watts**	4-6kW
			Electrical Details	16 MRA 38 LRA
			Noise	34dBA @ 10m

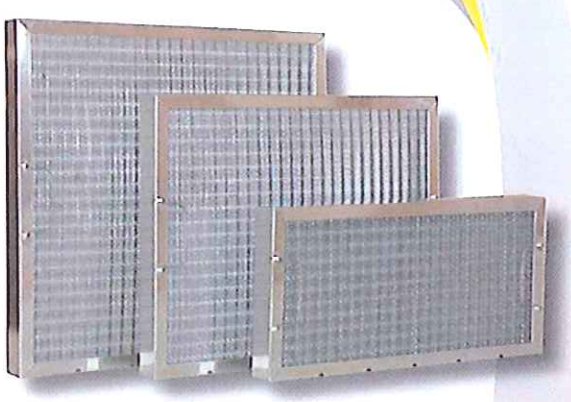
APPENDIX 2

PRODUCT DATA SHEETS

- Jasun Filtration PLC – Type 90 panel Filter (Fresh Air Intake)
- Air Vent Technology – Water heated air handling units (Fresh Air Intake)
- JASUN Filtration PLC – Model GF mesh grease filters (Canopy Filters)
- Vent-Axia – Black Sabre Slim case sickle fans (Extract Fan)

JASUN FILTRATION PLC

Model GF
Mesh Grease Filters



GENERAL DESCRIPTION

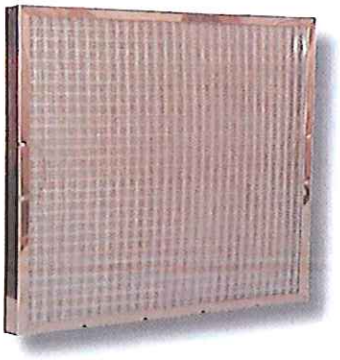
These filters are designed for use in commercial kitchens and ventilation from food preparation areas where their primary function is to reduce grease carry over from the cooking area.
These Filters are rated at 1.5m/sec - where the pressure drop is 15Pa for 45mm filters and less than 10Pa for 20mm filters.

Construction

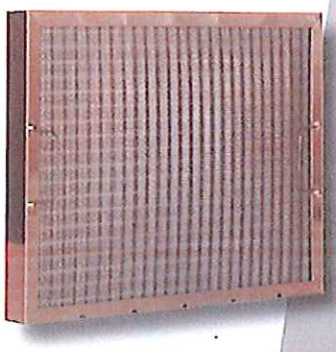
These filters are made from rolled channel frames, with safety edges. Sandwiched between the frame edges are layers of interwoven expanded mesh.

These Filters are available in the frame finishes below - mesh choice is either Galvanised Steel or Stainless Steel.

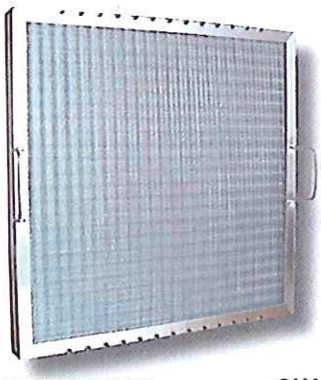
Stainless Steel



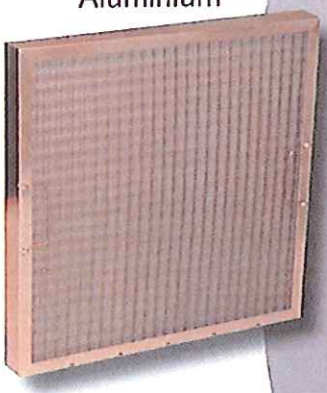
Brushed Stainless Steel



Galvanised Steel



Aluminium



ENVIRONMENT

EMS 81914
BS EN ISO 14001:2004

QUALITY

FM 29257
BS EN ISO 9001:2000

Jasun Filtration Plc
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Bridgwater, Somerset.
TA6 5LB
United Kingdom

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Fax: +44 (0) 1278 450873
Info@jfilters.com
Http://www.jfilters.com

JASUN FILTRATION PLC

G3

Type 90 Panel Filter

GENERAL DESCRIPTION

The Type 90 panel filter is a disposable product offering a basic level of filtration, or pre-filtration in HEVAC applications.

Construction

This product is constructed by bonding a pad of smartglass fibre into a water repellent AquaKote® card frame

Filter Efficiency to BS EN 779		G3
Filter Thickness	Rated Airflow	Initial Pressure Drop
20mm	1.5m/sec	18Pa
45mm	2.0m/sec	50Pa
Final Recommended Pressure Drop		150Pa

Features

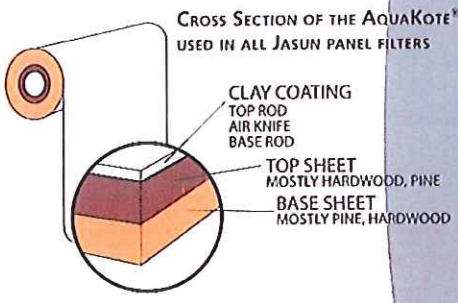
The Frame is made from AquaKote card which has

- Superior tear resistance when wet
- Great dry tear resistance and
- Manufacturered from a renewable source.

The Glass Fibre media

- Is made from a recycled products
- Has a graduated density to provide great depth loading of dirt
- Is available any size
- Is Takified to provide improved efficiency
- Is very inexpensivė

Cross Section of the glass fibre media used in Type 90 Panel Filters



Cross Section of the AquaKote® Card used in all Jasun panel filters

ENVIRONMENT

EMS 81914
BS EN ISO 14001:2004

QUALITY

FM 29257
BS EN ISO 9001:2000

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JASUN FILTRATION PLC

G4

V Line
Pleated Panel Filter

GENERAL DESCRIPTION

The V Line pleated Panel filter is a standard capacity disposable product offering a better than basic level of filtration, or pre-filtration in HEVAC applications. This product is made using patented Kimberly Clark media which delivers a constant level of filtration over its life.

Construction

This product is constructed by bonding a pleat pack of Intrepid V Line media into a water repellent AquaKote card frame

Features

The Frame is made from AquaKote card which has

- Superior tear resistance when wet
- Great dry tear resistance and
- Manufactured from a renewable source.

The Patented Kimberley Clark Intrepid media

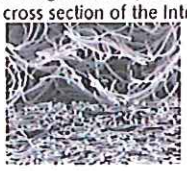
- Has a Graduated Density for even dirt loading , resulting in greater dust holding
- Hydrophobic – so will not load with moisture in the air
- Has a constant efficiency due to its extra electrostatic charge
- Superior Efficiency V's Particle size (see table)
- Has a low pressure drop
- Is made form continuous fibres so will not shed

Filter Efficiency to BS EN 779		G4
Rating to ASHRAE 52.2 Test Standard		Merv 8
Filter Thickness	Rated Airflow	Initial Pressure Drop
20mm	1.5m/sec	60Pa
45mm	2.0m/sec	62Pa
95mm	2.5m/sec	80Pa
Final Recommended Pressure Drop		250Pa

Test Comparing Filtration efficiency V's different sized particles. Intrepid Media V's Cotton Polyerster Filters

Particle Size Rang(mm)	Initial Fractional Efficiency(%)	
	V Line Intrepid	The "best" Cotton Poly Alternative
0.3-0.4	7	2
0.4-0.55	15	6
0.55-0.7	28	11
0.7-1.0	41	19
1.0-1.3	52	24
1.3-1.6	58	28
1.6-2.2	63	32
2.2-3.0	67	36
3.0-4.0	70	37
4.0-5.5	71	38
5.5-7.0	72	38
7.0-10.0	73	39

Hi Magnification photo showing the cross section of the Intrepid media



Coarse

Airflow

Fine

POWERED BY INTREPID Filtration Media

ENVIRONMENT

EMS 81914
BS EN ISO 14001:2004

QUALITY

FM 29257
BS EN ISO 9001:2000

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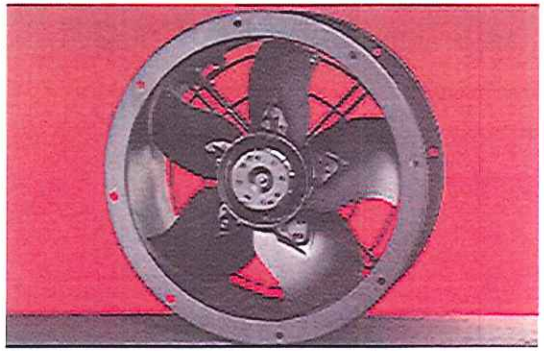
VENT-AXIA
BLACK SABRE SLIM CASE SICKLE FANS (BSC)



- ✓ Sizes 250 to 710 dia are protected to IP54.
- ✓ Motor Insulation Class F up to +70°C
- ✓ 450 to 710 dia, 3 phase motors, 2 speed as standard.
- ✓ All weather epoxy paint finish.
- ✓ Standard Thermal Overload Protection (S.T.O.P.).
- ✓ Performance tested to BS 848 Part 1.
- ✓ 5 Year Guarantee.

BLACK SABRE CASE MOUNTED SICKLE FANS

Black Sabre Sickle bladed fans are the latest addition to the Vent-Axia range offering improved pressure characteristics over axial units and lower sound levels. The advanced blade design and purpose built motor ensure excellent reliability and speed control.

CONSTRUCTION

The Black Sabre range share the same case lengths as the Cased axial range making them fully interchangeable and total compatibility with the full range of Vent-Axia Accessories. The strong and compact short case is constructed from rolled steel plate, electro welded and protected with a tough, epoxy paint finish. Casing dimensions are to **DIN 24151** and flange dimensions are to **ISO 6580.** Manufacture is controlled to **BS EN ISO 9001.** The compact motor/impeller unit is robustly supported within the casing by electro-welded and epoxy coated steel rod mounting supports for ease of installation and service access. Suitable for all weather outdoor environments.

IMPELLERS

The motors and impellers are factory matched, statically and dynamically balanced to VDI 2060 Quality Class G.6.3.

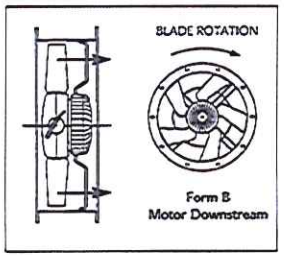
MOTORS

The external rotor motors are specifically designed and styled for this range of fan. Ball bearings are greased for life. Sizes 250-710 motors are protected to **IP54,** against dust and moisture complying with **BS EN 60529.** They have ribbed aluminium body castings for efficient cooling with Motor insulation to Class 'F' (from -40°C to + 70°C). Speed controlled sizes 450 to 710, 6 & 8 pole motors are only suitable for operating temperatures of up to 40°C.

ELECTRICAL

The Sabre range is available for either single phase 220-240V 50 Hz capacitor start and run or three phase 380-415V 50Hz. Motors are fitted with Standard Thermal Overload Protection (S.T.O.P.) which should be wired into all controller circuits and into starter contactors to prevent motor damage due to overloading / overheating. Three phase 380-415V 50Hz units, from 450 to 710 diameter are fitted as standard with 2 speed Delta/Star connection motors. Most units are suitable for speed control by either electronic, voltage reduction or frequency inverters where permissible.

FORM OF RUNNING



Cased mounted fans (ex-stock) are supplied for extract use (Form 'B' running).

TERMINAL BOX

An IP65 terminal box is supplied with all models with 20mm and PGII entry offering protection against dust and water jets from any angle.

PERFORMANCE

The fan performance, is in accordance with tests to BS 848 Part 1.

SOUND LEVELS

Fan sound levels, measured in a reverberant chamber in accordance with BS 848 Part 2. Published dB(A) figures are free field sound pressure levels at 3m with spherical propagation at a reference level of 2 x 10^{-5}Pa (20 micro-Pascal). The sound power level spectra figures are dB with a reference level of 10^{-12} Watts (1 pico-watt). To ensure minimum noise levels during speed control, an auto transformer speed control is recommended.

ACCESSORIES

A full range of accessories is available with the Sabre Slim Cased Sickle fans:

Electronic Speed Controllers.
Auto Transformer Speed Controllers.
Inverter Speed Controller, where permissible.
D.O.L. Starters.
Ancillary Packs.
Flexible Connections.
Mounting Feet.
Coupling Flanges.
Anti-Vibration Mounts.
Attenuators.

Vent-Axia

Vent-Axia

BLACK SABRE SLIM CASE SICKLE FANS PERFORMANCE GUIDE

4 POLE

m³/s at Pa

Dia	Motor	Stock Ref. No	r.p.m	IP Rating	0	25	50	75	100	125	150	175	200	225	250	300	350	Motor kW	SC Amps	FLC Amps	dBA @3m
315	1 phase	BSC315-14	1400	IP54	0.581	0.532	0.463	0.381	0.222	0.179	0.123	0.057						0.12	2.12	0.53	47
	3 phase	BSC315-34	1420	IP54	0.584	0.535	0.465	0.382	0.223	0.180	0.123	0.057						0.13	2.76	0.46	
355	1 phase	BSC355-14	1400	IP54	0.784	0.721	0.638	0.554	0.452	0.258	0.198	0.118						0.12	2.20	0.55	49
	3 phase	BSC355-34	1400	IP54	0.835	0.770	0.682	0.592	0.488	0.282	0.226	0.175	0.083					0.15	2.52	0.56	
400	1 phase	BSC400-14	1360	IP54	1.555	1.458	1.291	1.062	0.583	0.465	0.363							0.32	6.40	1.60	52
	3 phase	BSC400-34	1380	IP54	1.555	1.458	1.291	1.062	0.583	0.465	0.363							0.36	4.40	1.10	
450	1 phase	BSC450-14	1280	IP54	1.962	1.885	1.720	1.602	1.495	1.280	0.860	0.742	0.640	0.508	0.383	0.114		0.63	11.20	2.80	54
	3 phase	BSC450-34*	1340	IP54	1.976	1.891	1.781	1.667	1.514	1.326	0.890	0.748	0.642	0.508	0.382	0.113		0.59	7.80	1.30	
500	1 phase	BSC500-14	1350	IP54	2.667	2.576	2.463	2.301	2.140	1.945	1.682	1.271	1.087	0.915	0.766	0.469	0.229	0.85	15.20	3.80	59
	3 phase	BSC500-34*	1370	IP54	2.708	2.615	2.500	2.336	2.173	1.975	1.708	1.290	1.104	0.929	0.778	0.476	0.232	0.97	11.40	1.90	
560	1 phase	BSC560-14	1300	IP54	3.472	3.337	3.179	3.021	2.840	2.615	2.344	2.029	1.616	1.374	1.172	0.744	0.383	1.30	24.00	6.00	63
	3 phase	BSC560-34*	1340	IP54	3.579	3.440	3.277	3.114	2.928	2.696	2.417	2.092	1.666	1.417	1.208	0.767	0.395	1.40	15.00	2.50	
630	1 phase	BSC630-14	1325	IP54	3.982	3.843	3.657	3.449	3.218	2.963	2.699	2.440	2.176	1.782	1.551	1.180	0.525	1.30	22.80	5.70	67
	3 phase	BSC630-34*	1330	IP54	3.998	3.858	3.672	3.463	3.231	2.975	2.710	2.450	2.185	1.789	1.557	1.185	0.529	1.40	15.00	2.50	

6 POLE

450	3 phase	BSC450-36*	1050	IP54	1.570	1.480	1.374	1.261	1.114	0.724	0.553	0.388	0.219					0.23	3.42	0.57	46
500	3 phase	BSC500-36*	900	IP54	2.336	2.196	2.045	1.894	1.720	1.487	1.092	0.813	0.569	0.348	0.127			0.27	3.72	0.62	48
560	3 phase	BSC560-36*	860	IP54	3.091	2.928	2.777	2.580	2.370	2.138	1.859	1.371	1.022	0.743	0.464			0.45	5.40	0.90	54
630	3 phase	BSC630-36*	880	IP54	3.486	3.277	3.068	2.812	2.556	2.324	2.045	1.720	1.255	0.813	0.464			0.74	9.00	1.50	58
710	1 phase	BSC710-16	860	IP54	4.311	4.013	3.652	3.269	2.840	2.086	1.616	1.330	1.037	0.766	0.518			0.90	16.00	4.00	60
	3 phase	BSC710-36*	920	IP54	4.444	4.137	3.765	3.370	2.928	2.068	1.666	1.371	1.069	0.790	0.534			1.00	15.60	2.60	

8 POLE

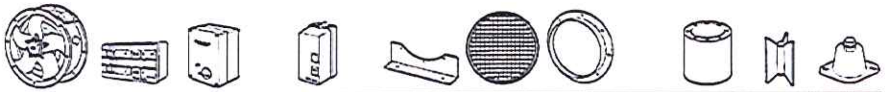
710	3 phase	BSC710-38*	670	IP54	3.280	2.887	2.071	1.170	0.306	0.291								0.46	7.80	1.30	50

S.C. - STARTING CURRENT
F.L.C. - FULL LOAD CURRENT

NOTE: All * models are supplied with 2 speed connection motors as standard. (Sizes 450-630 dia. are 4/6 pole, 710 are 6/8 pole).
DELTA Δ (HIGH SPEED)
STAR - (LOW SPEED)

ONLY SELECT THE FANS TYPED IN RED WHEN CONFIDENT OF YOUR SYSTEM RESISTANCE DATA.

VENT-AXIA
BLACK SABRE SLIM CASE SICKLE FANS
ACCESSORIES



Stock Ref. No.	Electronic controller Stock Ref. No.	Auto transformer Stock Ref. No.	D.O.L starters & overload Stock Ref. No	Mounting feet Stock Ref. No.	Inlet wire guard Stock Ref. No.	Coupling flange Stock Ref. No.	Axial ancillary pack Stock Ref. No.	Cased axial attenuator Stock Ref. No.	Cased axial attenuator pod Stock Ref. No.	Anti-vibration mount Stock Ref. No.
BSC315-14	W103 03 102M	103 14 103	103 11 240 + 103 12 007	105 03 315	105 05 315	105 06 315	105 13 315	105 14 315	105 15 315	105 23 033
BSC315-34	-	103 14 301	103 11 415 + 103 12 007							
BSC355-14	W103 03 102M	103 14 103	103 11 240+ 103 12 007	105 03 355	105 05 355	105 06 355	105 13 355	105 14 355	105 15 355	105 23 033
BSC355-34	-	103 14 301	103 11 415 + 103 12 007							
BSC400-14	W103 03 102M	103 14 103	103 11 240 + 103 12 027	105 03 400	105 05 400	105 06 400	105 13 400	105 14 400	105 15 400	105 23 033
BSC400-34	-	103 14 301	103 11 415 + 103 12 011							
BSC450-14	W103 03 103A	103 14 103	103 11 240 + 103 12 040	105 03 450	105 05 450	105 06 450	105 13 450	105 14 450	105 15 450	105 23 033
BSC450-34	-	103 14 301	103 11 415 + 103 12 018							
BSC500-14	W103 03 106A	103 14 105	103 11 240 + 103 12 070	105 03 500	105 05 500	105 06 500	105 13 500	105 14 500	105 15 500	105 23 033
BSC500-34*	-	103 14 304	103 11 415 + 103 12 027							
BSC560-14	-	-	103 11 240 + 103 12 105	105 03 560	105 05 560	105 06 560	105 13 560	105 14 560	105 15 560	105 23 033
BSC560-34*	-	-	103 11 415 + 103 12 040							
BSC630-14	-	-	103 11 240 + 103 12 070	105 03 630	105 05 630	105 06 630	105 13 630	105 14 630	105 15 630	105 23 033
BSC630-34*	-	-	103 11 415 + 103 12 040							
BSC450-36*	-	103 14 301	103 11 415 + 103 12 007	105 03 450	105 05 450	105 06 450	105 13 450	105 14 450	105 15 450	105 23 033
BSC500-36*	-	103 14 301	103 11 415 + 103 12 011	105 03 500	105 05 500	105 06 500	105 13 500	105 14 500	105 15 500	105 23 033
BSC560-36*	-	103 14 301	103 11 415 + 103 12 011	105 03 560	105 05 560	105 06 560	105 13 560	105 14 560	105 15 560	105 23 033
BSC630-36*	-	103 14 301	103 11 415 + 103 12 018	105 03 630	105 05 630	105 06 630	105 13 630	105 14 630	105 15 630	105 23 033
BSC710-16	W103 03 106A	103 14 105	103 11 240 + 103 12 070	105 03 710A	105 05 710	105 06 710A	105 13 710A	105 14 710A	105 15 710A	105 23 033
BSC710-36*	-	103 14 301	103 11 415 + 103 12 040							
BSC 710-38*	-	103 14 304	103 11 415 + 103 12 018	105 03 710A	105 05 710	105 60 710A	105 13 710A	105 14 710A	105 15 710A	105 23 033

AN INVERTER SPEED CONTROL KIT IS AVAILABLE FOR:

BSC 560-34 - 103 20 302 09

BSC 630-34 - 103 20 302 09

NOTE:- When speed control is required a 5-step auto transformer is recommended to ensure low noise levels.

NOTE:- All * models are supplied with 2 speed delta/star connection motors, as standard. (Sizes 450 to 630 are 4/6 Pole).

When speed control is required on all other models 5 a step auto transformer speed controller is recommended, to ensure low noise levels.

Guards: Some installations may occur where additional safety parts are needed, to ensure safety in operation. For example, the unit may be fitted at the inlet or outlet end of a ducted ventilation system, thereby exposing the impeller/motor to unguarded access. In this event, the installer must fit a safety guard complying to current regulations. These guards are available as an optional extra.

Vent-Axia

Vent-Axia

BLACK SABRE SLIM CASE SICKLE FANS
SOUND DATA

Sound Power Level Spectra dB (ref 10^{-12} Watts)

4 POLE

Dia		63	125	250	500	1k	2k	4k	8k	dBA @ 3m
BSC315/4	Inlet	77	73	66	65	63	60	56	46	47
	Outlet	77	73	66	65	63	60	56	46	47
BSC355/4	Inlet	78	73	61	64	65	63	58	50	49
	Outlet	78	73	61	64	65	63	58	50	49
BSC400/4	Inlet	79	76	70	65	68	67	56	50	52
	Outlet	79	76	70	65	68	67	56	50	52
BSC450/4	Inlet	79	78	71	68	70	68	64	55	54
	Outlet	79	78	71	68	70	68	64	55	54
* BSC500/4	Inlet	80	79	76	72	75	75	68	61	59
	Outlet	80	79	76	72	75	75	68	61	59
BSC560/4	Inlet	82	81	80	79	79	77	74	65	63
	Outlet	82	81	80	79	79	77	74	65	63
BSC630/4	Inlet	83	85	82	83	84	80	79	66	67
	Outlet	83	85	82	83	84	80	79	66	67

6 POLE

Dia		63	125	250	500	1k	2k	4k	8k	dBA @ 3m
BSC450/6	Inlet	76	69	64	63	62	55	45	47	46
	Outlet	76	69	64	63	62	55	45	47	46
BSC500/6	Inlet	79	70	69	66	65	61	52	51	48
	Outlet	79	70	69	66	65	61	52	51	48
BSC560/6	Inlet	80	71	75	73	70	66	55	57	54
	Outlet	80	71	75	73	70	66	55	57	54
BSC630/6	Inlet	81	71	80	79	73	67	56	61	58
	Outlet	81	71	80	79	73	67	56	61	58
BSC710/6	Inlet	81	72	81	80	76	69	58	63	60
	Outlet	81	72	81	80	76	69	58	63	60

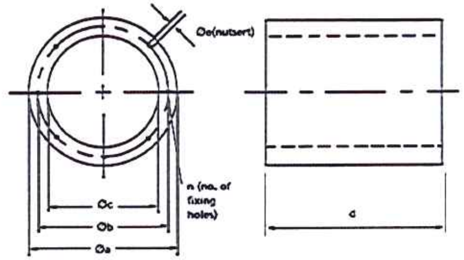
8 POLE

Dia		63	125	250	500	1k	2k	4k	8k	dBA @ 3m
BSC710/8	Inlet	75	70	70	69	68	58	53	53	50
	Outlet	75	70	70	69	68	58	53	53	50

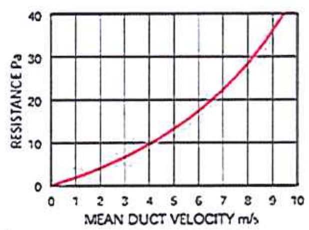
Note: The above Sound Power Level Spectra is for B-Form Running Fans.

Published dBA figures, are free field sound levels at 3m, with spherical propagation at a reference level of 2×10^{-5} Pa. The sound power level spectra figure, are dB with reference of 10^{-12} Watts.

To ensure minimum noise levels during speed control, an auto transformer speed controller is recommended.



RESISTANCE GRAPH FOR CASED ATTENUATOR FITTED WITH POD



CASED AXIAL ATTENUATOR

Stock Ref. No.	Øa	bØ	Øc	d	Øe*	n	kg approx	Fitted with pod kg approx	Free area m² without pod
105 14 315	415	355	315	475	M8	8	22	32	0.07793
105 14 355	455	395	355	540	M8	8	30	44	0.09898
105 14 400	500	450	400	600	M10	8	47	60	0.12566
105 14 450	550	500	450	675	M10	8	50	73	0.15904
105 14 500	600	560	500	750	M10	12	59	87	0.19635
105 14 560	660	620	560	840	M10	12	70	102	0.24630
105 14 630	730	690	630	940	M10	12	82	120	0.31172
105 14 710A	814	770	710	1070	M10	16	100	132	0.39567

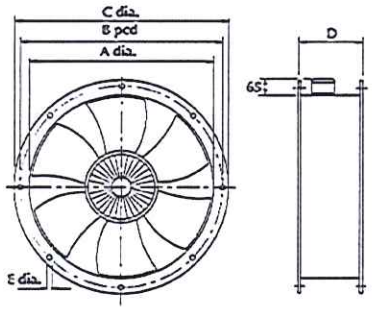
*Threaded hole to take bolt

For Insertion Losses see page 49.

BLACK SABRE SLIM CASE SICKLE FANS (BSC)

VENT-AXIA
BLACK SABRE SLIM CASE SICKLE FANS
DIMENSIONS (mm)

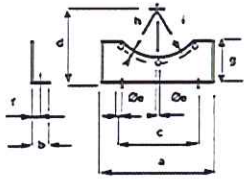
DIMENSIONS (mm)



Stock Ref. No.	ØA	ØB	ØC	D	ØE	No. Holes	Weight kg
BSC 315	315	355	386	170	10	8	10.5
BSC 355	355	395	426	170	10	8	13
BSC 400	400	450	487	170	12	8	15.5
BSC 450	450	500	537	180	12	8	20.5
BSC 500	500	560	595	180	12	12	33
BSC 560	560	620	655	240	12	12	31
BSC 630	630	690	725	240	12	12	38
BSC 710/4	710	770	806	350	12	16	65
BSC 710/6	710	770	806	240	12	16	65

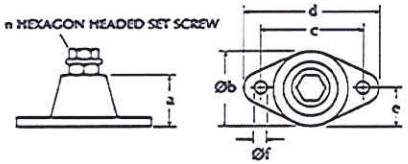
Please note: *Dimension D is 240mm on 6-pole & 350mm on 4-pole version.

ACCESSORY DIMENSIONS (mm)



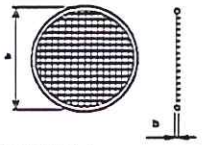
MOUNTING FEET

Stock Ref. No.	a	b	c	d	Øe	f	g	h	i
105 03 315	275	24	224	224	10	14	115	177.5	167
105 03 355	303	24	250	250	10	14	125	197.5	187
105 03 400	348	24	280	280	12	14	135	225	213
105 03 450	384	24	315	315	12	14	155	250	238
105 03 500	425	24	315	315	12	14	135	280	268
105 03 560	475	24	355	355	12	14	155	310	298
105 03 630	520	24	400	400	12	14	175	345	333
105 03 710A	710	40	610	435	13	18	240	385	365



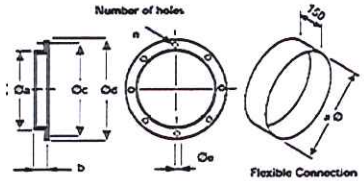
ANTI-VIBRATION MOUNTS

Stock Ref. No.	a	Øb	c	d	e	Øf	n	Max load kg
105 23 033	27	37	54	67	18.5	7	M8	23
105 23 055	27	37	54	67	18.5	7	M8	36
105 23 133	35	57	76	95	28.5	10.5	M12	91



INLET WIRE GUARD
'K' factor loss 0.25

Stock Ref. No.	Øa	b
105 05 315	380	3
105 05 355	420	3
105 05 400	475	3
105 05 450	525	3
105 05 500	595	3
105 05 560	655	3
105 05 630	725	3
105 05 710	784	5

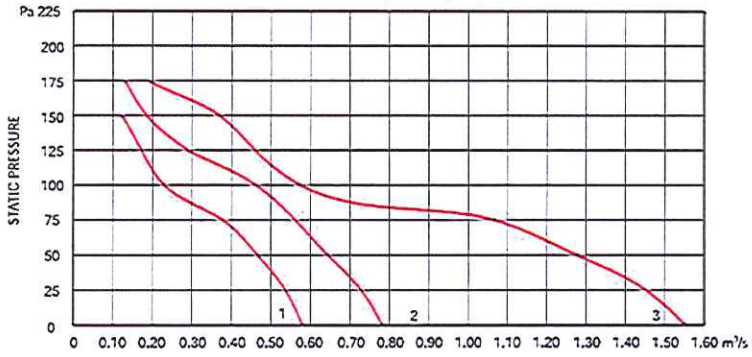


COUPLING FLANGE

Stock Ref. No.	Øa	b	Øc	Ød	Øe	n
105 06 315	386	30	355	315	10	8
105 06 355	426	45	395	355	10	8
105 06 400	487	45	450	400	12	8
105 06 450	537	60	500	450	12	8
105 06 500	595	60	560	500	12	8
105 06 560	655	75	620	560	12	12
105 06 630	725	75	690	630	12	12
105 06 710A	800	40	770	710	12	16

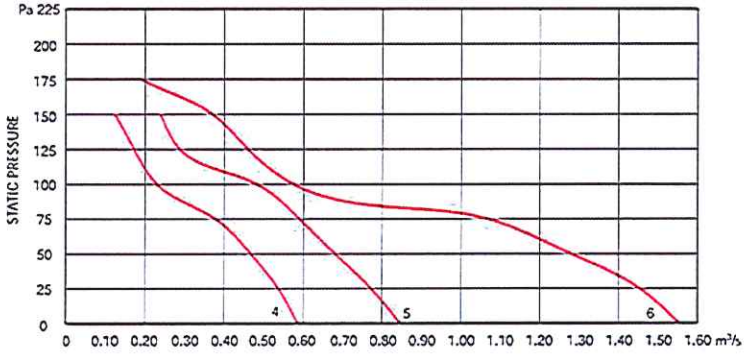
BLACK SABRE SLIM CASE SICKLE FANS
PERFORMANCE CURVES

315 to 400 dia, 4 pole, 1 phase units



Size	315	355	400
	1	2	3

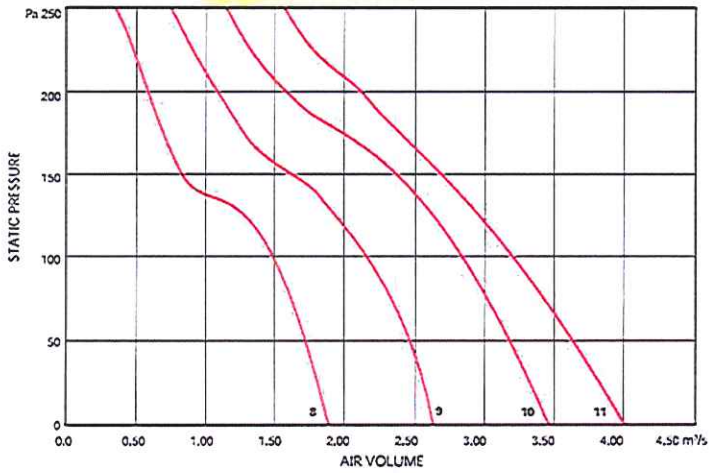
315 to 400 dia, 4 pole, 3 phase units



Size	315	355	400
	4	5	6

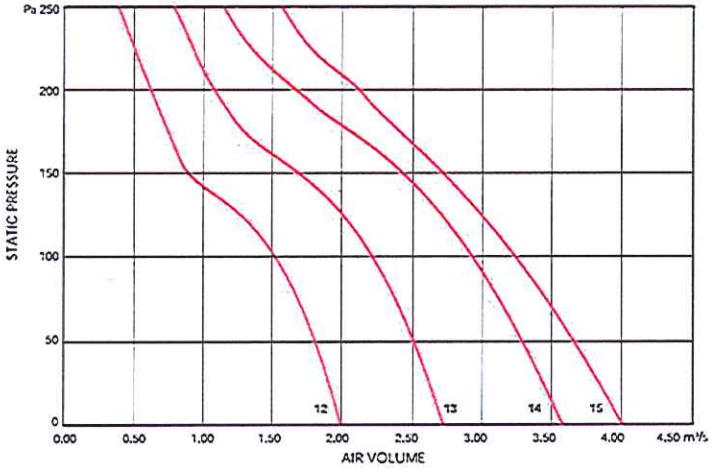
VENT-AXIA
BLACK SABRE SLIM CASE SICKLE FANS
PERFORMANCE CURVES

450 to 630 dia, 4 pole, 1 phase units



Size	450/1ph	500/1ph	560/1ph	630/1ph
	8	9	10	11

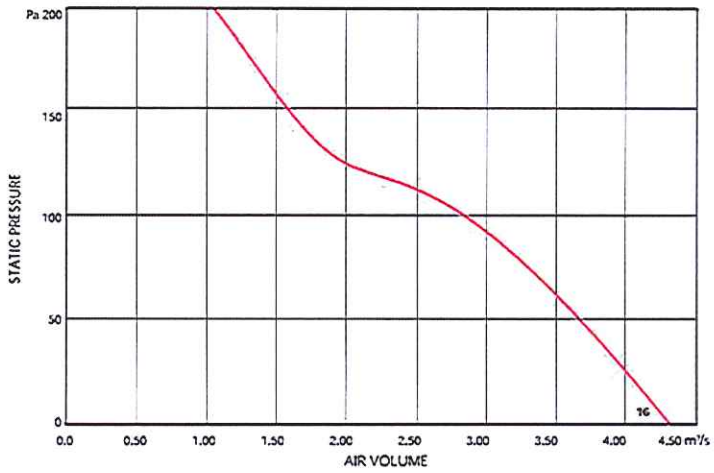
450 to 630 dia, 4 pole, 3 phase units



Size	450/3ph	500/3ph	560/3ph	630/3ph
	12	13	14	15

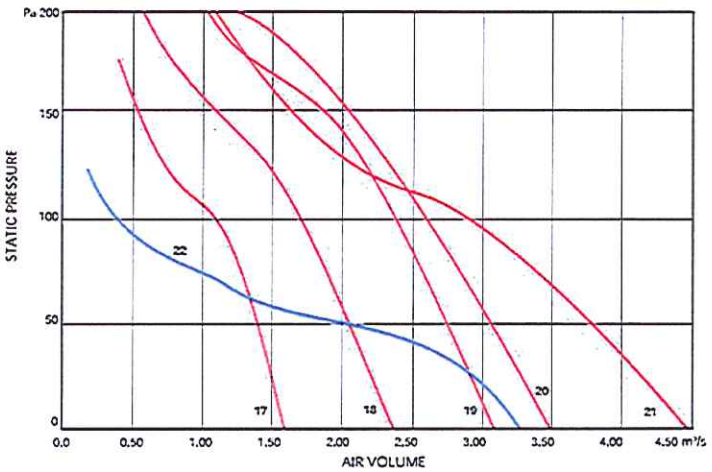
BLACK SABRE SLIM CASE SICKLE FANS
PERFORMANCE CURVES

710 dia, 6 pole, 1 phase units



Size	710/1ph
	16

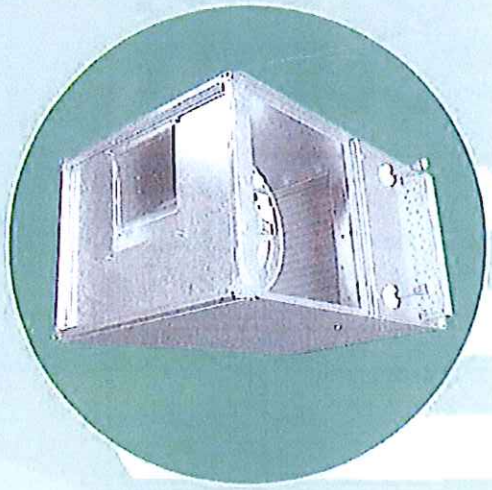
450 to 710 dia, 6 pole 3 phase & 710 dia 8 pole 3 phase units



Size	450/3ph	500/3ph	560/3ph	630/3ph	710/6 Pole/3ph	710/8 Pole/3ph
	17	18	19	20	21	22

AIR VENT
TECHNOLOGY

QUALITY RANGE | WATER HEATED AIR HANDLING UNITS



- Internal and external versions available
- Thermal protection on motor
- All models fully speed controllable
- Integral mounting points for quick and simple installation

SOUND LEVELS

Sound Levels: Induct sound levels dB ref 10^{-12}W PWL

All sound data measured at full speed

Model	SPL *dBA	Centre Frequency (Hz) 63	125	250	500	1K	2K	4K	8K
1	44	61	70	70	59	62	54	51	47
2	47	65	73	68	67	67	62	59	52
3	51	76	79	73	73	73	67	65	67
4	49	71	73	66	71	71	69	66	62
5	54	77	79	73	74	77	77	74	69
6	52	75	77	71	73	75	74	71	67
7	52	78	80	72	74	74	73	72	66

* At 1 metre from side of casing

CONTROL PANELS

Designed with quick and easy installation in mind, external wiring is kept to a minimum.

A Mains supply is taken to the panel door interlocked isolator and then outputs are taken to the fan, heater and safety circuits.

A duct sensor is supplied (or room if required) pre-wired to the panel with 10m of cable.

Switches on the front of the panel allow control of the fan and heater. All outputs to the fan are protected via an MCB.

The whole panel can be controlled via a fire alarm contact or a seven day time clock to turn off and on in a controlled manner.