EXTRACTOR DUCTING SYSTEM

Duct Design:

The 400mm diameter stainless steel duct must have a smooth internal surface and should not contain any acute right-angle bends but easy bends to ensure the smooth flow of air through the ductwork at each change of direction of the duct. The ducting should be leak free to prevent air ingress or discharge of odours. The ducting should be well insulated to minimize heat loss, thereby maximising thermal buoyancy of the discharge.

Note: The flue should be positioned and fixed to minimize the generation and effects of vibration and noise. Such fixings should include anti-vibration mounts and incorporation of flexible couplings, silencers, etc, in the ductwork to control noise.

Grease Filters:

Washable metal grease filters are to be sited directly over the cooker range. A grease trap is to be incorporated into the extractor hood. The cooker canopy should be sufficiently long and wide to cover all cooking ranges and should be of sufficient height to enable easy working on the ranges whilst low enough to trap all odours/steam generated by the cooking. The canopy should be constructed from Stainless Steel to enable easy cleaning and the grease filters should be cleaned daily. Given the comparative cheap cost of these filters, it is recommended that a second set of filters is obtained and rotated daily, so that one set is always in use whilst the second set is being cleaned.

The velocity of gases through these filters to enable sufficient residence time to optimize grease removal whilst enabling 25-30 changes per hour of the kitchen air. Two existing windows at the rear of the shop are acting as ventilation air inlets to the kitchen. These windows will allow air ingress but preventing direct release of odours out of the kitchen.

Pre-filters:

Disposable fabric-based Pre-filters consist of a course filter to remove larger particles which may have got through the grease filters, followed by a fine filter. They are intended to protect the relatively expensive carbon filters, thus increasing their life. Coarse and fine pre-filters should be changed every month. The pre-filters and carbon filters can be placed inside or outside the building and are located before the fan, however, they must be easily accessible for cleaning/maintaining.

Carbon Filters:

The activated carbon filtration shall be located at a sufficient distance along the duct run to prevent the cooking heat from reducing the efficiency of the filtration, however, heating may need to be added when there is a high moisture content as excess moisture can reduce the effectiveness of the filters (defined conditions for optimum efficiency is an air temperature not exceeding 40°C and a maximum relative humidity of 60%). The unit shall incorporate 100Kg of carbon granules per 1,000 cubic feet per minute of air flow with minimum residence time of 0.3 seconds.

Carbon Filters must be changed on a regular cycle, which will depend on the level of kitchen use and the manufacturer's instructions. Typically, activated carbon filters shall be replaced every six months, either by disposal or return to the manufacturer for rejuvenation. It is recommended therefore that consideration be given to obtaining a service contract with the manufacturers in order to ensure that regular cleaning and maintenance is carried out.

Extraction Motor:

The extraction motor shall be 400MM MAXFAN COMPAC externally located on the rear wall above the side door at ground-first floor level, with anti-vibration mounts. The motor shall be correctly rated for this application and at the correct speed/flow rate to achieve optimum performance of the filtration. The extraction motor shall be cleaned and maintained in accordance with the manufacturer's specification. The motor controller shall be located in the kitchen and be of either a two- speed or variable speed design, adjusted so that the speed settings correlate to and achieve the optimum flow rates of the odour control.

Noise control shall be implemented, where necessary, by either in-line acoustic absorbers or external acoustic insulation. If in-line absorbers are used, the effect of these on flow characteristics shall be taken into account.

Dispersal:

The duct stack should be taken straight up the rear of the kitchen. Wire mesh should be provided at the terminus to prevent pigeons or birds nesting or gaining access. The duct termination shall be designed to achieve a vertical efflux velocity of 15 meters per second).

Noise Control:

The following points should be taken into account to minimize vibration and noise emissions:

- The motor and its installation should be as a complete package for this task. Fans generally produce less noise if operated at the optimum efficiency relative to their characteristics with the correct selection of duct size and type;

- Motor should be located within the ground floor kitchen, that is, on side walls to reduce the noise transmission.

- Machinery may need to be mounted on properly designed vibration isolators and ducts can be isolated from the structure with neoprene or spring hangers with flexible connectors between ducts;

- The recommended maximum supply and return velocities for grilles and terminals should be applied.

- Silencers to be provided, both upstream and downstream to prevent radiation of fan noise through the ductwork. These should be fitted as close to the fan as possible (but

not so close as to lead to a non-uniform air-flow velocity across the face of the silencer). Where this is not possible, the intervening ductwork should be acoustically lagged.

Conclusions:

The Maxfan Compac by Flakt Woods is supplied with an Inverter speed controller.

The same Compac fan can be used where only single-phase supply (240volts) is available or for the first time where Three Phase supply is available, (standard package 1Phase only, please ask for 3Phase options) both options are fully speed controllable via inverters. The use of inverters for speed control offers true energy and efficiency savings.

A typical application where this fan is commonly used is in the catering industry where a high level of filtration is required, usually the result of fitting odour control via Pre and Carbon Filters*.

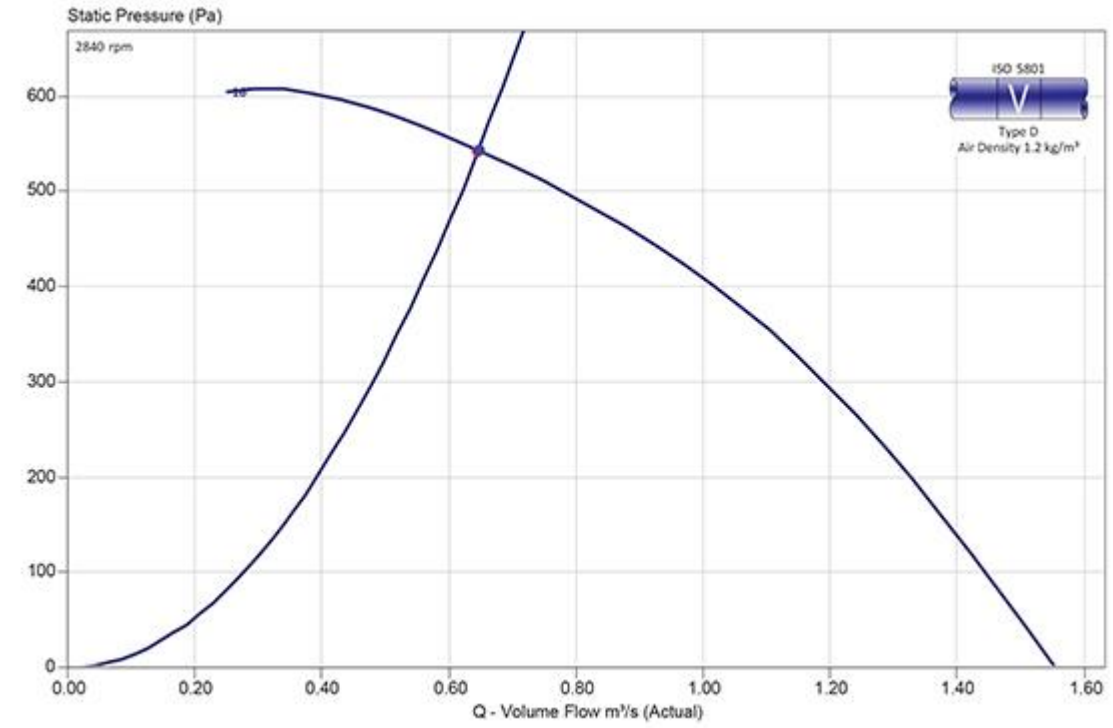
The build quality and reliability are to be met by the followings:

- Supplied fully assembled
- Fully speed controllable via inverter
- Can be used in any non-hazardous environment
- Suitable in temperatures from -40°C to 80°C
- Low to high air volumes
- Low to high static pressures
- Available sizes 315mm – 630mm from stock

The Casings are spun sheet steel, then hot dipped galvanized to give a finish highly resistant to corrosion and can be mounted externally and internally. The impeller (the bit that goes around and moves the air) is manufactured die cast aluminium. The motors are totally enclosed with class F insulation with protection to IP55.

*High pressure systems can also consist of duct size restrictions, an unusual amount of ducting including a high number of bends, other forms of filtration such as Heppa Filters or Electrostatic filters. We can check the suitability of this fan for your application if required, please contact by any means you feel comfortable with and we'll offer free advice

Performance:



Technical Details:

Fan Code	40 MaXfan Compac
Fan Diameter / Size	400 Size / mm
Fan Speed	2840 rpm
Velocity	5.1 m/s
Blade Angle	16°
Installation Type / Form of Running	D / AB
Fan Casing	Long
Requested Duty	0.65m³/s @ 542 Pa (static)
Outlet Dynamic Pressure	16 Pa
Duty Shaft Power	0.694 kW
Max Shaft Power	0.737 kW
Total Efficiency	52.1 %
Motor Frame	80 [Class F]
Motor Rating	1.32 kW [IE2]
Full Load Current	4.71 A
Starting Current	25.5 A
Motor Mounting	Pad
Electrical Supply	220-240 Volts 50 Hz 1 Phase
Start Type	DOL
Motor Winding	Standard
Enclosure	Standard All
ErP [FMEG] Rating	N 62 (ErP Compliant 2015)
ErP [FMEG] Target	N 58
FMEG Blade Angle [Range]	0° [0° - 0°]
Measurement Category	D (Total)
VSD	N
Fan + Motor Efficiency	55.8% (1.29 m³/s @ 375 Pa)
Motor Input Power (ErP)	0.870 kW
SFP value	1.35 W/(l/s) @ Requested Duty
Power from mains	0.87 kW
Energy Consumption	2622 kWh (3000 h/year)
Running Cost / Year	£315
Air Density	1.2 kg/m³ / 20 °C / 0 m / 50% RH
Smoke Venting	Non Smoke Venting
Product Number	EJ413456

Performance data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with ISO 5801 and is specifically applicable for Ducted installations. When an electronic controller is incorporated, enhanced motor noise can occur - particularly when the operating speed is well below maximum. FWL therefore recommend using an auto transformer speed controller for noise sensitive applications. Bifurcateds are Erp exempt when used continuously at >100C. They are not for use in the EEA at lower temperatures.

The MaXfan Compac includes a preprogrammed inverter drive to operate via 1 phase supply, offering full speed control and optimised performance.

Acoustic data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with BS 848 Pt 2, 1985 / BS EN ISO 5136 under Ducted conditions. The single figure provided is the overall Inlet sound pressure level at the specified distance, under spherical, free field conditions.

Acoustic figures for adjusted running speeds have been interpolated and are for reference only.

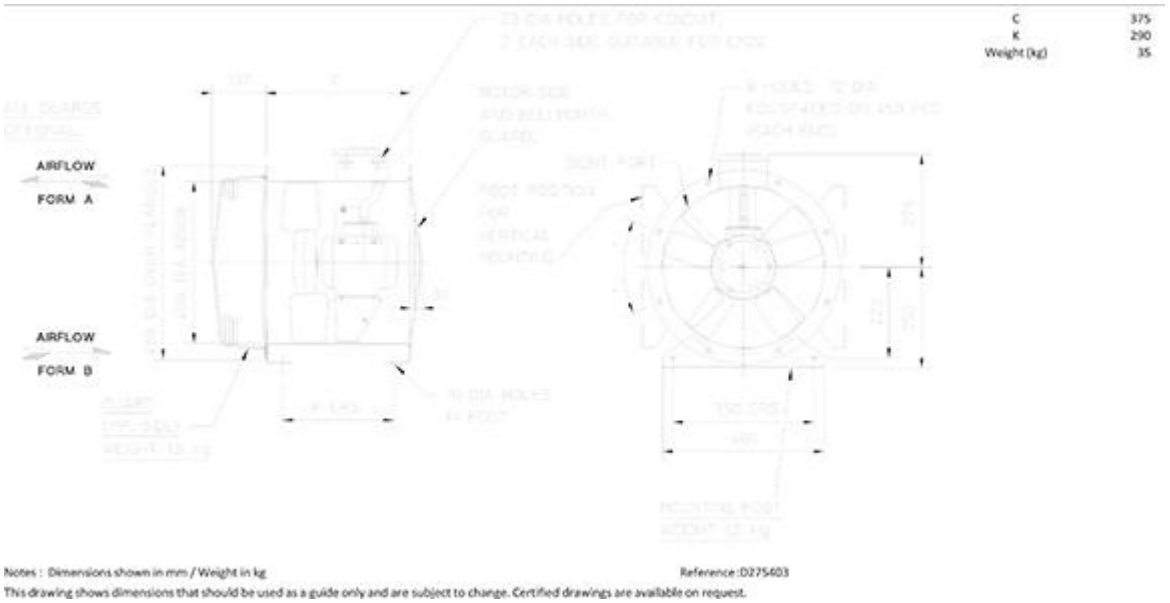
Terms and Conditions:This offer is made subject to the terms and conditions detailed on the accompanying letter.

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	84	85	91	88	88	85	82	77	95	71
Outlet*	86	86	94	89	89	86	83	78	97	73
Breakout*	76	71	74	68	63	57	58	55	79	49

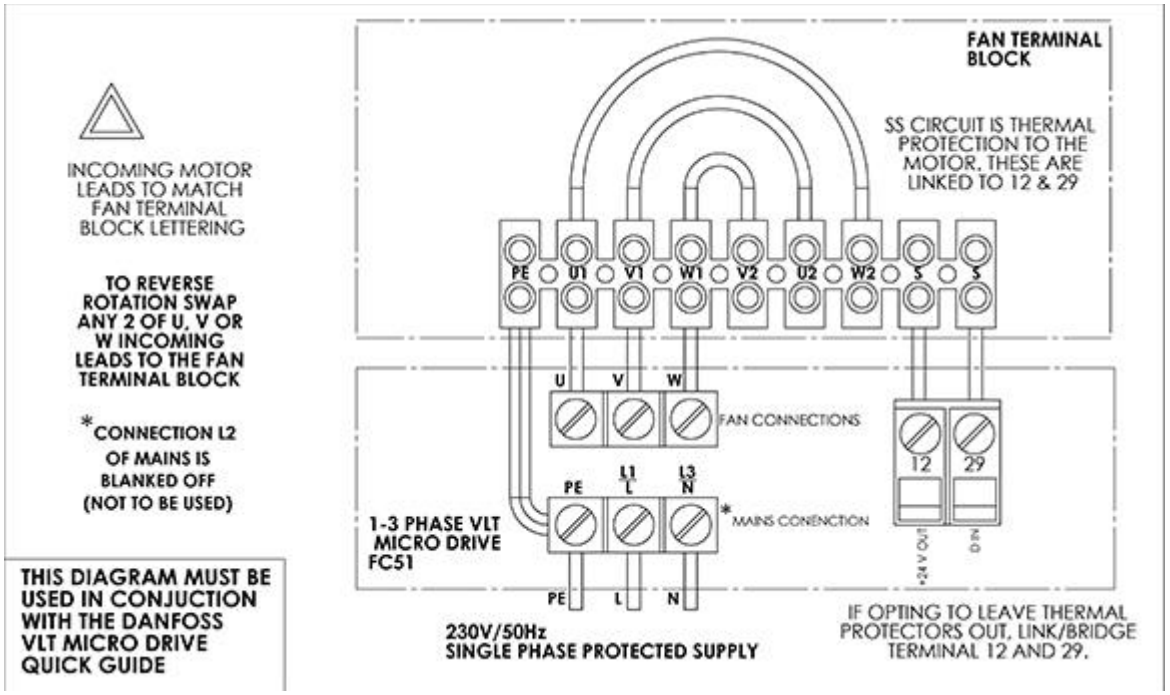
* Lw dB re 10^{-12} W ** dBA re $2x10^{-5}$ Pa

Sound data at requested duty.

Dimensions :



Wiring Diagrams :



400mm Mounting Feet:

Supplied in pairs 400mm Mounting Foot, used to fit directly to the fan as part of a full ancillary package The Mounting Foot can be used to mount the fan in the horizontal or vertical position Usually used in conjunction with Anti Vibration Mounts Can also be used to fit directly to Silencers with or without Anti Vibration Mounting Feets.

CDA 400 x 1D straight through Silencer
400mm dia x 400mm long straight through silencer (generally reduces a fan noise level by 7 – 10dB (A)* Can be supplied to either bolt directly to any manufacturer of cased axial or with spigots to mount in line with ducting. The addition of this silencer to a system will act in the same way a silencer does on a car.

400mm Louvre Shutter
A Louvre Shutter is a gravity type shutter which can be used to terminate and weather extract systems. When the fan is running the plastic blades will open allowing the air to be extracted from the system, and when the fan is not running will be closed, this helps to prevent back draughts and water ingress. The shutter is commonly used to terminate.

400mm dia Flange– suits any manufacturer of fans
400mm dia Flange used to bolt directly to any manufacturer of Fans, as part of a full ancillary package or for the fan to mount inline in ducting.