KRS STEEL SERVICES
0121 783 7404

Kitchen Canopies - All Stainless Steel Works
Ductwork & Steel Fabrication - Mechanical Installations
Air-conditioning - Electrical Services
Project Management & Design

Design and Specification
For
Extraction Ventilation System

Client: Dixy Chicken

Property: 67 High Street
Alfreton
Derby
DE55 7DP

Ref:

Date: 23rd May 2023

Unit 6 Meadway Trading Estate, 429 The Meadway,
Kitts Green, Birmingham B33 0DZ
Email: **k.sharred@krssteelservices.com**

Contents

1. **Specification……**
2. **Drawings by others ……**
3. **Fan Details……**
4. **Ducting Details……**
5. **Noise Control Details……**
6. **Baffle Filter Details…….**
7. **Pre Filter Details…….**
8. **Odour Control Details…….**
9. **Anti Vibration Details……..**
10. **KRS Ltd – Cleaning and Maintenance Details……**

KRS STEEL SERVICES LIMITED

SPECIFICATION ON EXTRACTION SYSTEM: Date: 23rd May 2023
SITE REF:

ENQUIRY REFERENCE:

1. **Canopy Hood Details**

Dimensions of hood: 4600 x 1500 x 400 / 600

The canopy will be manufactured from stainless steel grade 304, with a 400mm front and 600mm back design, riveted construction with welded corners. Incorporated within the canopy would be a full length purpose built filter housing to accommodate 9 of, 500mm (wide) x 500mm (high) x 50mm (deep), high efficiency stainless steel baffle type grease filters, that will reduce grease within the system up to 94.6%. Canopy to house 4 no bulkhead lights or insert lights with grease drip trays on each end of the extraction hood.

Face velocity hood design = 6.90m2
Volume = 3.52m3/sec

Total number of grease filters 9/Dimensions 495*495*45 Design Volume 3.52m3/s/9 = 0.39m3/s

9 of stainless steel baffle filters

Ductwork and Discharge Efflux Velocity for Hood

The ductwork will have 2 no spigots off the top of the 4.6mtr hood, the extract duct will then continue up to the plant section which will run horizontally against the kitchen ceiling internal of the building before going up to the vertical discharge flue above eves which will appear external of the building.

The extract hood will have a clearance of 2mtr to the front underside, the will plant section consists of a carbon filtration unit before the 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 fan will be speed controlled via auto-transformer regulator which will help prevent harmonic sounds which cause fan to make when operated by electronic controllers, the plant will have accessible points for service and maintenance.

The vertical discharge flue will be of a high velocity discharge cowl which will be set 1mtr above the eves. The high velocity cowl is ideal for good dispersion of fumes.

The ductwork size is approximately 600*600 or equivalent and at the discharge point will be a 500 dia .6 x .6 = 0.36ml (air across duct section)
3.52m3/s/0.36 = 9.77m/second (airspeed in duct)
The 600 x 600 ductwork galvanised mild steel sheet of a folded lock formed and flange construction in accordance with DW144 specification.

The efflux velocity is **17.92m/second** and the duct work will be free from grease disperse all fumes to high level.

(3.52m3/s/0.1964m3 (free area inside 500 dia duct or equivalent)= **17.92m/s velocity**

Pressure lost in system

28 off, Linear Metres Duct @ 2.5	=	70pa
9 off, Stainless Baffle Filters	=	100pa
1 off, High Efficiency Cowl and Bends	=	120pa
1 off, Carbon Unit and Pre Filter	=	125pa
Total	**=**	**415pa clean / 450 pa dirty**

Required duty and pressure: 3.52m3/s@415pa

Extractor Fan Specification

Located within the ductwork is a SLC500/2-3B Extractor Fan, 2 pole, 3 phase and speed control via Transformer / Inverter regulator.

This fan runs at 2935rpms with a maximum operating noise of 71 dBA and will handle air flow rate in excess of 4.017m3/sec@540pa.

Kitchen Fresh Air-Inlet Details and Calculations

Design Volume: 3.52m3/s (Canopy hood design volume) x 3600 = 12,672m3/hr

Kitchen area 5.3m x 13.5m x 3.9m = £279.05m3 recommended air change rate for commercial kitchen is 60 ach.

The air change rate equates to 12,672m3/hr divided by the kitchen volume 279.05m3. This gives us an air change rate of I 40.22ach. 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 3.52m3/s (12,672m3/hr) x 85% requires 2.99m3/s (10,764m3/hr)

Pressure Lost in Air-Supply System

Allowing for 45 pa filter / (600*600 duct = 8.3lm/s velocity) 100 pa duct / 120 pa grille/bends 30 / = 29Spa clean / 350 pa dirty

Air – Supply Fan and Grill Specification

Fan selected: SLC500/2-3A Axial Fan, 2 pole, three phase, speed regulated via Inverter Drive.
This fan runs at 2850 rpms with a maximum operating noise of 78dBA and will handle air flow rate in excess of 3.60lm3/sec @ 428pa.

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2. Drawings

Standard proposed extraction system external.
See attached drawing 1.

3. Fan Details

Extraction Fan System

- 500-1 Max Fan /20/4/6/30/18
- TEDS 13A Controller

Fresh Air Fan System

- 450.JM/16/4/5/30
- ME 1.3 Controller

HIGH PRESSURE CASED AXIALS - MAXFAN²

FEATURES

- 400 - 630 mm diameter
- Volume up to 7.28 m³/s
- Static pressures up to 1082 Pa
- Fans tested to ISO5801 and BS848
- High energy efficiency
- Low installed noise levels
- Motor protection IP55
- Overheat protection fitted as standard

ELECTRICAL SUPPLY

220-240V/50Hz/1ϕ
380-420V/50Hz/3ϕ

TEMPERATURE RANGE

-40°C to 50°C as standard.
BT or CT motors can be continuously operated at temperatures up to 70°C.

SIZES

400, 450, 500, 560 and 630 mm.

IMPELLERS

A unique high efficiency aerofoil section blade with a smoothed hub and clamp plate for adjustable pitch angle availability.

The Fläkt Woods impellers are all high pressure die cast to offer thin aerofoil sections for low generation of noise. Every cast aluminium component is X-ray examined using Real Time Radiography prior to assembly.

MOTORS

All motors are totally enclosed air stream rated class F insulation. Constructed from aluminium as standard with special 'T' slot or pad mounted fixings. Motors are suitable for speed control.

Suitable for horizontal through to vertical shaft operation. Supplied IP55, with removable drain plugs.

Sealed for life bearings lubricated with wide temperature range grease. Motors are fitted with overheat

protection which is provided by a thermostat or thermistor as standard (depending on motor).

CASINGS

MaXfan² are available fully cased, complete with an externally mounted pre-wired electrical terminal box. Casings are spun from sheet steel with integral pre-drilled and radiused inlet flanges. The galvanised finish gives a high resistance to corrosion and is ideal for external as well as internal use.



PRODUCT CODE

50-1 MaXfan²

- 50 - denotes the fan impeller diameter in centimetres
- 1 - denotes electrical phase
- MaXfan² product type

ACCESSORIES (Pages 77-82) - **CONTROLLERS** (Pages 219-267)



Specifications are subject to alteration without notice

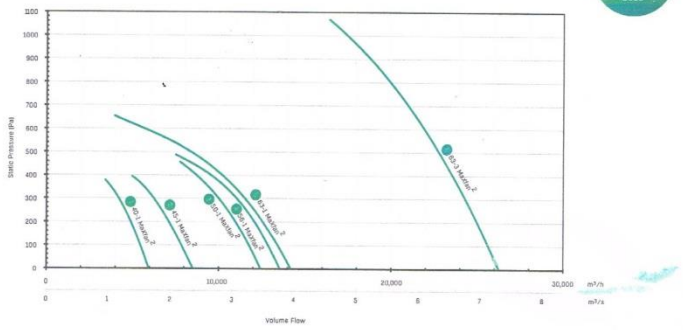
Woods
A Flakt Woods Brand

MAXFAN² PRODUCT PERFORMANCE & ELECTRICAL DATA

220-240V/50HZ/1ϕ & 380-420/50HZ/3ϕ – L TYPE

ErP COMPLIANT 2015

PERFORMANCE CHART



PERFORMANCE TABLE

Ref	Product Code	m³/s @ Pa (Static) 0	50	100	150	200	250	300	400	500	600	700	800	900	1000
1	40-1 MaXfan2/18/4/5/37/30	1.64	1.58	1.51	1.43	1.35	1.26	1.16							
2	45-1 MaXfan2/18/4/5/37/30	2.36	2.27	2.17	2.07	1.97	1.85	1.72							
3	50-1 MaXfan2/18/4/5/42/36	3.45	3.36	3.26	3.16	3.04	2.92	2.77	2.41						
4	56-1 MaXfan2/25/4/6/30/26	3.76	3.67	3.57	3.47	3.35	3.22	3.08	2.65						
5	63-1 MaXfan2/18/4/5/19/18	3.83	3.83	3.72	3.61	3.48	3.35	3.19	2.83	2.33	1.57				
6	*63-3 MaXfan2/25/4/9/40/32	7.28	7.18	7.05	6.95	6.87	6.78	6.67	6.48	6.27	6.01	5.76	5.49	5.2	4.81

PRODUCT AND ELECTRICAL TABLE

Ref	Product Code	Product Number	Pitch Angle (°) Min	Max	Speed rev/min	Phase	Motor	Rating (kW) Per Stage	Rating (kW) (Total)	Full Load Current (A) (Total)	Starting Current (A) (Total)	Wiring Diagram	Speed Controller Electronic	Transformer	Inverter	Sound Levels
1	40-1 MaXfan2/18/4/5/37/30	EQ411463	37	303	1420	1	ST9 (EE1)	0.32	0.64	4.4	10.0	CD3027	ME1.6	TED5 5A	N/A	64
2	45-1 MaXfan2/18/4/5/37/30	EQ461477	37	30	1380	1	CT5 (EE1)	0.52	1.04	7.8	15.6	CD3027	ME1.6	TED5 5A	N/A	68
3	50-1 MaXfan2/18/4/5/42/36	EQ511467	42	36	1380	1	CT9 (EE1)	0.97	1.94	13.8	27	CD3037	ME1.12	TED5 13A	N/A	75
4	56-1 MaXfan2/20/4/8/30/26	EQ571480	30	26	1380	1	CT9 (EE1)	0.97	1.94	13.8	27	CD3037	ME1.12/18	TED5 13A	N/A	78
5	63-1 MaXfan2/18/4/5/19/18	EQ641406	19	18	1350	1	CT9 (EE1)	0.97	1.94	13.8	27	CD3037	ME1.12/18	TED5 13A	N/A	78
6	*63-3 MaXfan2/25/4/9/40/32	EE681478	40	32	1440	3	I12 (EE2)	4.8	9.6	19.4	98.8	ENQ	N/A	N/A	IDDXF54 23	79

For ErP efficiency ratings and grades please refer to our Fan Selector for more information. For speed controllers please see pages 219-267.

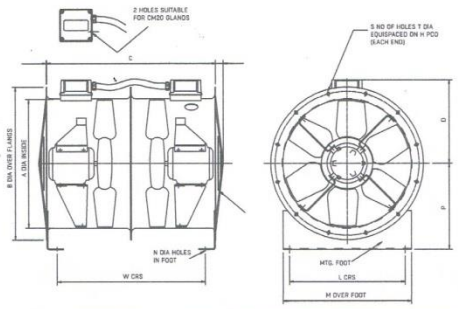
Sound pressure levels quoted are at the inlet, and are average dBA at 3m distance over a sphere at the mid point at the highest angle given, under free field conditions. These are presented for comparative purposes only. *3 phase only.

Products in **bold** are available from our UK Distributors on next day delivery, if ordered by 4pm. Please call to confirm availability on 01206 222 555.

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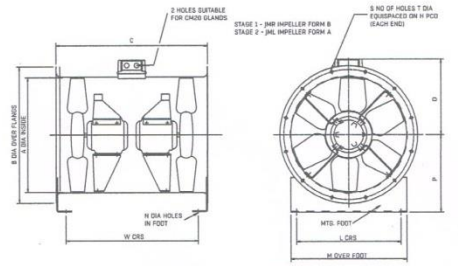
DRAWINGS

MAXFAN² 40-1, 45-1 AND 63-3



Product Code	Motor	A	B	C	D	E	H	L	M	N	P	S	T	V	W	Weight (kg)
40-1 MaxFan²	BT9	400	480	680	279	2.5	450	350	400	10	250	8	12	30	660	44
45-1 MaxFan²	CT5	450	530	820	306	2.5	500	400	450	10	280	8	12	30	571	44
63-3 MaxFan²	112	630	724	1040	403	3	890	580	630	10	400	12	12	50	954	155

MAXFAN² 50-1, 56-1 AND 63-1



Product Code	Motor	A	B	C	D	H	L	M	N	P	S	T	W	Weight (kg)
50-1 MaxFan²	CT8 (IE1)	500	584	710	338	560	450	500	10	315	12	12	620	57
56-1 MaxFan²	CT8 (IE1)	560	654	680	368	620	510	560	10	355	12	12	590	61
63-1 MaxFan²	CT8 (IE1)	630	724	710	403	680	580	630	10	400	12	12	624	71

All dimensions in mm.

Specifications are subject to alteration without notice

CASED AXIALS - JM AEROFOIL

FEATURES

- 315 - 1000 mm diameter
- Air flow up to 20.9 m^3/s
- Static pressures up to 1100 Pa
- Fans tested to ISO5801 and BS848
- High energy efficiency
- Low installed noise levels
- Motor protection IP55
- Larger sizes available please enquire for more information

ELECTRICAL SUPPLY

220-240V/50Hz/1ϕ

380-420V/50Hz/3ϕ

TEMPERATURE RANGE

200°C for 2 hours with 3 ph motors on one off emergency operation only.
-40°C to 50°C as standard.
50°C to 70°C must be run at full speed only.

SIZES

315, 355, 400, 450, 500, 560, 630, 710, 800, 900 and 1000 mm.

IMPELLERS

A unique high efficiency aerofoil section blade with a smoothed hub and clamp plate for adjustable pitch angle availability.

The Fläkt Woods impellers are all high pressure die cast to offer thin aerofoil sections for low generation of noise. Every cast aluminium component is X-ray examined using Real Time Radiography inspection prior to assembly. The maximum pitch angles shown allow for speed control by frequency inverter (3ph only).

MOTORS

All motors are totally enclosed air stream rated class F insulation. Constructed from aluminium or cast iron as standard with special 'T' slot, or pad mounted fixings. Single speed motors are suitable for speed control by voltage regulation where indicated. Three phase motors are suitable for use with frequency inverters, suitable for turn down to 20% of maximum speed. Two speed motors are available on request. Suitable for horizontal or vertical shaft operation. Supplied IP55, with removable drain plugs.

Sealed for life bearings lubricated with wide temperature range grease. The BT and CT frames are fitted with overheat protection thermostat as standard. 80-160 frame motors are fitted with Thermistor OHP. These motors are suitable for inverter\speed control down to 20% of full speed and where within scope incorporate IE2 compliant motors.



CASINGS

JM Aerofoil fans are available in either a long cased form, complete with an externally mounted pre-wired electrical terminal box, or short cased for duct or plate installation. Casings are spun from sheet steel with integral pre-drilled and radiused inlet flanges. The galvanised finish gives a high resistance to corrosion and is ideal for external as well as internal use.

PRODUCT CODE

63JM/20/4/6/36

- 63 - denotes the fan impeller diameter in centimetres
- JM - denotes fan type
- 20 - denotes impeller hub diameter in centimetres
- 4 - denotes a nominal 4 pole speed
- 6 - denotes the number of blades
- 36 - denotes the pitch angle for the required duty

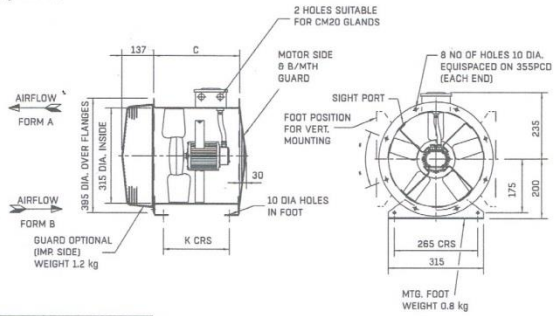
ACCESSORIES (Pages 77-82) - **CONTROLLERS** (Pages 219-267)



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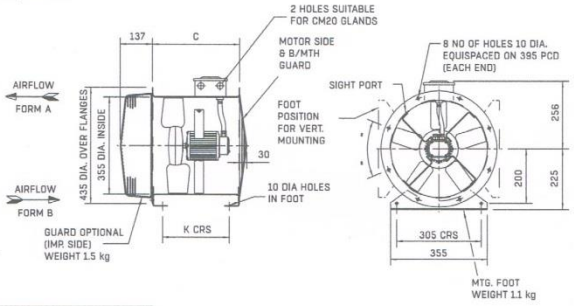
DRAWINGS - 315-355 MM

315 MM (EJ321460)



Size	Motor Frame	C	K	Weight kg Fan
315	BT5	330	245	21

355 MM (EJ361460)



Size	Motor Frame	C	K	Weight kg Fan
355	BT5	330	245	22

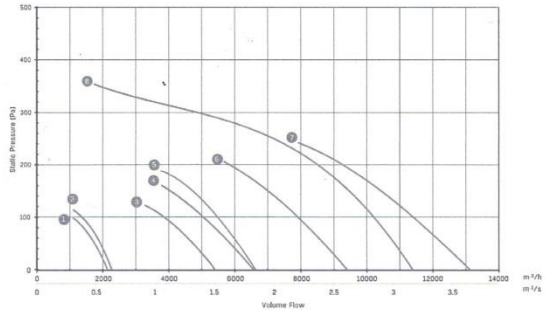
All dimensions in mm.

Specifications are subject to alteration without notice

JM AEROFOIL PERFORMANCE AND ELECTRICAL DATA

220-240V/50HZ/1ϕ - L TYPE

PERFORMANCE CHART - 315-630MM



PERFORMANCE TABLE - 315-630MM

Ref	Ref	m³/s @ Pa (Static)						
		0	50	100	150	200	250	300
1	31JM/16/4/S/34	0.59	0.48					
2	35JM/16/4/S/22	0.63	0.53	0.37				
3	40JM/16/4/S/40	1.5	1.31	1.07				
4	45JM/16/4/S/30	1.92	1.62	1.4	1.12			
5	50JM/20/4/E/20	1.84	1.68	1.52	1.3			
6	50JM/20/4/E/32	2.61	2.41	2.18	1.94	1.62		
7	56JM/20/4/E/30	3.64	3.41	3.16	2.88	2.57		
8	63JM/20/4/E/18	3.17	3.01	2.82	2.61	2.38	1.98	1.33

PRODUCT AND ELECTRICAL DETAILS - 315-630MM

Ref	Product Code	Product Number	Pitch Angle (°)		Speed rev/min	Motor	Rating (kW)	Full Load Current (A)	Starting Current (A)	Wiring Diagram (CD)	Speed Controller	
			Min	Max							Electronic	Transformer
1	31JM/16/4/S/34	EJ321460	28	34	1420	BTS	0.075	0.5	1.45	CD3038	ME1.1	TEID 1
2	35JM/16/4/S/22	EJ361460	18	22	1420	BTS	0.075	0.5	1.45	CD3038	ME1.1	TEID 1
3	40JM/16/4/S/40	EJ411452	34	40	1420	BT9	0.25	1.8	3.45	CD3038	ME1.3	TEID 2.2
4	45JM/16/4/S/30	EJ461468	24	30	1420	BT9	0.32	2.2	5	CD3038	ME1.3	TEID 2.2
5	50JM/20/4/E/20	DX511455	16	20	1420	BT9	0.32	2.2	5	CD3038	ME1.3	TEID 2.2
6	50JM/20/4/E/32	EJ511468	32	32	1420	CT8	0.88	4.8	11	CD3038	ME1.8	TEID 5
7	56JM/20/4/E/30	DX571459	26	30	1420	CT9	0.87	6.9	13.5	CD3037	ME1.6	TEID 7.5A
8	63JM/20/4/E/18	DX641453	14	16	1420	CT9	0.87	6.9	13.5	CD3037	ME1.6	TEID 7.5A

For ErP efficiency ratings and grades please refer to our Fan Selector for more information. For speed controllers please see pages 219-267.

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Specifications are subject to alteration without notice

4. Ducting Details



The Ductwork is manufactured from galvanised mild steel sheet, folded and lock formed with flanged construction in accordance with D.W.144 specification or can be spiral round ductwork.

5. Noise Control

Regarding our advice for the kitchen extract system we have assumed an evening ambient noise level of 45dBA L90 up to 23.00 hours outside the nearest windows on the building, at approximately 3 to 4 m distance from the extract discharge at roof level. Given the location and the type of ventilation system required a realistic design criterion would be approximately 5dB below the background noise level outside the nearest possible noise sensitive windows.

We have selected a silencer for the extract discharge system; the silencer would be rectangular design without a pod, typically 500mm x 500mm long. The silencer should reduce the radiated discharge noise to 40dBA @ 4m distance.

We advise fitting a silencer to the sides of the extract fan to reduce noise within the kitchen area. The silencers advised are a design 500mm x 500 x 500mm long. The extract fan is located within the riser which effectively controls break out noise that could be radiated externally. In addition the fan and ductwork system should be supported off the building structure using anti-vibration mounts/hangers to avoid vibration transmission into the building structure.

Flanged Square Silencers Specification

Silencers are available in two standard lengths –

- 1D (length = Diameter)
- 2D (length = 2 x Diameter)

Each length is then available with and without cylindrical centre-body or 'pod' which provides additional attenuation. These are identified by the inclusion is the product code 'P' for podded of 'NP' for unpodded versions.

When selecting the appropriate silencer, account needs to be taken of both the level of sound reduction achieved and, in the case of a podded silencer, the additional pressure drop in the system which needs to be overcome by the fan.

For sound, deducting the appropriate 'dBA Attenuation' figure from the dBA @ 3m' figure in the relevant fan performance table gives a combined dBA @ 3m figure for the fan and silencer combination.

For pressure, the '^P' figure should be added to the pre-attenuation pressure requirement before selecting the appropriate fan.

Quiet-Duct® Silencer Type: ES

With Forward and Reverse Flow Ratings



For many years, the IAC S silencer has been the industry standard for maximum noise reduction with minimum silencer length. The type ES (Energy Saver) silencer provides the same high level of acoustic performance combined with a marked decrease in energy consumption.

Supplied as Standard

- Aerodynamic inlet and discharge to splitter elements to reduce pressure drop and conserve energy
- Perforated galvanised steel facings to all splitter elements to protect acoustic media from damage and erosion

Designating Silencers: Example

Model: 5ES-600-600

Length	Type	Width	Height
1500mm	ES	600mm	600mm

Weight

Average weight 100kg/m³

Self-Noise Power Levels dB re: 10^{-12} Watts

IAC ES Model	Octave Band	1	2	3	4	5	6	7	8
	Hz	63	125	250	500	1K	2K	4K	8K
	Silencer Face Velocity, m/s								
ES All Lengths	-15	56	54	58	60	61	65	69	64
	-10	47	47	52	55	57	63	64	54
	-5	41	41	45	47	52	60	48	38
	+5	42	35	33	32	34	33	27	22
	+10	50	47	44	41	43	45	43	41
	+15	60	57	54	50	49	53	53	50

Aerodynamic Performance

IAC Model	Length (mm)	Static Pressure Drop N/m²							
ES	900	2	5	10	15	20	27	35	45
	1500	2	5	10	15	22	30	37	47
	2100	2	7	12	20	30	42	55	70
	3000	5	10	17	27	40	55	70	90
Silencer Face Velocity, m/s		1.02	1.52	2.03	2.54	3.05	3.56	4.06	4.57

Face Area Adjustment Factors (add or subtract from Lw values above)

Quiet-Duct® Face Area, m²*	0.05	0.09	0.19	0.37	0.76	1.5	3.0	6.0	12.0
Lw Adjustment Factor, dB	-9	-6	-3	0	+3	+6	+9	+12	+15

* For intermediate face areas, interpolate to the nearest whole number

6. Baffle Filter Details



It is universally recognised that there is an increasing need to maintain and improve hygiene standards & reduce fire hazards within kitchens. The baffle grease filter accomplishes both needs through its clever design of interlocking baffles that provide a tortuous route for the passage of air through the filter by creating two rapid 180 degree air direction changes simultaneously. The grease molecules having a far greater inertial force than air impact themselves on the vanes. A series of vertical Stainless Steel or Aluminium vanes are housed in a channel frame, with each of the baffles strategically aligned to provide the highest potential for grease removal. Due to the smooth nature of the vanes the grease naturally runs downwards, through the drainage holes and into the collecting trays normally provided within the canopy holding casings.

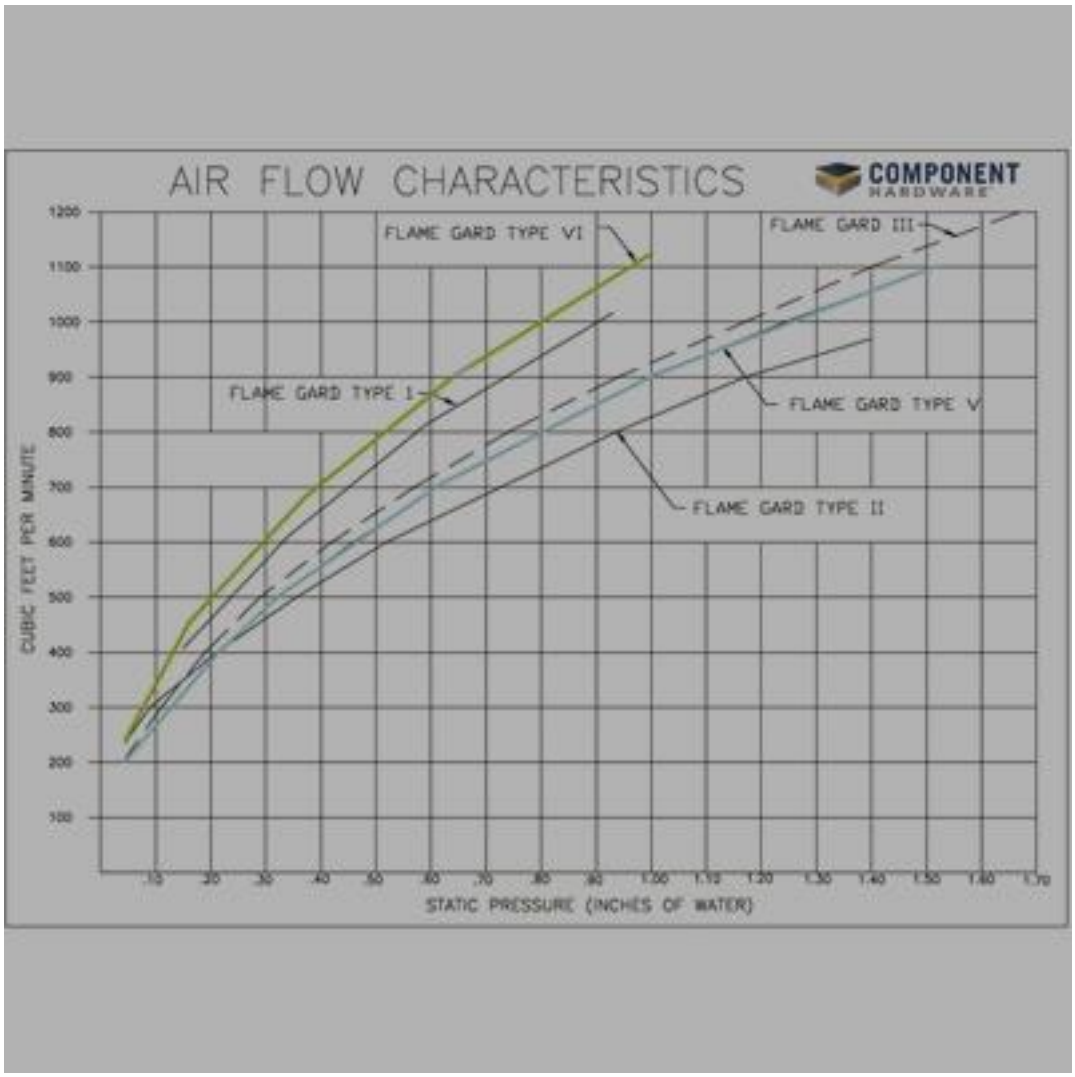
Construction
The WFG baffle filter range is available in Aluminium or Stainless Steel and is robustly constructed with filter removal handles fitted as standard.

Cleaning
It is imperative that this product is regularly cleaned – according to use. This may be accomplished by steam cleaning, washing in a dishwasher using conventional detergents or cleaners.

Range
Baffle filters are available in a large range of standard sizes, they can also be manufactured in no-standard sizes, however the filter depth is always limited to 47mm due to the nature of the filter.

Normal Size H x W x D	Actual Size H x W x D	Rated Capacity*	Resistance
10 x 20 x 2”	241 x 495 x 45mm	500m 3/hr	120pa
16 x 20 x 2”	395 x 495 x 45mm	830m 3/hr	124pa
20 x 20 x 2”	495 x 495 x 45mm	1000m 3/hr	104pa

***Note** Baffle filters may be used at higher rated capacities whilst retaining their efficiency, however it should be noted that this will increase their resistance to air. Baffle filters must always be used with the baffles running vertically.



7. Pre filter Details



WFV Pleated Disposable Panel

With the increased demands of advancing technology the WFV Disposable Filter provides a high level of protection at a low replacement cost. The product is suitable for use in general filtration applications or as the first line of protection for a more elaborate filtration system. Being fully incinerable the product is particularly suited for application where this form of disposal of the spent filter is anticipated.

Construction

The WFV Disposable Filter contains a core of pleated non-hygroscopic and hydrophobic fibrous media designed specifically for use in air filtration. The media is manufactured with a graded fibre density to ensure optimum and even dust retention combined with low initial resistance and is thermally bonded onto a galvanised steel support mesh for maximum physical stability. The aerodynamic pack is then fully bonded into a moisture resistant rigid white lined card frame and fitted with an airflow indicator.

Applications

The WFV Disposable panel is suitable for use as a pre filter for higher grades of air filtration or for use as a simple filter for general use within air handling systems where the use of glass fibre is unacceptable.

Range

The WFV is available in a large range of standard sizes in 25,50 and 100mm nominal depths (23,47 & 97mm actual) and may also be produced in non-standard sizes to suit application requirements. The key attributes of the product are consistent efficiency, robust construction and long life combined with low replacement cost.

8. Odour Control Details

Before the fan, will be a purpose built carbon filtration discarb unit and will house a pre filter (to prolong the life of the activated carbon cells) and hold approximately 6 carbon bonded panel cells.

For 0.3 seconds contact time – typically recommended for spicy cuisine such as Thai / Indian / Grill & Steakhouse. (1 single carbon panel @ 594 x 594 x 25mm framed will achieve a 0.3 second contact time at 0.029m3/s)

Design Air Flow Rate 3.52m3/s/0.029m3/s = 121.37

Therefore a minimum of 6 extra duty carbon cells panels must be used.

By rounding the number of carbon filters up from the calculations, it allows some room for any inefficiency in the odour control.

Odour Control Details

WF Bonded Copper Impregnated Carbon Cell Panel – Specification
Carbon filtration is ideal for removing unpleasant or even dangerous odours and gases from a wide variety of sources.

The ever increasing awareness of this problem from public health authorities and environmentalists has resulted in an increase in the use of the unique properties of activated carbon filtration.

Carbon will absorb chemical molecules in the airstream in varying degrees according to the type of contaminant and the period of times the air remains resident in the carbon. Typical applications for carbon include: incoming air in industrial plants, airports, art galleries etc. or outgoing air in kitchens, industrial processes, sewage plants etc.

Application
Activated carbon in its loose granular form can present problems as there is a tendency for the granules to abrade one another, this causes both settlement of the carbon – creating potential bypass voids and produces carbon dust that can be re-entrained into the air stream. The unique bonding method eradicates these problems by producing a solid and stable biscuit of consistent quality and dimensional stability that produces and even resistance.

Operational Criteria
In order to ensure a carbon filter operates satisfactory certain criteria need to be met which do not apply to particulate filters. The most important aspect is the 'dwell time' (the period of time the air is in contact with the carbon). The minimum dwell time used is 0.1 seconds, this relates to 0.19m/sec through a 25mm nominal thickness panel. The dwell time may vary considerably according to the contaminant to be removed. In order to be able to present adequate surface area to the airstream the panels will normally need to be mounted in 'V' formation within a casing or housing.

As far as possible water vapour should be eradicated from the air-stream to eliminate condensation within the filter that could cause porous blockage causing a dramatic increase in resistance-this also applies to loose carbon. However humidity levels as high as 80% RH are normally acceptable providing no interstitial condensation takes place.

Air-stream temperatures entering the filter in excess of 40 Degree Celsius should be avoided. In the case of anticipating temperatures above this level steps should be taken to reduce the temperature to an acceptable level by fresh air bleed, coiling coil or heat exchanger. In catering and food preparation applications smoke and grease must be removed from the air-stream prior to entry into the carbon.

The product is available either unframed or framed in Aluminium, Galvanised or Stainless steel channel.

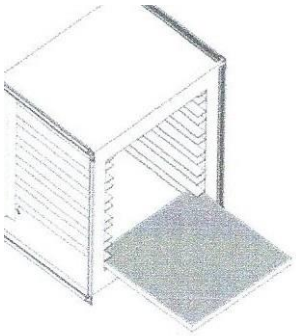
Performance
Due to the complex nature of adsorption carbon filters are generally designed to suit the application, however, the following information is given as an indication of the physical requirements for its use:

Filtration Housing

Purposed built carbon filter housing manufactured from 0.8 galvanised steels DIMS 610 x 610 x 960, lock form formed with 500 diameter spigots at both ends to stiffen the housing. Inside the housing are to be runners for pre filtration filter and suitable supports for panel with safety edges, the door is to be bolted to the unit with hand tight handles and rubber gasket to be run around panel to stop any grease from leaking. Inside the housing is to be 1 no G4 panel to remove dust particles followed by 6 no carbon bonded panels to remove the odours present.

Note: The filters must be cleaned every 3 months and replaced 12/18 months depending on the condition of the carbon bonded panel cells.

Dimensions 500 x 500 x 800
To suit 500 x 500 carbon panels



Cleaning and Maintenance

The carbon cells should be inspected for carbon testing every 3 months for results in changing; again this will be done by Installation Contractors. This will give us a result in whether the change of the carbon filters should take place every 3-6 months to maintain its optimum efficiency.

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.

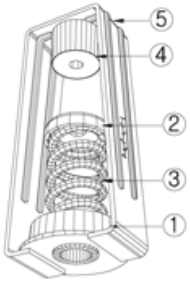
The inspection and service of the fan is required every 6 months which will have to be carried out by the installation contractors. This again will be inspected by the installers. We recommend that the canopy and the ductwork should receive a full deep clean 6 months after installations and then every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

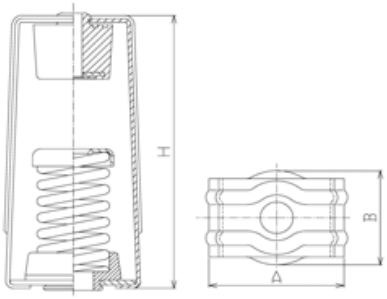
The carbon filter/pre-filters and system will be kept on a data base by the installers who will contact the user when inspection is due, the customer will have an inspection book which will be stamped after inspection and service by the installation contractors.

9. **Anti-Vibration**

Please note all fans will be mounted on the SH type anti-vibration spring hanger and all inside ceiling brackets and cantilever wall brackets. We use a rawlnut multipurpose fixing into the brickwork and use the acoustic hangers for ductwork supporting.







Features

The SH type anti-vibration spring hanger ensures that vibration generated from the equipment and/or stress by thermal expansion in the pipe and duct while the equipment is running are not transferred to the structure through pipe and duct. The housing needs to be strong enough to stand the weight of the equipment without causing resonance from its own vibration. With the coil spring having a static deflection of 25 mm, the product can maintain the system's natural frequency down to 3~5 Hz and the CR type housing fixture is mounted on top of the housing to prevent high frequency that is passed through pipe and duct from getting into the structure on top of the hanger. Plus, the CR type spring sheet is attached at the bottom to block the high frequency resulting from the vibration that the spring generates itself.

Usage

- For high-efficient vibration control of axial, in-line fan, machine room, pipes in air-conditioning room and ducts
- For high-efficient vibration control of suspended ceiling desk system in, for example, studios and acoustical laboratories

Specification

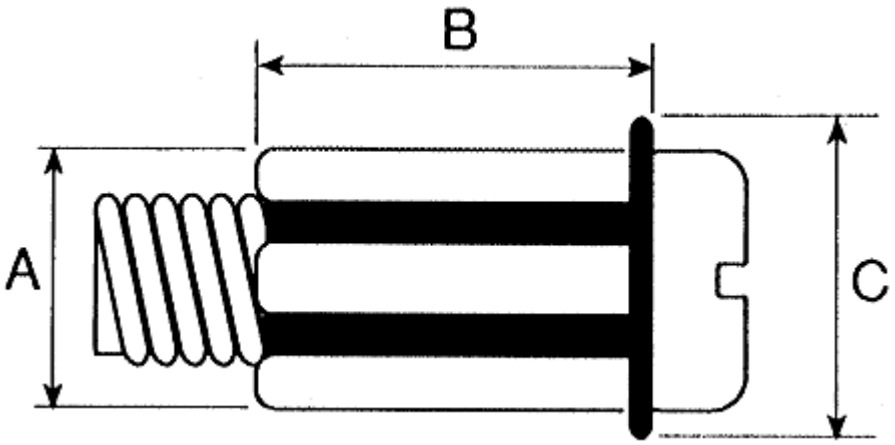
No.	Name of Components	Material	Standard
1	Spring Seat	CR	KS M 6617
2	Spring Cap	SS400	KS D 3503
3	Coil Spring	SUP9	KS B 2402
		HSW3	KS B 2403
4	Housing Fixture	CR	KS M 6617
5	Hanger Housing	SS400	KS D 3503

Product Details

Rawlnut Multipurpose Fixing

The Rawlnut multipurpose fixing consists of a rubber sleeve with a flange at one end and a bonded-in nut at the other.





Specifications

Attribute	**Value**
Thread size	M4
Type	Wall Plug
Length	12.6mm
Fixing Hole Diameter	8mm
Maximum Fixing Thickness	4mm
Material	Brass, Rubber



Acoustic Brackets

- Acoustic hanger for ducting
- Hole for M8 threaded rod

Metal bracket with rubber isolating bush typically fixed as an acoustic suspension point to the side of ducting or to timber joints.

10. **KRS Steel Services Ltd – Cleaning and Maintenance Details**

Canopy and Filter Maintenance

- Grease Filters to be cleaned daily by soaking in detergent overnight.
- Grease trap and condense channel must be cleaned daily
- Canopy and fan to have professional deep clean every 4 months to maintain warranty. If cleaning not carried out by us warranty becomes void.

Carbon Filter Maintenance

- Carbon filter must be changed every six months

Pre Filter Maintenance

- Pre Filter must be changed every six weeks

General Cleaning

- Using a damp cloth with mild detergent diluted in water wipe all stainless steel services
- Once dry using a mixture of 50% baby oil and 50% white spirits mixed together, applied to a non-abrasive cloth, lightly wipe down following grain to maintain the stainless steel.

DO NOT USE ANY ABRASIVE MATERIAL TO CLEAN OR CONCENTRATED CHEMICALS
i.e. mild steel wire wool cleaners