

EXTRACTION STATEMENT

In respect of

**EXTRACT CANOPY
65 WHITWORTH ST
MANCHESTER
M1 3NZ**

On behalf of

GPA LTD

Ref – 19/25 (ES.01)

Date – August 2025

1. INTRODUCTION

- 1.1 This statement has been produced in support of a full planning application on behalf of Grand Property Assets Ltd for a new extract canopy and associated flue at 65 Whitworth St, Manchester M13NZ.
- 1.2 The extract canopy will be located on the ground floor of the unit and the flue routed to the rear terminating in a jet cowel at the ridge. For further details on the routing etc please refer to Manchester Building Designs Ltd drawing ref 25/72-01 Rev B.
- 1.3 The fan motors and attenuation will be located horizontally within the ground floor unit, with the completed system complying with MCCs external plant noise requirements and BESA DW172.

2. EXTRACTION VENTILATION STATEMENT

- 2.1 The main elements of the extraction system will be accordance with the following and the completed system will be verified by an acoustic engineer to show compliance with MCCs requirement to achieve max external plant noise of 5dB (LAeq) below the background noise level (LA90).

3. KITCHEN CANOPY EXTRACTION REQUIREMENTS

- 3.1 The cooker canopy will be sufficiently long and wide to cover all cooking ranges and appliances. The canopy will be of sufficient height to enable easy working, on the ranges, whilst low enough to entrain all odours/steam generated by the cooking.
- 3.2 The canopy will be constructed from stainless steel to enable easy cleaning.
- 3.3 The canopy will be fitted with primary grease filters, of a re-usable wire mesh type design. There will be sufficient primary grease filters fitted to cover the complete length of the canopy face above the cooking ranges in addition there will be grease catch trays attached to the canopy at 1m centers.
- 3.4 Primary grease filters will be cleaned daily there will be second set of filters which will be rotated daily, so that one-set is always in use whilst the second set is being cleaned. The extraction system has been designed to ensure that the velocity of gases through these filters enables sufficient residence time to optimise grease removal.
- 3.5 Ventilation air inlets will be provided to the kitchen, designed to allow air ingress but located to prevent the direct release of odours out of the kitchen these will take the form of trickle vents installed above the ground floor window frames and undercutting entrance doors.

4. SECONDARY FILTRATION

- 4.1 A secondary filter will be installed in the ductwork after the grease filter and before the Carbon filter this will be a disposable pleated panel filter in the ductwork. This filter can will be incorporated in-line within the same filtration housing. The secondary filter shall be replaced every 3 months.

5. ODOUR CONTROL FILTRATION

- 5.1 Activated carbon filters will be installed after the secondary filter.
- 5.2 Activated-carbon filters absorbs gaseous odours, usually volatile organic compounds, onto the filter medium. They take the form of a panel having a 3-stage system of activated carbon frames contained within a single module, the carbon filter will have a dwell time of 0.4s (Grade 207C). It is imperative that all grease is removed by the preceding grease filtration as grease contamination will reduce the life of the filters and increasing cost.
- 5.3 Activated carbon filters shall be replaced every 3 months.
- 5.4 All secondary/final grease and activated carbon filtration will be located at a sufficient distance along the duct run, to prevent the heat from the cooking reducing the efficiency of the filtration.
- 5.5 The filter housing has been designed to ensure ease of access for maintenance which would also be fully sealed. The internal surfaces of the filter housing shall be cleaned monthly.
- 5.6 The gas flow rates, through the filters, shall be matched to the respective retention time of each filter to achieve optimum efficiency of the filters. It is critical to achieve optimum efficiency to effectively remove grease and odour and to prevent breakthrough of grease and odour, by too great a flow.

6. EXTRACTION MOTOR / FAN

- 6.1 The extraction fan shall be mounted on Anti – Vibration component and the extraction motor will be cleaned and maintained in accordance with the manufactures specifications. The motor controller shall be located in the kitchen and be of variable speed design, adjusted so that the speed settings correlate to and achieve the optimum flow rates of the odour control system.

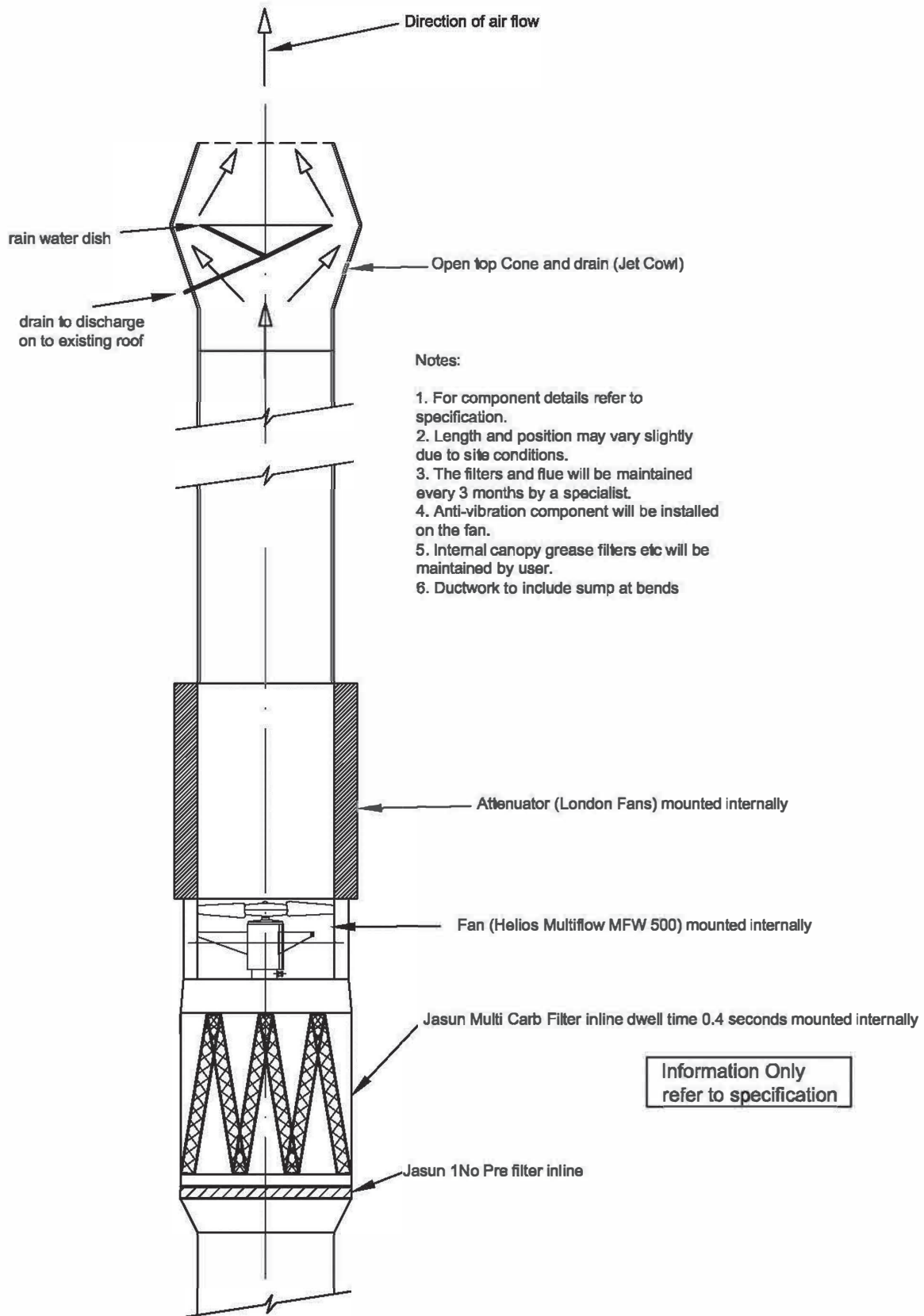
7. NOISE CONTROL / ATTENUATOR

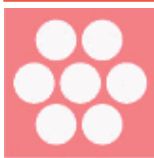
- 7.1 Noise control shall be implemented, the attenuator will be installed after fan installation as per schematic

8. FINAL TERMINATION

- 8.1 The ducting shall discharge at the ridge height of the building to which it is attached (this is approx. 4.5m above the nearest opening light, which will effectively disperse and dilute the odour and fully complies with Defra guidance. The discharge shall be vertical towards the sky with no restriction to final opening therefore a jet cowl will be used.
- 8.2 The ductwork will be partially enclosed within a GRP enclosure designed and manufactured by GRP Building Products Ltd. The duct termination has been designed to achieve a vertical efflux velocity of at least 8 metres per second (m/s)

APPENDICES





GFS1-1818

Grease Filter 18x18x1 All Stainless Steel

Description/Application

Type GFS - Stainless steel frame and mesh

Description

An economy mesh type grease filter made with a rolled stainless steel outer frame where drain holes are punched to the lower leading edge. The inner mesh of this filter is constructed using stainless steel. A less expensive stainless steel filter designed to comply with standard DW171.

Application

Extraction canopies in commercial catering and food preparation establishments.

Specification

EU Grade

Efficiency (>95%)

μ (Micron)

Capacity

Rated Capacity (CFM): 629

Rated Capacity (M³/hr): 1069

Resistance

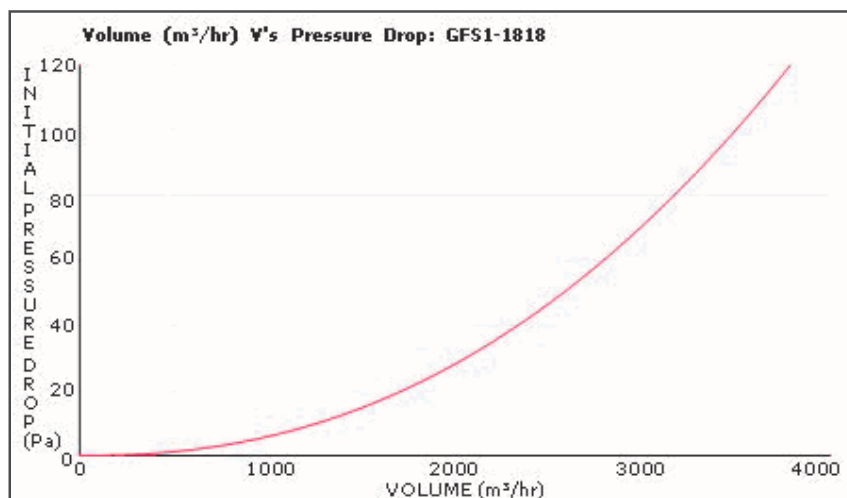
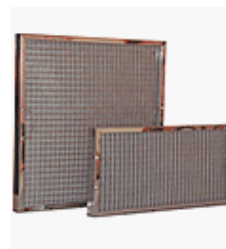
Dimensions

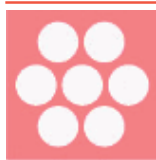
Nominal (Inches): 18x18x1

Actual (mm): 445x445x20

Pockets:

Visual





VL2-2424

V Line Panel Filter 24x24x2

Description/Application

V Line - Disposable pleated panel filters

Description

Disposable pleated panel filter made with both a water resistant card frame and retaining face. The V Line panel filters use a flame retardant, 100% thermally bonded polyester filter media backed with an expanded galvanised steel mesh.

Application

General heating and air-conditioning.

As a pre-filter to bag filters.

Specification

EU Grade

G4

Efficiency (>95%)

5 μ (Micron)

Capacity

Rated Capacity (CFM): 1569

Rated Capacity (M³/hr): 2667

Resistance

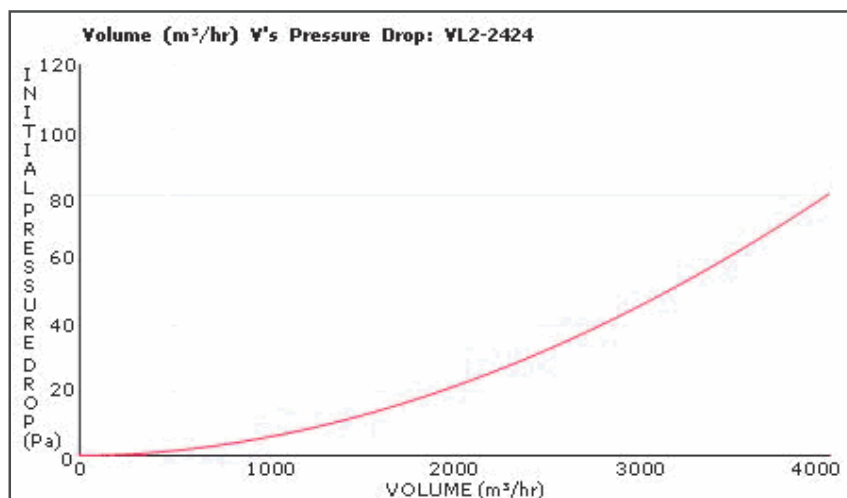
Dimensions

Nominal (Inches): 24x24x2

Actual (mm): 594x594x45

Pockets:

Visual



Multicarb Activated Carbon Discarb Units



General Description

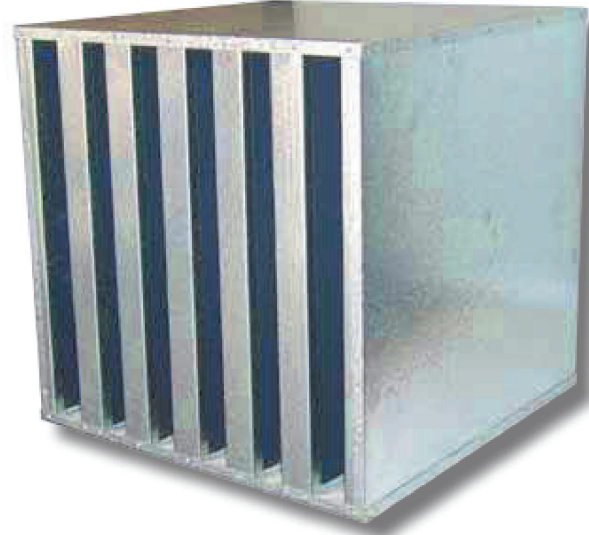
These filters are manufactured for ease of installation and incorporation into ducted air systems. They can be used on both supply for purifying incoming air, and can be used on the extract to remove toxic gasses and odours generated within a process.

Construction

These modules are manufactured by mounting a series on carbon panel filters with a sealed case. The airflow is epitomized by presenting the filtering surfaces in a "V" formation.

Each carbon panel is sealed into the filter case so as to ensure no air can bypass the carbon granules.

The panels are manufactured using long established bonding techniques which hold the activated carbon granules in a rigid biscuit. The biscuit is encapsulated in a carbon impregnated cloth which prevents any leakage of granules or powder.



The unique bonding method used by Jasun Envirocare ensures that, unlike our competitors filters, that the panels will remain intact and rigid even if wet.

Typical Applications

- Reduction of Cooking Odours
- Removal of Kerosene Exhaust Fumes
- General Odour Reduction
- Neutralisation of Ammonia and its Derivatives
- Removal of Formaldehyde
- Removal of Airborne Pollutants and Contaminants
- Removal of Acid Gases (H_2S , SO_2 , NOX , HCl)

Please check with our sales department when specifying carbon filters as most applications require a bespoke solution specifically tailored for the job in hand.

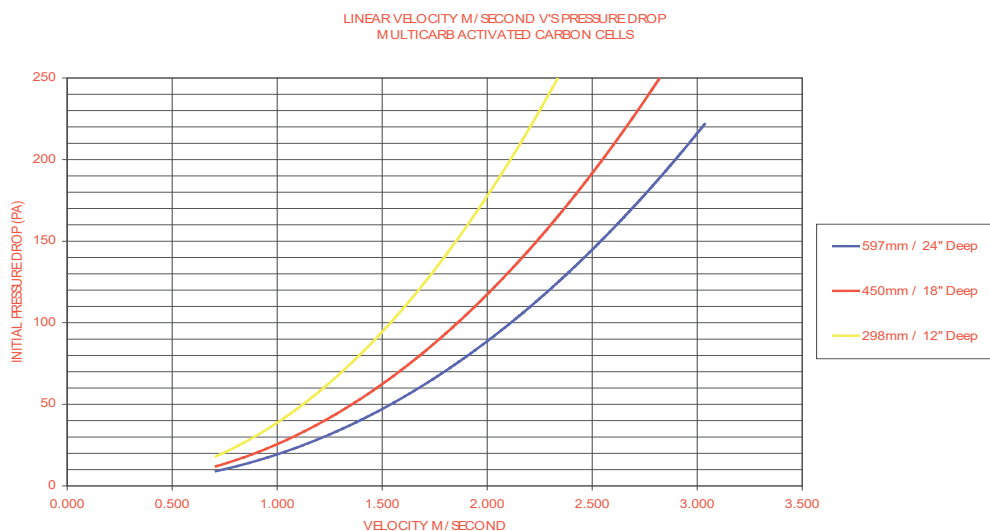


Multicarb Cells STANDARD SIZES



No.	Nominal Size (Inches)	Height (mm)	Width (mm)	Depth (mm)	Weight of Carbon (Kg)	Cell Weight	Capacity @ 0.1 Second Dwell Time
DC-CF1	24 x 24 x 8	594	594	197	10	22	800
DC-CF1-HALF	24 x 12 x 8	594	291	197	5	11	400
DC242412/8	24 x 24 x 12	594	594	292	13	24	990
DC121212	12 x 12 x 12	297	297	297	6	12	450
DC181812	18 x 18 x 12	445	445	297	13	25	990
DC241212	24 x 12 x 12	594	297	297	13	25	990
DC242412	24 x 24 x 12	594	594	297	25	36	1900
DC-CF2	24 x 24 x 16	594	594	397	18	34	1370
DC-CF2-HALF	24 x 12 x 16	594	291	397	9	18	685
DC-WA15-208	24 x 6 x 18	144	600	440	7	13	533
DC121218	12 x 12 x 18	292	292	451	10	15	761
DC181818	18 x 18 x 18	445	445	451	19	26	1445
DC241218	24 x 12 x 18	594	297	451	18	26	1369
DC242418	24 x 24 x 18	594	594	451	36	52	2740
DC121224	12 x 12 x 24	292	292	597	13	19	990
DC181824	18 x 18 x 24	445	445	597	25	36	1900
DC241224	24 x 12 x 24	594	297	597	25	36	1900
DC242424	24 x 24 x 24	594	594	597	50	61	3800

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Multiflow

Box centrifugal fans

MFW & MFD



Box centrifugal fans with
multi option outlet.

- Choice of outlet by moving side panels.
- Simplified installation through outlet options.
- Fully speed controllable.
- Insulated panels reduce condensation.
- Thermal protection of motor.
- Compact motor design.



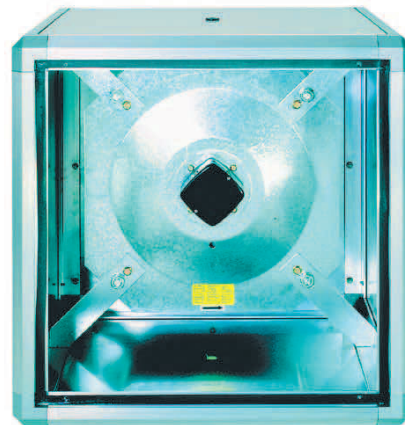
so refreshing

MFW & MFD



The front view

MFW & MFD



The rear view

Specification

□ Casing

The unit frame is manufactured from extruded aluminium profile with polymer corners. The inlet panel is galvanised sheet steel with an integral spun inlet ring. The side panels are 20 mm double skinned galvanised sheet steel filled with a non-flammable fibreglass insulation providing noise and temperature insulation.

The side panels are removable and interchangeable so that discharge is possible in different directions.

□ Impeller

All models have dynamically balanced backward curved centrifugal impellers for high efficiency and low noise levels. The blades are manufactured in plastic with galvanised support plates for sizes up to 450 mm and in aluminium for sizes 500 to 630. Each impeller together with its external rotor motor is statically and dynamically balanced to quality standard G 2.5 DIN ISO 19410.

□ Inlet cones

The inlet cone is made of galvanised sheet steel.

The cone design has been optimised to achieve the best possible airflow and is an integral part of the inlet panel.

□ Motor

External rotor motor with a die-cast aluminium casing, protected to IP 54. Thermal contacts for motor protection and radio suppression are fitted as standard. The ball bearings are sealed for life with a special lubricant to guarantee low noise and maintenance free operation.

□ Motor protection

All models are fitted with thermal contacts, which should be connected to a suitable motor protection unit (see below). The automatic resetting thermal contacts can be used wired in series with the motor windings on single-phase units. These thermal contactors are simply designed to protect the motor from damage by overheating.

□ Electrical connection

The rating plate shows the correct operating voltage range. The motor terminal box is fitted on the rear of the motor inside the unit. One side panel has a pre-drilled hole for the cable to pass through. This side panel can be positioned to suit the required side by exchanging it with any other panel.

□ Speed control

All models are speed controllable with matched 5 step auto-transformer speed controllers listed in the table below. All models can also be inverter controlled.

□ Temperatures

Maximum ambient airflow operating temperatures are shown in the table below.

□ Installation

Simple fan design for easy installation able to be installed at any angle or position with a choice of straight through or side outlet positions.

□ Guards

The Multiflow units are designed for connection into ducted systems both up-stream and down-stream and therefore are not supplied with guards. If the moving parts of the unit are exposed then suitable protection guards must be fitted.

□ Dimensions

All dimensions shown in the table are in millimetres.

□ Air performance curves.

The air performance curves have been produced using the inlet test chamber method in accordance with DIN 24163.

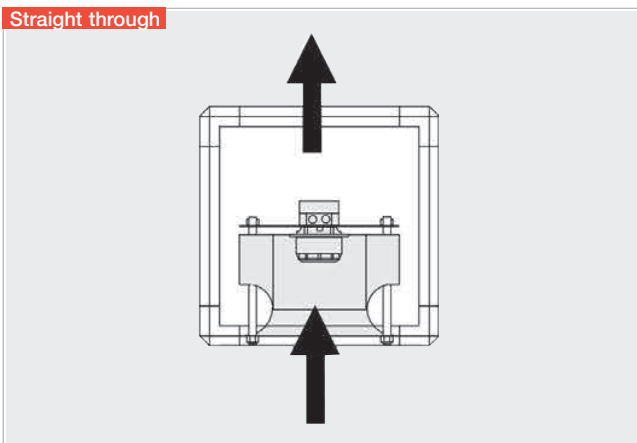
□ Sound levels

The sound levels have been produced from tests in accordance with DIN 45653 part 38. The figures are 'A' scale weighted levels L_{WA} and are given for the mid performance position with correction values for high and low pressures. The sound spectrum figures are 'A' weighted.

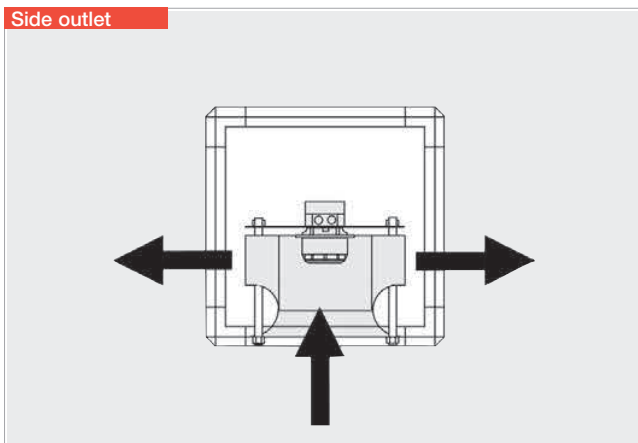
Technical data

Size mm	Model		Ref. No	Number of poles	Motor kW		Amps		Max. air flow temp. +°C	IP rating	5 Step transformer speed controller				Starter with full motor protection	
	Single phase	Three phase			230V kW	400V kW	230V A	400V A			single phase		three phase		230V	400V
											Type	Ref. No	Type	Ref. No		
355	MFW 355/4	-	7864	4	0.33	0.33	1.50	0.70	45	IP54	TSW 1.5	1495	-	-	MW	-
400	MFW 400/4	-	7865	4	0.54	0.48	2.55	0.90	45	IP54	TSW 3.0	1496	-	-	MW	-
450	MFW 450/4	-	7866	4	0.76	0.71	3.50	1.40	45	IP54	TSW 5.0	1497	-	-	MW	-
500	MFW 500/4	-	7867	4	1.70	1.80	7.50	3.70	45	IP54	TSW 7.5	1596	-	-	MW	-
560	-	MFD 560/4	7868	4	-	2.50	-	4.80	40	IP54	-	-	TSD 5.5	1503	-	MD
630	-	MFD 630/4	7869	4	-	4.00	-	6.90	40	IP54	-	-	TSD 7.0	1504	-	MD

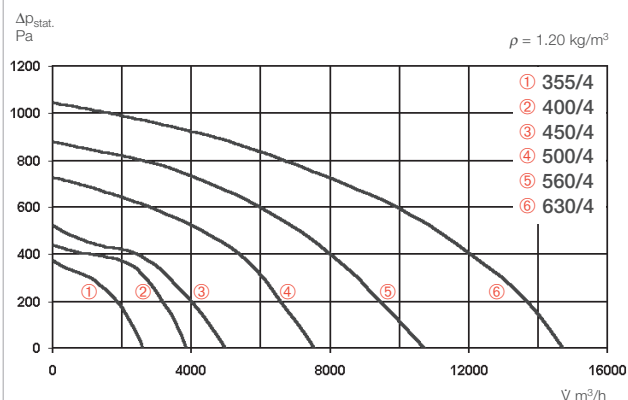
Straight through



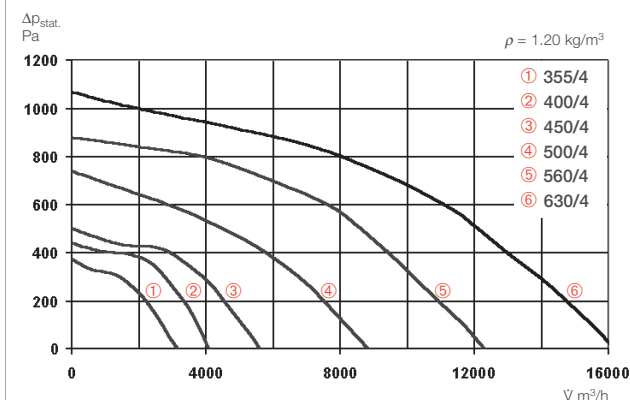
Side outlet



Straight through



Side outlet



Selection table

Straight through

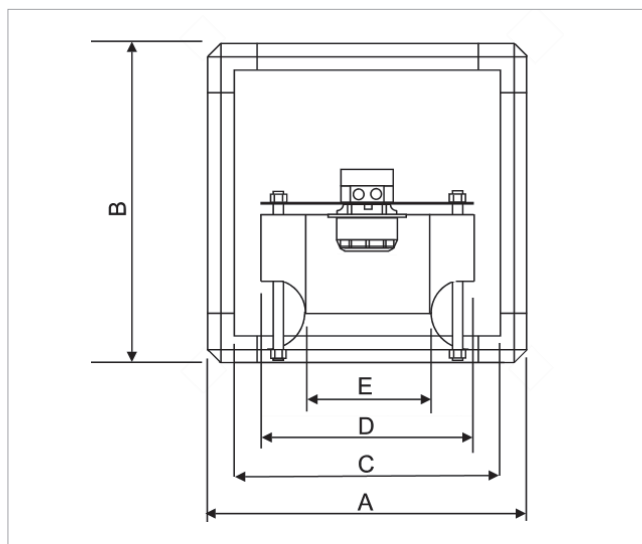
Size	Model	Electrical supply	Air volume flow m³/s against static pressure Pa												
			0	50	100	150	200	250	300	400	500	600	700	800	900
355	MFW 355/4	230 V/1ph /50 Hz	0.722	0.683	0.636	0.583	0.522	0.433	0.322						
400	MFW 400/4	230 V/1ph /50 Hz	1.069	1.036	0.992	0.944	0.886	0.822	0.747	0.333					
450	MFW 450/4	230 V/1ph /50 Hz	1.389	1.333	1.261	1.181	1.114	1.028	0.939	0.683					
500	MFW 500/4	230 V/1ph /50 Hz	2.097	2.042	1.967	1.903	1.833	1.767	1.694	1.500	1.208	0.792	0.222		
560	MFD 560/4	400 V/3ph /50 Hz	2.972	2.889	2.806	2.722	2.625	2.528	2.444	2.222	1.986	1.667	1.278	0.750	
630	MFD 630/4	400 V/3ph /50 Hz	4.083	4.028	3.958	3.889	3.806	3.708	3.611	3.347	3.083	2.764	2.347	1.875	1.306

Selection table

Side outlet

Size	Model	Electrical supply	Air volume flow m³/s against static pressure Pa												
			0	50	100	150	200	250	300	400	500	600	700	800	900
355	MFW 355/4	230 V/1ph /50 Hz	0.872	0.808	0.750	0.689	0.619	0.525	0.403						
400	MFW 400/4	230 V/1ph /50 Hz	1.130	1.089	1.036	0.986	0.928	0.856	0.775	0.444					
450	MFW 450/4	230 V/1ph /50 Hz	1.556	1.500	1.417	1.347	1.264	1.189	1.089	0.828					
500	MFW 500/4	230 V/1ph /50 Hz	2.458	2.364	2.272	2.194	2.089	1.986	1.883	1.611	1.261	0.789	0.242		
560	MFD 560/4	400 V/3ph /50 Hz	3.417	3.344	3.250	3.161	3.042	2.939	2.833	2.625	2.043	2.111	1.672	1.111	
630	MFD 630/4	400 V/3ph /50 Hz	4.500	4.389	4.292	4.208	4.097	3.972	3.875	3.611	3.361	3.083	2.722	2.250	1.514

Dimensions and weights

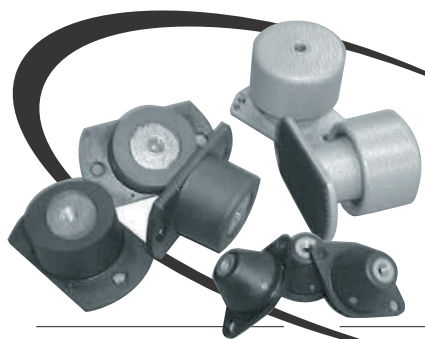


Type	Ref No.	Dimensions in mm					kg
		A	B	C	D	E	
MFW 355/4	7864	500	500	420	365	224	33
MFW 400/4	7865	670	670	590	404	253	52
MFW 450/4	7866	670	670	590	454	286	58
MFW 500/4	7867	670	670	590	504	321	66
MFD 560/4	7868	800	800	720	570	361	95
MFD 630/4	7869	800	800	720	634	407	105

Sound levels

Inlet/ outlet mm	Model	Ref. No.	Sound power dB(A)	Sound pressure level at 4 m dB(A)	High pressure add	Low pressure add	Sound power level dB(A)							
							63	125	250	500	1000	2000	4000	8000
Nominal size 355														
Inlet	MFW 355/4	7864	66	46	-3	4	39	53	58	60	60	67	53	48
Outlet	MFW 355/4	7864	70	50	-3	4	43	58	61	63	65	62	53	48
Nominal size 400														
Inlet	MFW 400/4	7865	72	52	-2	3	45	60	64	66	66	63	59	53
Outlet	MFW 400/4	7865	76	56	-2	3	47	64	68	69	71	68	60	55
Nominal size 450														
Inlet	MFW 450/4	7866	74	54	-2	5	46	61	65	67	68	66	62	52
Outlet	MFW 450/4	7866	78	68	-2	5	49	68	70	71	73	70	63	53
Nominal size 500														
Inlet	MFW 500/4	7867	74	58	-2	4	55	61	66	66	70	69	61	54
Outlet	MFW 500/4	7867	82	62	-2	4	54	66	74	75	77	74	66	56
Nominal size 560														
Inlet	MFD 560/4	7868	82	62	-5	2	59	65	70	70	74	73	65	58
Outlet	MFD 560/4	7868	86	66	-5	2	58	70	78	79	81	78	70	60
Nominal size 630														
Inlet	MFD 630/4	7869	86	66	-1	4	63	69	74	74	79	78	70	61
Outlet	MFD 630/4	7869	90	70	-1	4	60	74	81	85	85	82	75	67

The sound levels are given for the mid pressure of the fans performance. The amount to add to all figures where high or low pressure selections are made are shown in the table above.



Anti Vibration Mounts (AV's)

Introduction

Anti-vibration mounting kits are available in both rubber and spring type, the correct selection and type employed will depend on the accurate calculation of the weight of the assembly to be supported.

Installation

AV mounts should not be fitted to a fan/silencer assembly unless there are flexible connectors fitted between the assembly and associated duct work.

AV mounts should be installed with the matched mounting feet and positioned such that they carry an equal proportion of the assembly weight. This is particularly important where fans and silencers are installed on suspension rods.

Figure 1. NAV 1 to NAV 5 (Resilient Rubber)

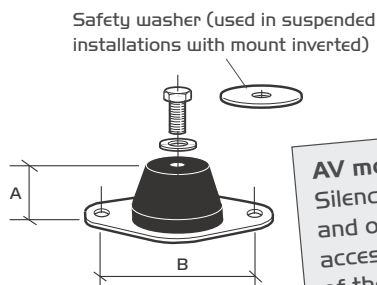


Figure 2. NAV 6 (Resilient Rubber)

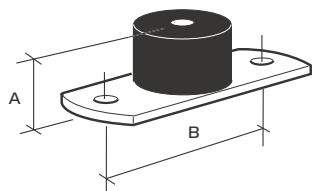
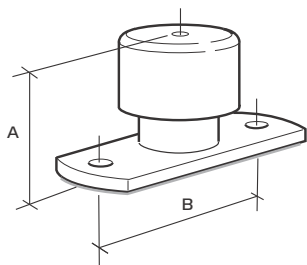


Figure 3. NAV 49 to NAV 58 (Spring)

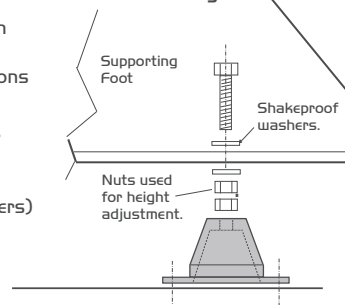


AV mounts are maintenance free but a periodical inspection is recommended to check security of fixings and condition of rubbers and springs.

Resilient Mounting Details

Figure 4.

Resilient Mounting 'Floor' fixing

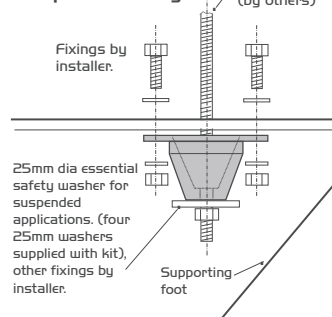


NAV 1 to NAV 5 shown in floor (Figure 4) and suspended configurations (Figure 5).

Fans using size NAV 6 upwards require supporting steelwork to be designed (by others) for suspended applications.

Figure 5.

Resilient Mounting 'Suspended' fixing



AV mounts isolate the fan only. Silencers/backdraught dampers and other "significant mass" accessories should form part of the fixed ductwork after the flexible connection.

Dimensions (mm) and Weights

Rubber Type

Code	A	B	Max. kg per kit
NAV1	30	50	20
NAV2	40	75	80
NAV3	40	75	180
NAV4	40	75	260
NAV5	40	75	130
NAV6	50	100	320

Spring Type

NAV49	77	76	400
NAV50	77	76	480
NAV51	77	76	520
NAV52	87	127	600
NAV53	87	127	700
NAV54	87	127	800
NAV55	87	127	950
NAV56	87	127	1110
NAV57	87	127	1270
NAV58	87	127	1430



Nuaire Limited Western Industrial Estate Caerphilly United Kingdom CF83 1NA
Telephone: 029 2088 5911 Facsimile: 029 2088 7033
Email: info@nuaire.co.uk www.nuaire.co.uk

Leaflet Number 671224 October 2004

ATTENUATORS

Internal or External/Roof mounted



Cylindrical Silencers for the efficient reduction of airborne noise.



RANGE

Size 250mm to 1250mm diameter. Standard lengths are:

1 x fan dia (1D) or 2 x fan dia (2D).



STRAIGHT THROUGH TYPE

Straight Through type without the centre pod reduce the fan noise with negligible effect to the fan performance.

POD TYPE

These have a centre pod for enhanced noise reduction. Our fan selection software will take account of the additional system resistance when selecting this product.

MOUNTING

All units are suitable for internal or external operation at any installed angle.

FLANGES

Internal flanges with threaded inserts match ISO fan sizes.



PRODUCT RANGE

- Long Cased Axial
- Bifurcated Axial
- Plate or Short Cased Axial
- Axial Impellers
- Smoke Extract
- Boxed Centrifugal
- Propeller
- Flameproof (Hazardous Area)
- Roof Mounted
- Portable

We can also design and manufacture fans to suit non standard or special applications.



MELINEX LINING

For damp or grease laden air we can supply attenuators with this special lining. This will also contain any loose mineral fibres, making the units suitable for clean environments such as hospitals.

OPERATING TEMPERATURES

From -20°C to +200°C as standard; units for operation beyond these limits are also available for smoke extract applications.

SPECIAL UNITS

We can also supply attenuators with built in spigot for flexible duct connection or rectangular type. Please consult our sales team for any non standard requirements.

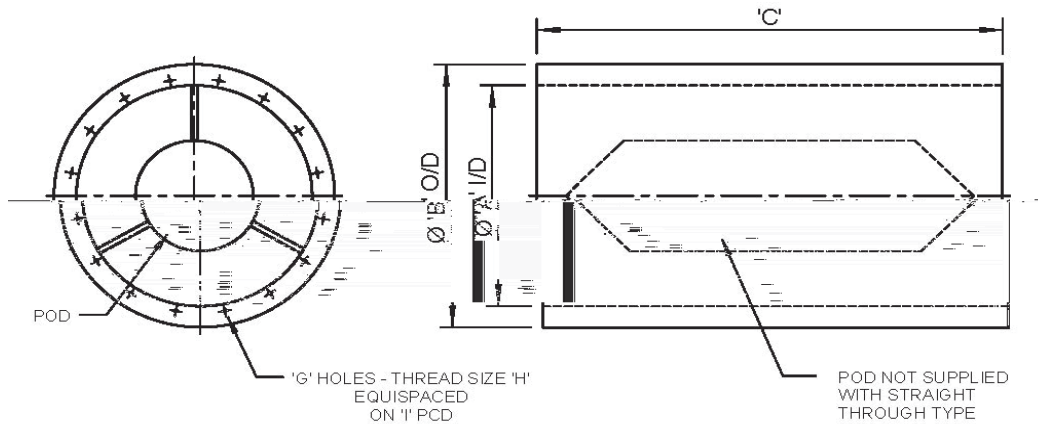
MATERIAL

Units are manufactured from galvanised steel with sealed seams. The inner lining is perforated galvanised steel enclosing mineral fibre slabs for sound absorption.

Attenuator insertion loss data

		Straight Through Type (no pod)								Pod Type							
Dia	Length	Octave band mid frequencies Hz								Octave band mid frequencies Hz							
mm	[x Dia]	63	125	250	500	1k	2k	4k	8k	63	125	250	500	1k	2k	4k	8k
250	1D	1	2	2	8	10	8	8	7	2	6	8	13	21	24	22	18
	2D	1	3	4	13	18	12	12	10	3	12	13	23	29	29	19	20
315	1D	1	2	4	9	11	10	9	7	2	7	8	14	22	25	22	19
	2D	2	2	5	13	18	12	11	10	3	13	14	23	30	30	20	25
355	1D	2	3	5	11	13	11	10	8	2	6	8	11	22	24	21	16
	2D	3	4	7	14	18	15	11	10	3	10	15	22	29	30	29	22
400	1D	2	3	5	10	13	11	9	8	2	7	9	15	23	25	21	17
	2D	3	4	8	14	18	14	11	9	3	10	14	24	30	29	28	21
450	1D	2	3	6	12	13	11	9	7	2	6	8	16	23	23	21	16
	2D	3	4	8	17	18	15	11	10	3	7	12	22	29	29	25	20
500	1D	2	3	6	14	14	12	10	5	2	7	9	17	24	24	20	16
	2D	3	7	8	19	20	17	14	11	4	10	16	26	29	29	29	20
560	1D	2	4	7	14	14	9	9	7	3	7	9	18	24	24	20	15
	2D	3	6	10	19	20	14	12	10	4	9	17	27	29	28	23	23
630	1D	2	5	7	15	13	9	9	8	3	5	9	18	25	22	18	13
	2D	4	7	13	21	21	14	13	12	5	9	18	28	30	29	24	19
710	1D	3	5	9	15	14	10	9	8	3	5	10	19	25	22	18	14
	2D	4	9	16	22	23	17	13	9	5	9	17	28	29	30	26	20
800	1D	3	5	9	16	14	10	8	8	4	5	10	15	25	22	19	14
	2D	4	6	10	21	23	17	12	10	5	8	18	29	30	29	27	19
900	1D	3	5	10	17	15	11	9	8	5	6	11	21	23	22	17	13
	2D	4	6	13	22	21	14	12	11	5	11	18	29	30	26	19	16
1000	1D	4	6	11	17	15	11	9	8	5	6	13	22	25	21	17	14
	2D	5	10	16	23	23	16	13	11	5	10	19	29	30	27	22	18
1250	1D									3	6	13	21	23	14	10	9
	2D									6	12	26	41	44	30	16	13

Refer to our Sales Office for data relating to Melinex lined attenuators.



Dimensions in mm

A	B	C		G	H	I	Approx Weight kg			
		1D	2D				1D	2D	1D Pod	2D Pod
250	320	250	500	4	M6	280	7	11	9	13
315	455	315	630	8	M6	355	9	15	11	17
400	540	400	800	8	M10	450	13	22	16	26
500	664	500	1000	12	M10	560	18	32	22	37
560	724	560	1120	12	M10	620	22	39	26	46
630	794	630	1260	12	M10	690	26	48	32	47
710	874	710	1420	16	M10	770	32	59	39	71
800	964	800	1600	16	M10	860	40	74	49	90
900	1064	900	1800	16	M12	970	55	102	67	123
1000	1190	1000	2000	16	M12	1070	66	124	82	151
1120	1310	1120	2240	20	M12	1190	137	220	156	253
1250	1440	1250	2500	20	M12	1320	165	334	192	380