

EXTRACTION & VENTILATION
SYSTEM STATEMENT

**421, Bradford Road,
Batley, WF17 5LY**

Extraction Ventilation Statement

The main elements of the grease and odour control system starts in the kitchen and will be accordance with the following:

Kitchen Canopy Extraction Requirements

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.

The canopy will be constructed from stainless steel and will be fitted with primary grease filters. 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 min 1m centers.

Primary grease filters will be cleaned daily, However a second set of filters will be used and 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 this system has been designed to have 0.8s residence time.

Pleated Panel Filter

This filter will be installed in the ductwork within the filter housing before the fine filter this will be a disposable pleated panel filter in the ductwork. This filter can be incorporated in-line but prior to the odour control/filtration, in the same filtration housing. The secondary filter shall be replaced every 3 months, however this could be done earlier depending on the volume of cooking.

Fine Filter

This filter will be installed in the ductwork within the filter housing before the odour control/filtration the filter would be constructed of fibre glass and be used to remove any smaller particles.

Odour Control Filtration (Carbon Filter)

Activated carbon filters will be installed after the secondary filter.

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 0.8s. 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.

Activated carbon filters shall be replaced every 3 months.

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. The filter housing has been designed to ensure ease of access for maintenance and to provide a good seal around the filters to prevent gases bypassing the filters, rendering them ineffective.

The internal surfaces of the filter housing shall be cleaned monthly.

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.

Odour Filtration Selection

Assessment and risk of odour and filtration techniques have been assessed against Defra “Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems”

Risk Assessment

Dispersion: 15

Proximity of receptors: 10

Size of kitchen: 1

Cooking type (odour
and grease loading): 7

Total: 33

The extract air would disperse at ridge level based on the score level of 30 it is considered that the level of odour abatement required would be high therefore a pre filter, fine filter and carbon filter is sufficient.

The odour control is in accordance with Defra guidelines: Annex C

The above odour control selection fulfills the requirements of the guidelines were a high level of odour control filtration is required.

Extraction Motor / Fan

The extraction motor has been correctly rated for the application and at the correct speed/flow rate to achieve optimum performance of the filtration. The shall be Helios Multiflow 500dia 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, two speed or variable speed design, adjusted so that the speed settings correlate to and achieve the optimum flow rates of the odour control system.

Noise Control / Attenuator

Noise control shall be implemented; attenuator will be installed after fan installation as per schematic. The attenuation will be of pod type supplied by London Fans.

Noise Level Assessment

British Standard 8233:1999 'Sound insulation and noise reduction for buildings – Code of Practice' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS8233:1999 recommends 30-35dB(A) as being 'Good' to 'Reasonable' internal resting/sleeping conditions. With external levels of 40dB(A) at this window, the window itself would need to provide 10dB attenuation to achieve 'Good' conditions. However, according to BS8233:1999, a partially open window offers between 10-15dB attenuation.

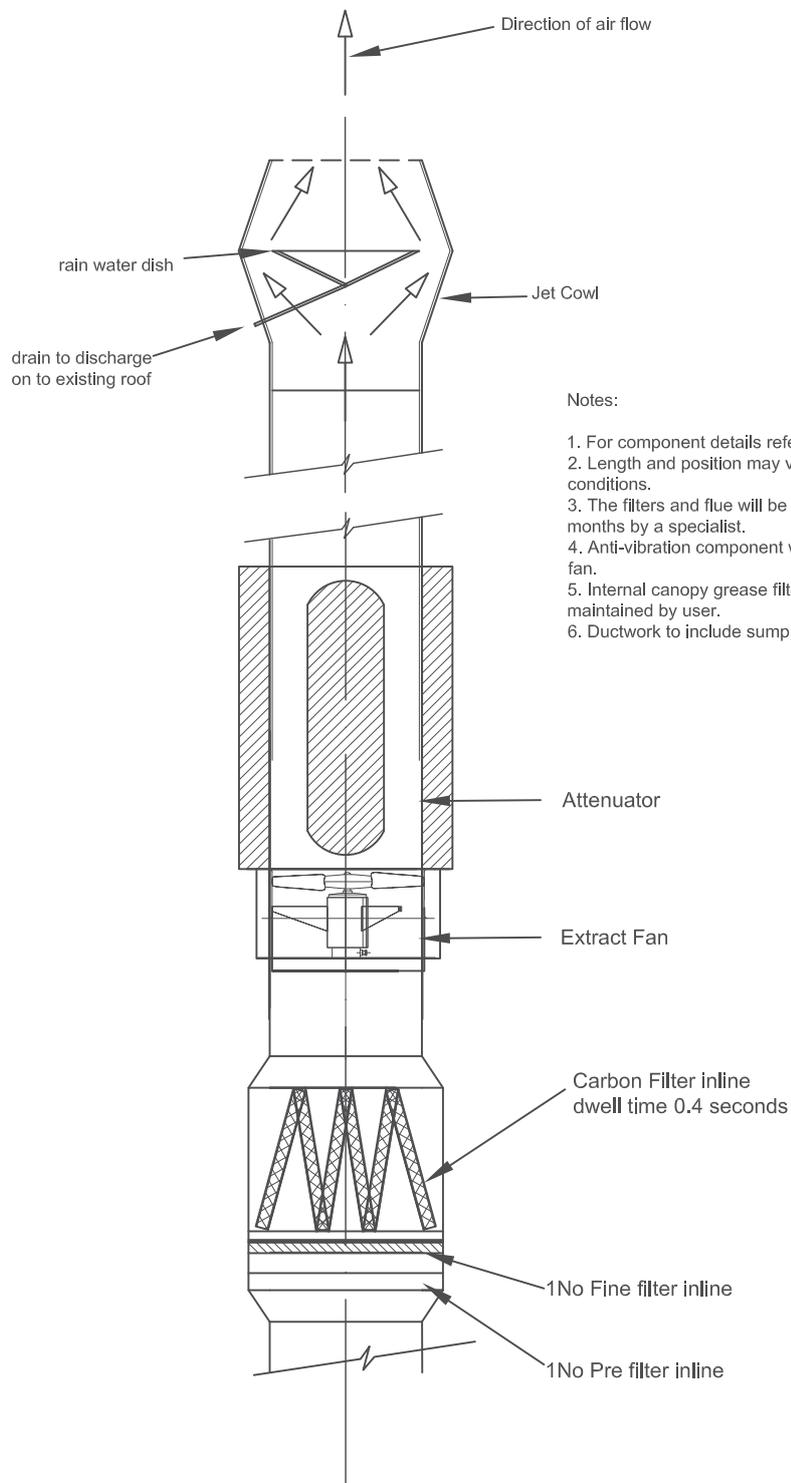
The design has taken into consideration that the noise level from the extract fan/ductwork should not exceed 40dB. Therefore our target level would be 40dB @ to the external sensitive point. The closest receptor would be the first floor window which is 2m from the extraction fan. We have calculated the sound pressure level at 2m from the fan which well below the requirements, the levels would be 36.9 dB(A) to the closest receptor.

Extract Fan Details

We propose to use MFW 500/4 extract fan, Sound levels provided by manufacturer as The calculations (enclosed next page) predict a sound level of below 36.9dB @2m when installed with attenuation which is considered satisfactory.

Final Termination

The ducting shall discharge 1m above eaves level with no restriction to final opening. Duct termination has been designed to achieve a vertical efflux velocity of at least 8 metres per second (m/s).



Notes:

1. For component details refer to specification.
2. Length and position may vary slightly due to site conditions.
3. The filters and flue will be maintained every 3 months by a specialist.
4. Anti-vibration component will be installed on the fan.
5. Internal canopy grease filters etc will be maintained by user.
6. Ductwork to include sump at bends

Sound Pressure Level at 1st Floor Window

Source Noise Levels

| Octave band centre frequency | 31.5 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Hz |
|----------------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Sound Power Level (PWL, Lw) | 54 | 66 | 74 | 74 | 75 | 77 | 74 | 66 | 56 | dB |
| Reduction by silencing equipment | -4 | -10 | -16 | -16 | -26 | -29 | -29 | -29 | -20 | dB |
| Attenuation by duct bend (1) | 0 | -1 | -7 | -7 | -6 | -3 | -3 | -3 | -3 | dB |

Immission Point (listener)

Distance from Source 2 m

CALCULATION RESULTS

| Sound spectra and overall levels | 31.5 | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Hz | Overall levels |
|---|------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|------|----|-------------------|
| Source levels | | | | | | | | | | | |
| Sound Power Level (PWL) | 0 | 54 | 66 | 74 | 75 | 77 | 74 | 66 | 56 | | 81.5 dB |
| Silencing measures | 0 | 4 | 10 | 16 | 26 | 29 | 29 | 29 | 20 | | |
| Silenced Sound Power Level (PWL) | 0 | 50 | 56 | 58 | 49 | 48 | 45 | 37 | 36 | | 54.0 dB(A) |
| Attenuation | | | | | | | | | | | |
| Attenuation by distance of 2 m | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | |
| Attenuation by atmospherical absorption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.1 | | |
| Immission (listener's) point | | | | | | | | | | | |
| Sound Pressure Level (SPL, Lp) | 33.0 | 39.0 | 41.0 | 32.0 | 31.0 | 28.0 | 19.9 | 18.9 | | | 44.2 dB |
| A - weighting | -39.4 | -26.2 | -16.1 | -8.6 | -3.2 | 0 | 1.2 | 1 | -1.1 | | |
| A - weighted SPLA, LpA | 6.8 | 22.9 | 32.4 | 28.8 | 31.0 | 29.2 | 20.9 | 17.8 | | | 36.9 dB(A) |

Baffle Filter Model GFBE



GENERAL DESCRIPTION

These filters are designed for use in commercial kitchens and ventilation from food preparation areas where their primary function is to reduce flame from travelling from the cooking area up into the extract duct.

Construction

These filters are manufactured by rolling stainless steel to create a series of baffle plates which are welded onto a sub frame. The sub frame is then wrapped with the outer frame.

Features

- Strong Double frame construction
- Scratch Free outer surface
- Bright Polished Surface
- Fold down handles
- Drain Holes
- Rolled Safety Edges
- Low Price
- Ex-Stock Delivery

Frame Material

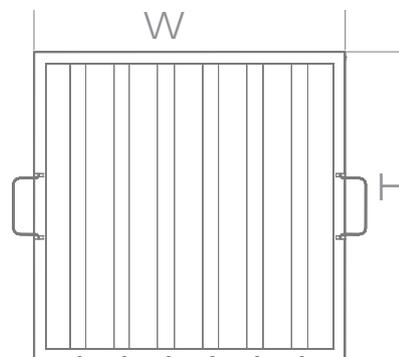
- Stainless Steel to Specification BS1449(2)
- Bright Polished Surface



GFBE Baffle Filter STANDARD SIZES



Jasun Envirocare always specify filters as Height (H) x Width (W) This is particularly important with baffle filters because the handles will always go on the H edge, the blades will always run along the H edge, and the drain holes will always be in the W edge



| Part No. | Nominal Size Inches | Height (mm) | Width (mm) | Depth (mm) | Minimum Airflow m ³ /hr | Recommended Airflow m ³ /hr | Maximum Airflow m ³ /hr |
|-----------|---------------------|-------------|------------|------------|------------------------------------|--|------------------------------------|
| GFBE-1020 | 10 x 20 x 2 | 241 | 495 | 45 | 490 | 558 | 644 |
| GFBE-1212 | 12 x 12 x 2 | 292 | 292 | 45 | 350 | 399 | 460 |
| GFBE-1216 | 12 x 16 x 2 | 292 | 394 | 45 | 472 | 538 | 621 |
| GFBE-1224 | 12 x 24 x 2 | 292 | 594 | 45 | 712 | 812 | 937 |
| GFBE-1616 | 16 x 16 x 2 | 394 | 394 | 45 | 637 | 727 | 838 |
| GFBE-1620 | 16 x 20 x 2 | 394 | 495 | 45 | 800 | 913 | 1053 |
| GFBE-1625 | 16 x 25 x 2 | 394 | 622 | 45 | 1006 | 1147 | 1323 |
| GFBE-1818 | 18 x 18 x 2 | 445 | 445 | 45 | 813 | 927 | 1069 |
| GFBE-2010 | 20 x 10 x 2 | 495 | 241 | 45 | 490 | 558 | 644 |
| GFBE-2016 | 20 x 16 x 2 | 495 | 394 | 45 | 800 | 913 | 1053 |
| GFBE-2020 | 20 x 20 x 2 | 495 | 495 | 45 | 1006 | 1147 | 1323 |
| GFBE-2025 | 20 x 25 x 2 | 495 | 622 | 45 | 1264 | 1441 | 1663 |
| GFBE-2424 | 24 x 24 x 2 | 597 | 597 | 45 | 1463 | 1668 | 1925 |

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| Pressure Drop | |
|---------------------------------|-------|
| Minimum | 57Pa |
| Recommended | 76Pa |
| Maximum | 100Pa |
| Final Recommended Pressure Drop | |



Manufacturing
Air Filters in
the UK for
Over

40
Years

V Line Pleated Panel Filter Economy Standard



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.

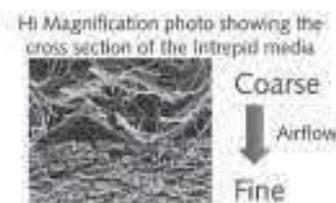
Kimberley Clark Patented Intrepid Media

- 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

Test Comparing Filtration efficiency V's different sized particles. Intrepid Media V's Cotton Polyester 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 |

| | | |
|-------------------------------------|---------------|-----------------------|
| 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 |



V Line Panel Filter (VL) STANDARD SIZES

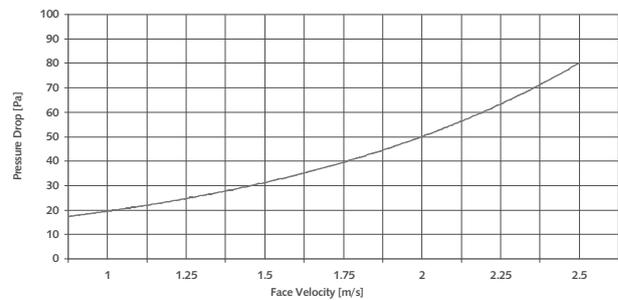


| No. | Nominal Size Inches | Height (mm) | Width (mm) | Depth (mm) | Rated Airflow m ³ /hr |
|----------|---------------------|-------------|------------|------------|----------------------------------|
| VL4-1010 | 10x10x4 | 241 | 241 | 95 | 544 |
| VL4-1020 | 10x20x4 | 241 | 495 | 95 | 1117 |
| VL4-1212 | 12x12x4 | 292 | 292 | 95 | 798 |
| VL4-1224 | 12x24x4 | 292 | 594 | 95 | 1623 |
| VL4-1515 | 15x15x4 | 368 | 368 | 95 | 1268 |
| VL4-1520 | 15x20x4 | 368 | 495 | 95 | 1705 |
| VL4-1616 | 16x16x4 | 394 | 394 | 95 | 1453 |
| VL4-1620 | 16x20x4 | 394 | 495 | 95 | 1825 |
| VL4-1625 | 16x25x4 | 394 | 622 | 95 | 2294 |
| VL4-1818 | 18x18x4 | 445 | 445 | 95 | 1854 |
| VL4-1831 | 18x31x4 | 445 | 775 | 95 | 3228 |
| VL4-2020 | 20x20x4 | 495 | 495 | 95 | 2293 |
| VL4-2024 | 20x24x4 | 495 | 594 | 95 | 2752 |
| VL4-2025 | 20x25x4 | 495 | 622 | 95 | 2882 |
| VL4-2424 | 24x24x4 | 594 | 594 | 95 | 3303 |

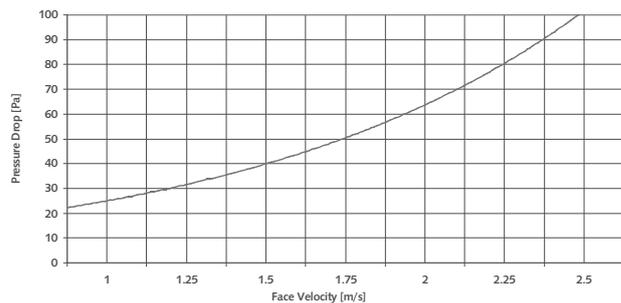
| No. | Nominal Size Inches | Height (mm) | Width (mm) | Depth (mm) | Rated Airflow m ³ /hr |
|----------|---------------------|-------------|------------|------------|----------------------------------|
| VL2-1010 | 10x10x2 | 241 | 241 | 45 | 418 |
| VL2-1020 | 10x20x2 | 241 | 495 | 45 | 859 |
| VL2-1212 | 12x12x2 | 292 | 292 | 45 | 614 |
| VL2-1224 | 12x24x2 | 292 | 594 | 45 | 1249 |
| VL2-1515 | 15x15x2 | 368 | 368 | 45 | 975 |
| VL2-1520 | 15x20x2 | 368 | 495 | 45 | 1312 |
| VL2-1619 | 16x19x2 | 394 | 470 | 45 | 1333 |
| VL2-1620 | 16x20x2 | 394 | 495 | 45 | 1404 |
| VL2-1624 | 16x24x2 | 394 | 594 | 45 | 1685 |
| VL2-1625 | 16x25x2 | 394 | 622 | 45 | 1764 |
| VL2-1818 | 18x18x2 | 445 | 445 | 45 | 1426 |
| VL2-1820 | 18x20x2 | 445 | 495 | 45 | 1586 |
| VL2-1824 | 18x24x2 | 445 | 594 | 45 | 1903 |
| VL2-2020 | 20x20x2 | 495 | 495 | 45 | 1764 |
| VL2-2024 | 20x24x2 | 495 | 594 | 45 | 2117 |
| VL2-2025 | 20x25x2 | 495 | 622 | 45 | 2217 |
| VL2-2424 | 24x24x2 | 594 | 594 | 45 | 2540 |

| No. | Nominal Size Inches | Height (mm) | Width (mm) | Depth (mm) | Rated Airflow m ³ /hr |
|----------|---------------------|-------------|------------|------------|----------------------------------|
| VL1-1010 | 10x10x1 | 241 | 241 | 20 | 314 |
| VL1-1020 | 10x20x1 | 241 | 495 | 20 | 644 |
| VL1-1212 | 12x12x1 | 292 | 292 | 20 | 460 |
| VL1-1224 | 12x24x1 | 292 | 594 | 20 | 937 |
| VL1-1515 | 15x15x1 | 368 | 368 | 20 | 731 |
| VL1-1520 | 15x20x1 | 368 | 495 | 20 | 984 |
| VL1-1619 | 16x19x1 | 394 | 470 | 20 | 1000 |
| VL1-1620 | 16x20x1 | 394 | 495 | 20 | 1053 |
| VL1-1624 | 16x24x1 | 394 | 594 | 20 | 1264 |
| VL1-1625 | 16x25x1 | 394 | 622 | 20 | 1323 |
| VL1-1818 | 18x18x1 | 445 | 445 | 20 | 1069 |
| VL1-1820 | 18x20x1 | 445 | 495 | 20 | 1189 |
| VL1-1824 | 18x24x1 | 445 | 594 | 20 | 1427 |
| VL1-2020 | 20x20x1 | 495 | 495 | 20 | 1323 |
| VL1-2024 | 20x24x1 | 495 | 594 | 20 | 1588 |
| VL1-2025 | 20x25x1 | 495 | 622 | 20 | 1663 |
| VL1-2424 | 24x24x1 | 594 | 594 | 20 | 1905 |

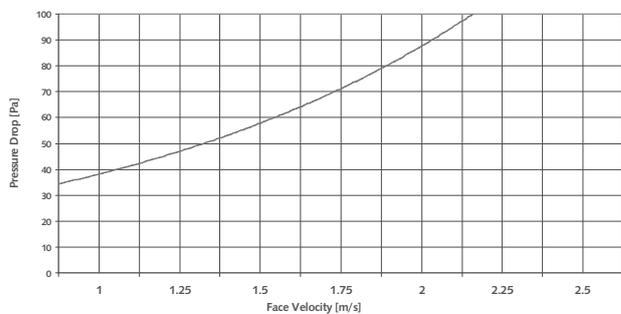
Pressure Drop vs/ Face Velocity
V Line VL4 Panel Filter 95mm Thick



Pressure Drop vs/ Face Velocity
V Line VL2 Panel Filter 45mm Thick



Pressure Drop vs/ Face Velocity
Vline VL1 Panel Filter 20mm Thick





Manufacturing
Air Filters in
the UK for
Over

40
Years

Ultima AG High Temperature Fine Filter



Product Description

The Ultima AG range of compact filters are designed for use in high temperature applications. Typically we see them used in kitchen extract, process, and paint spray, however it is a versatile and robust filter which can be used in all situations.

Features

- MEDIA = Glass fibre paper
- SEPARATORS = Aluminium Corrugation with Safety edge
- FRAME = Galvanised Steel with Header 292mm Deep
- HEADER = Single header as standard, double header as an option
- GASKET = As Requested
- GRIDS = On request
- FLAMMABILITY Rated to CP413 - BS5588:Part 9
- Maximum Continuous Operating Temperature: 250 °C



BD
EG



| Filter Efficiency to BS EN 779:2012 | | F6 (M6) | F7 | F8 | F9 |
|--|---------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Minimum Test Efficiency (MTE) @ 0.4 µ | | NA | 52% | 63% | 80% |
| Depth | Rated Airflow | Initial Pressure Drop | Initial Pressure Drop | Initial Pressure Drop | Initial Pressure Drop |
| 292mm | 2.70m/sec | 113Pa | 141Pa | 163Pa | 175Pa |
| Maximum Final Recommended Pressure Drop 450Pa | | | | | |

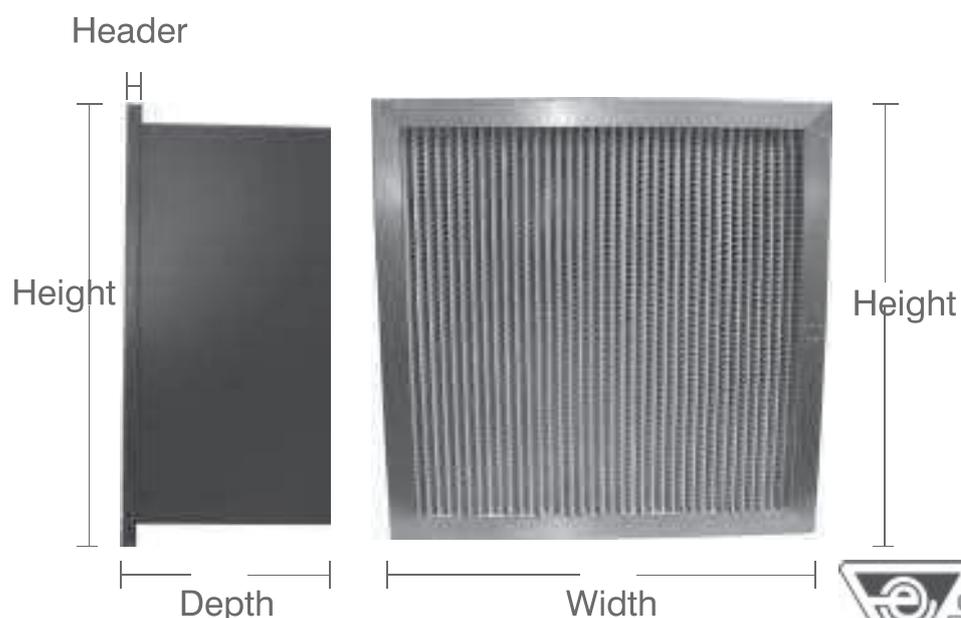


Ultima AG Standard sizes and capacities

| Model Number | Rated Airflow | Header Dimensions (mm) | | | Depth (mm) | Grade | Initial Pressure Drop | Weight (Kg) | Energy Rating Eurovent 4/11 |
|--------------|------------------------|------------------------|-------|-----------|------------|-------|-----------------------|-------------|-----------------------------|
| | | Height | Width | Thickness | | | | | |
| UAG6-2412 | 3400m ³ /hr | 592 | 592 | 20 | 292 | F6 | 113pa | 8.2 | G >1550kWh |
| UAG6-2012 | 2800m ³ /hr | 492 | 592 | 20 | 292 | F6 | 113pa | 6.8 | |
| UAG6-1212 | 1700m ³ /hr | 289 | 592 | 20 | 292 | F6 | 113pa | 4.0 | |
| UAG7-2412 | 3400m ³ /hr | 592 | 592 | 20 | 292 | F7 | 141Pa | 8.2 | E 2086kWh |
| UAG7-2012 | 2800m ³ /hr | 492 | 592 | 20 | 292 | F7 | 141Pa | 6.8 | |
| UAG7-1212 | 1700m ³ /hr | 289 | 592 | 20 | 292 | F7 | 141Pa | 4.0 | |
| UAG8-2412 | 3400m ³ /hr | 592 | 592 | 20 | 292 | F8 | 163Pa | 8.2 | D 2332kWh |
| UAG8-2012 | 2800m ³ /hr | 492 | 592 | 20 | 292 | F8 | 163Pa | 6.8 | |
| UAG8-1212 | 1700m ³ /hr | 289 | 592 | 20 | 292 | F8 | 163Pa | 4.0 | |
| UAG9-2412 | 3400m ³ /hr | 592 | 592 | 20 | 292 | H10 | 175Pa | 8.2 | B 2443kWh |
| UAG9-2012 | 2800m ³ /hr | 492 | 592 | 20 | 292 | H10 | 175Pa | 6.8 | |
| UAG9-1212 | 1700m ³ /hr | 289 | 592 | 20 | 292 | H10 | 175Pa | 4.0 | |

Final Recommended Pressure Drop 600Pa

Header thickness may be specified as 12mm, 20mm, 25mm, 38mm, 45mm as options to the standard 20mm. Double Header may also be specified.



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 epitomize 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 (H₂S, SO₂, NO_x, 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.



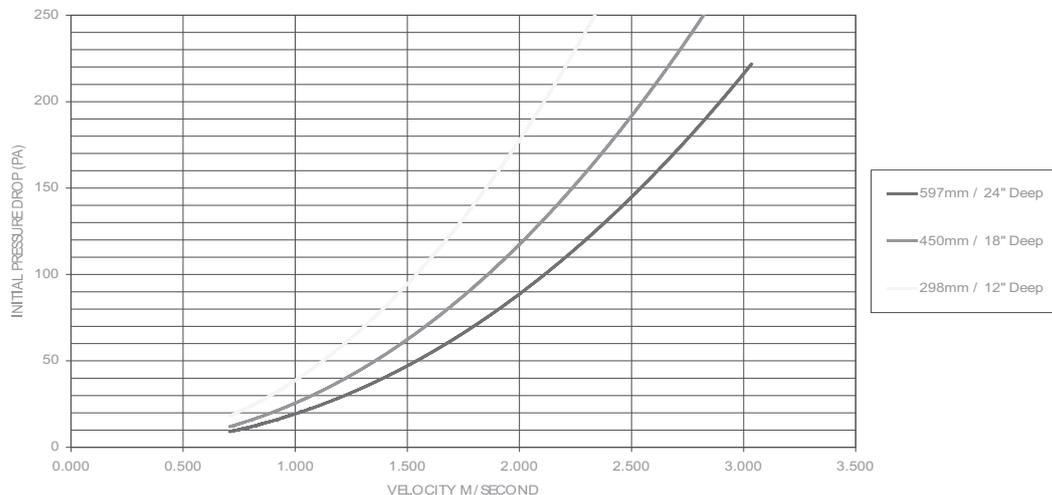
Multicarb Cells STANDARD SIZES



| 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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LINEAR VELOCITY M/SECOND V'S PRESSURE DROP
MULTICARB ACTIVATED CARBON CELLS



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

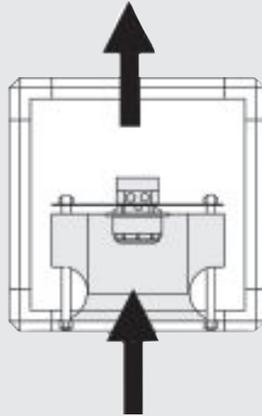
Specification

- 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.

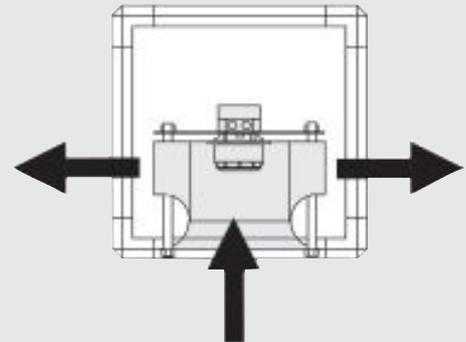
Technical data

| 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 | 400V | 230V | 400V | | | single phase | | three phase | | 230V | 400V |
| | | | | | kW | kW | A | A | | | 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 |

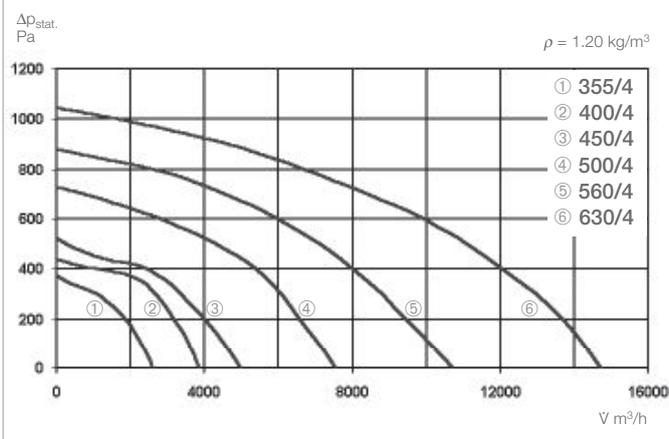
Straight through



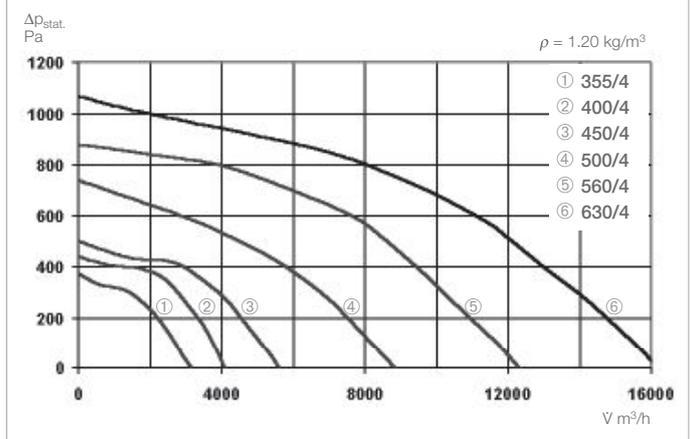
Side outlet



Straight through



Side outlet



Selection table

Straight through

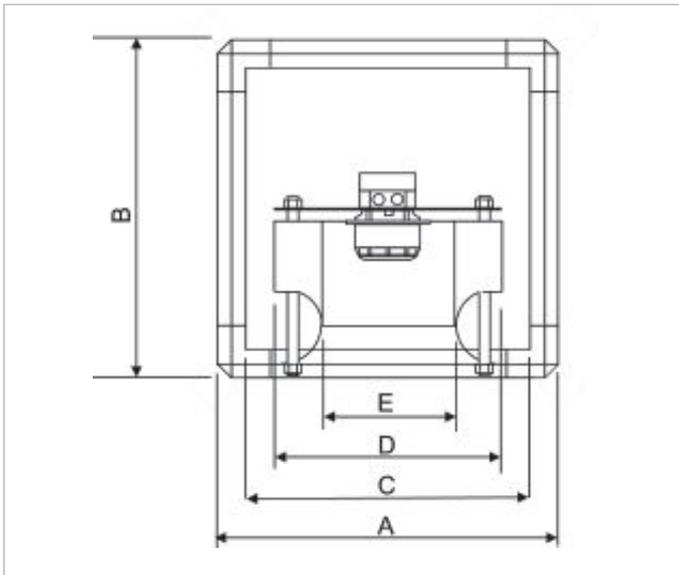
| Size | Model | Electrical supply | Air volume flow m³/s against static pressure Pa | | | | | | | | | | | | |
|------|------------------|-------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | 0 | 50 | 100 | 150 | 200 | 250 | 300 | 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 | 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 | 58 | 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.

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.

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.

PRODUCT RANGE

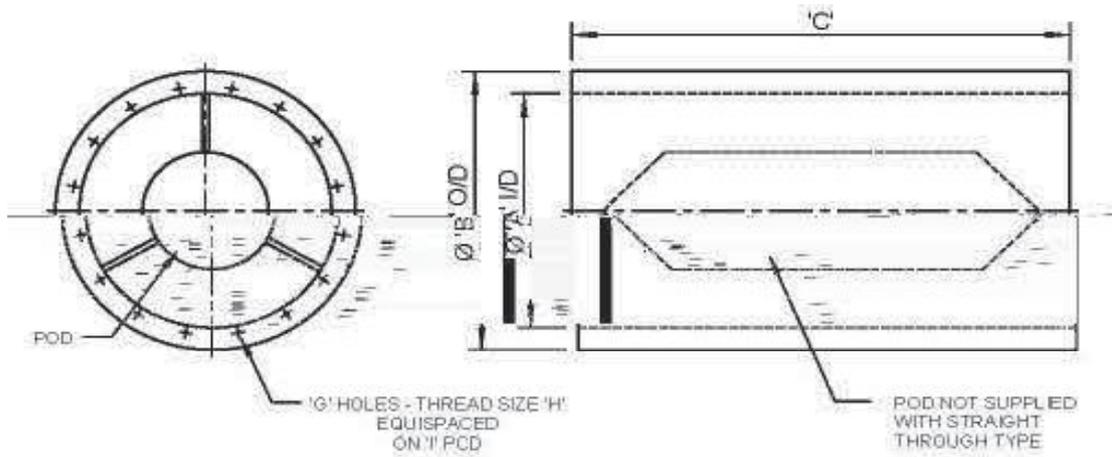
- Long Cased Axial
- Bifurcated Axial
- Plate or Short Cased Axial
- Axial Impellers
- Smoke Extract
- Boxed Centrifugal
- Propeller
- Flameproof (Hazardous Area)
- Roof Mounted
- Portable

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

Attenuator insertion loss data

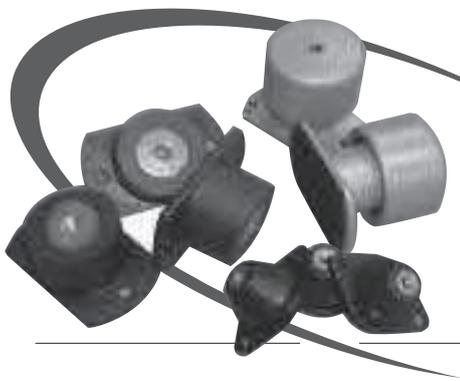
| | | Straight Through Type (no pod) | | | | | | | | Pod Type | | | | | | | |
|-----------|-------------------|--------------------------------|-----|-----|-----|----|----|----|----|--------------------------------|-----|-----|-----|----|----|----|----|
| Dia mm | Length [x Dia] | Octave band mid frequencies Hz | | | | | | | | Octave band mid frequencies Hz | | | | | | | |
| | | 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 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 |



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)

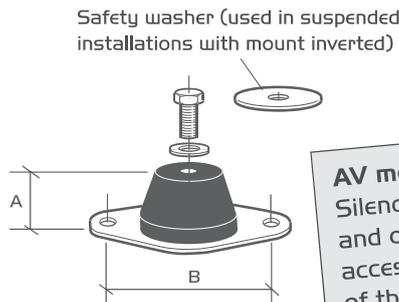


Figure 2. NAV 6 (Resilient Rubber)

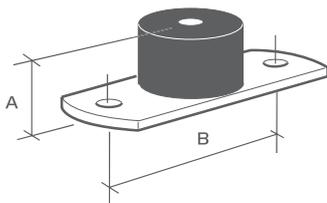
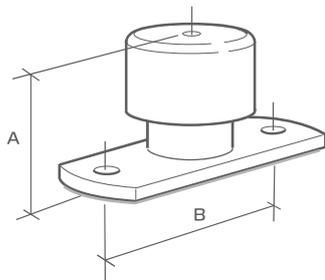


Figure 3. NAV 49 to NAV 58 (Spring)



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.

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.

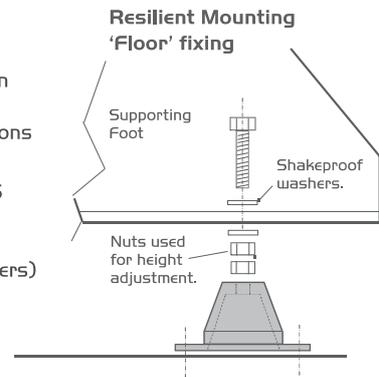
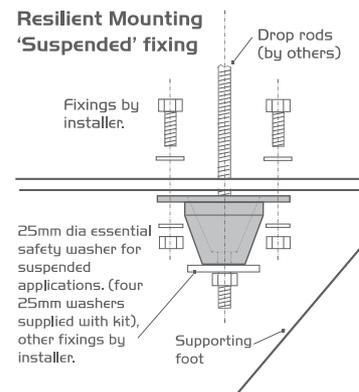


Figure 5.



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 |



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