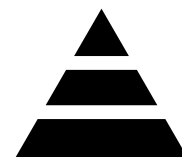


Odour Management Plan

67 Market Street, Westhoughton, Bolton BL5 3AG
and 1A Wood Street BL5 3AE

Prepared on March 2023
Prepared by:
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Architecture & Construction

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1. INTRODUCTION

Delta Tech have been commissioned by the Applicant to provide an Odour Management Plan to accompany a Planning Application for new shop front to provide new access for restaurant on upper floor and ground floor unit at 67 Market Street, conversion of 1A Wood Street into restaurant (E use class) with installation of extraction flue system to rear and joint use of upper floor at 67 Market Street with 1A Wood Street. New signs on front elevation..

The planning application proposes a new extraction flue system and seeks to identify a scheme for the extraction and treatment of fumes and odours at the site and in parallel to this provides an Odour Management Plan which would adhere to the fumes/odours not being detectable at the site boundary.

2. ODOUR ASSESSMENT

2.1. Introduction

This odour assessment relates to the potential future odour emanating from any kitchen extraction system associated with the change of use development, and the potential odour impacts on any sensitive receptors in close proximity to the extract flue.

2.2. Nature and Effect of Odour

Odour is perceived by our brains in response to chemicals present in the air we breathe. Odour is the effect that those chemicals have upon us. Humans have sensitive senses of smell and they can detect odour even when chemicals are present in very low concentrations. Most odours are a mixture of many chemicals that interact to produce what we detect as an odour.

Different life experiences and natural variation in the population can result in different sensations and emotional responses by individuals to the same odorous compounds. Because the response to odour is synthesised in our brains, other senses such as sight and taste, and even our upbringing, can influence our perception of odour and whether we find it acceptable, objectionable or offensive.

2.3. Assessment Methodology

The assessment of odour takes on the following aspects:

- A qualitative assessment of proposed odour emissions from the change of use development;
- An assessment taking into account the nature of the premises;
- The height and position of any proposed flue;
- The recommended exit velocity from the flue; and
- The distance between the proposed flue and the potential odorous emissions and the distance to the sensitive receptor.

2.3.1. Guidance on Control of Odours from Kitchens

The Department for Environment Food and Rural Affairs (DEFRA) originally published guidance¹ (now withdrawn) on the control of odours from kitchens. That guidance has been subsequently updated by 'Control of Odour and Noise from Commercial Kitchen Exhaust Systems' (EMAQ, July 2018)

Although the guidance is not statutory, it provides very useful information on best practice techniques for the minimisation of odour nuisance from kitchen exhaust systems. This source of guidance and ACCON's own experience form the basis of the assessment to determine whether nearby occupiers of existing residential properties would consider that odour emanating from the kitchen extract flue is acceptable or not.

2.3.2. General Principles in Controlling Odour

The guidance is generally used for premises where food is cooked for patrons on or off the premises and where a kitchen is used to prepare and cook food. In these instances, a kitchen canopy extract system, are invariably present.

The main purpose of a kitchen canopy is to extract excess heat, steam, fats, smoke and odour arising from cooking processes. Removal of these unwelcome by-products of kitchen activity helps to achieve a reasonably comfortable and safe working environment, protect the working environment, as well as preventing the spread of the products from the kitchen area to other parts of the building.

Odours from cooking are contained both within the solid, liquid and gaseous material which is extracted by the kitchen canopy, and these different phases generally require different abatement techniques to reduce levels of odour to those levels which are acceptable to those in the vicinity. The extent to which any odour mitigation is required is dependent on the type of foods being prepared and cooked.

Commonly the kitchen extract canopy will contain the first line of odour control through the incorporation of coarse grease filters, which take out the largest grease particles from the extracted air stream. Such coarse grease filters tend to be a common feature of almost all kitchen canopy systems.

The type and levels of odour control required downstream of the canopy is very much dependent on a number of factors. The principle ones are:

- Type of food prepared. This is probably the most dominant factor as the type of food, and particularly any spices used, dictates the chemical constituents present in the exhaust air;
- Size of the cooking facility. The number of covers; and
- Types of cooking appliances used. This dictates the level of fat, water droplets and temperature within the ventilation air.

The guidance includes two Tables which classify the odour and grease content of extract air according to the general cooking type and equipment used. These are reproduced in Appendix 3 (Table 2A and Table 2B). The information, in Appendix 3, has been used in his report to carry out the odour risk assessment in respect of the consented change of use development.

2.4. Odour Impact Assessment

Based on the observed location of the proposed external extraction system located to the rear side and running along the elevation wall to the ridge, this odour impact assessment and Odour Management Plan has been undertaken in accordance with the EMAQ guidance 'Control of Odour and Noise from Commercial Kitchen Exhaust Systems'.

2.5. Risk Assessment

The guidance provides a means of risk assessing the impact of any catering establishment and proposed and existing uses. The key elements of the method are reproduced in Appendix 3. The method relies on scoring the proposal on four different aspects:

- Dispersion – where the extract vents to atmosphere are in relation to the building to which the vent is attached;
- Proximity of receptors – the location of the nearest residents;
- The kitchen size – number of covers, i.e. level of activity; and
- Cooking type – based on grease and odour loading.

The level of odour which is created by a premises will depend on the size of kitchen and type of cooking. These can be determined using categories which have been set out in the guidance and are replicated in Appendix 4.

The scores for each aspect are summed to derive an overall significance score, an impact risk, and a statement about the odour control requirement. The guidance has been utilised where possible to determine the risk of odour nuisance from the proposed change of use development, without any additional odour abatement in place.

The risk assessment provided in Table 2.1, is a worst-case scenario.

Table 2.1: Odour Risk Assessment – 67 Market Street & 1A Wood Street

	Descriptor	Score	Impact Risk	Odour Control Requirement
Dispersion	Good	5	Low	Low Level Odour Control
Proximity of Receptors	Close	10		
Size of Kitchen	Small	1		
Cooking Type (Odour & Grease Load)	Medium	1		
TOTAL		17		

* Estimated, based on the details provided.

For the proposed flue extract system, it would be discharging high level at 10-15m/s (Good, Score 5). There are receptors within 20m of the proposed flue extract (Close, Score 10). The kitchen will be small, less than 30 covers/small kitchen (Small, Score 1) . The food cooked on site will be Mediterranean using electric as fuel, the cooking type (odour and grease loading) is classed as Low (Score 1). The results of the overall assessment are potentially Low.

2.6. The Odour Management Plan

Section 2.5 has quantified that as a worst case for the consented change of use development (provided the recommendations are taken into account) there is deemed to be a 'Low' risk of potential nuisance and ordinarily a Low level of odour mitigation would be recommended.

2.6.1. Proposed Ventilation and Extraction System

The proposals are for the installation of an external high-level flue extract to the rear section of the property. Refer to plans in Appendix 2.

The proposed system is electric ovens etc using layers of carbon filters.

The fan is located above the oven, on the flue, designed to efficient and low noise for electric grills and located within an acoustic insulation housing. It is proposed a fine carbon filter is installed to (carbon filter with a 0.2 – 0.4 residence time) to prevent any form of odour to be captured under very heavy use which is able to stand high temperatures and easily accessible for visual inspection and cleaning.

2.6.2. Maintenance Programme (Type, Frequency and Regime)

To minimise the risk of complaints, it is recommended that:

- A visual inspection of the ventilation system be carried out at least once a week. All metal surfaces should be checked to ensure that there is no accumulation of grease or dirt and that there is no surface damage;
- Cooker hoods and grease filters should be cleaned on a daily basis;
- Baffle type self-draining filters and collection drawers should be cleaned weekly, as a minimum. The cleaning period for mesh filters should be at least twice a week;
- Cleaning period for extract ductwork should as follows:

Use No. hours use per day Minimum Cleaning Interval

Heavy use 12 – 16 Every 3 months

Moderate Use 6 – 12 Every 6 Months

Light Use 2 – 6 Annually

Based on the information provided, it is likely that the premises will be of Light to Moderate Use, and should be cleaned at least every 6 months;

- Periodic 'deep hygiene cleaning' should be undertaken by a specialist contractor. All accessible main ductwork runs and branches, including fitted equipment should be inspected and cleaned;
- All fans are to be maintained on a regular basis as recommended by the fan manufacturer; and
- Ventilation grilles, where fitted should have easily removable cores to facilitate cleaning.

Recommendations for maintenance of odour control system

For a system employing fine filtration and carbon filtration;

- Change fine filters every two weeks
- Change carbon filters every 4 to 6 months

For a system employing ESP and other in line abatement systems:

- Clean every 2-6 months

Daily cleaning keeps the filters working at their optimum efficiency and will greatly reduce the number of service visits required throughout the year.

It will be important that the odour control methods are fully implemented and additionally, that the proposed OMP management measures and frequency of servicing is complied with. With respect to the servicing and maintenance regime, audit and service records should be maintained and made available to the Local Authority on demand.

3. CONCLUSIONS

With respect to odour, it has been identified that providing that the recommendations in this Odour Management Plan are taken into account, there should not be a loss of amenity at the existing residential receptors in the vicinity of the extraction flue and as long as the systems recommended in the OMP are implemented, this would consist of using the “best practicable means” and would prevent statutory nuisance occurring.

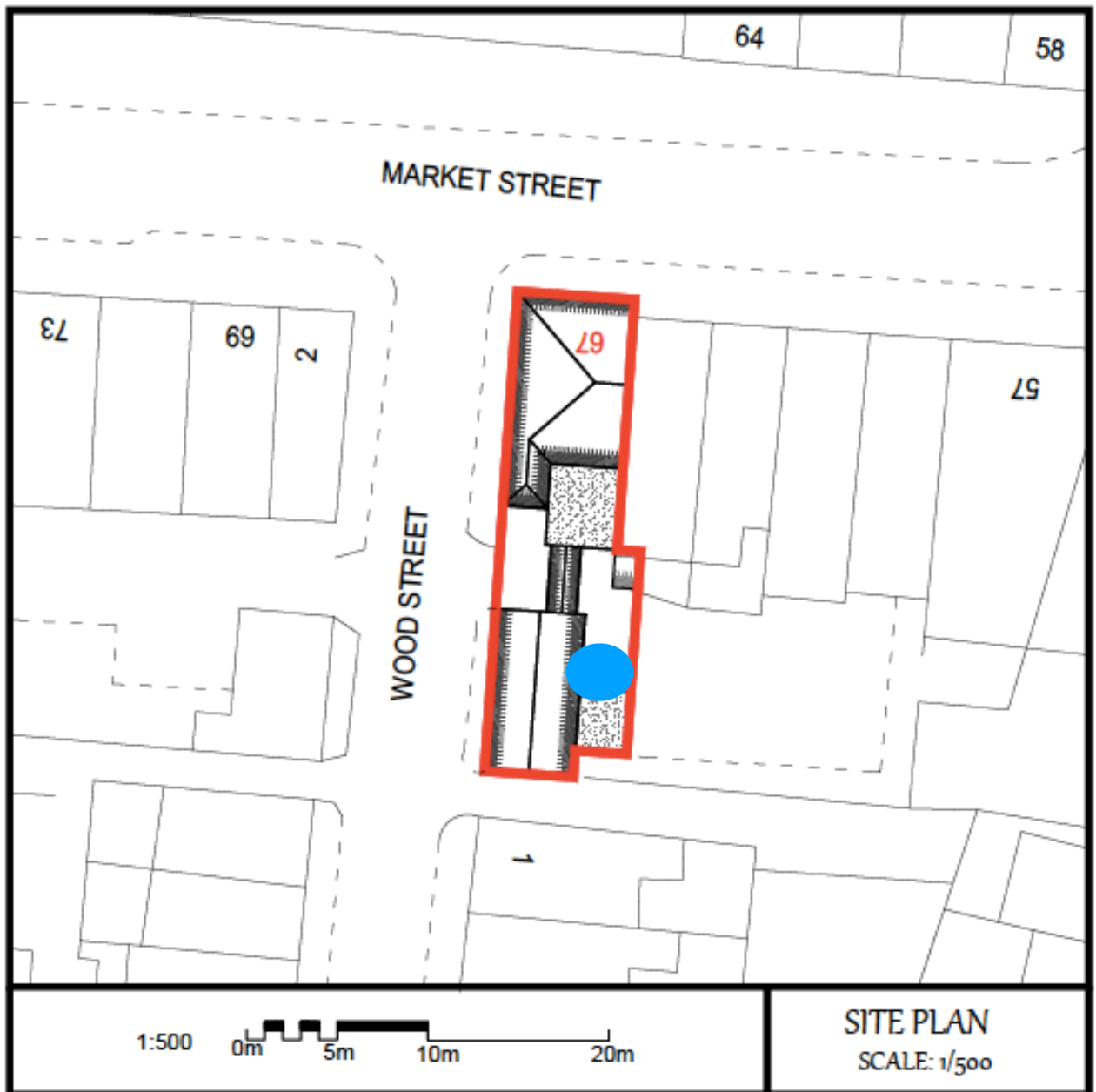
As long as the proposed extraction system is properly maintained on a regular basis, it is highly unlikely that odour would become an issue in the future.

Appendix 1
Site Layout Plan

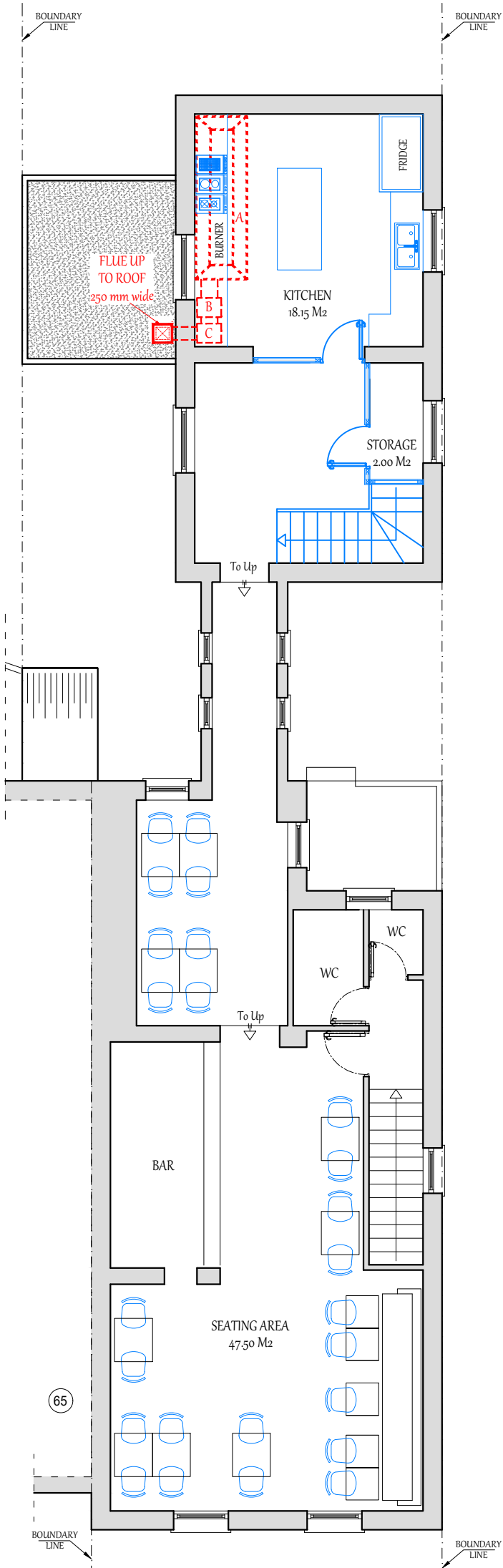
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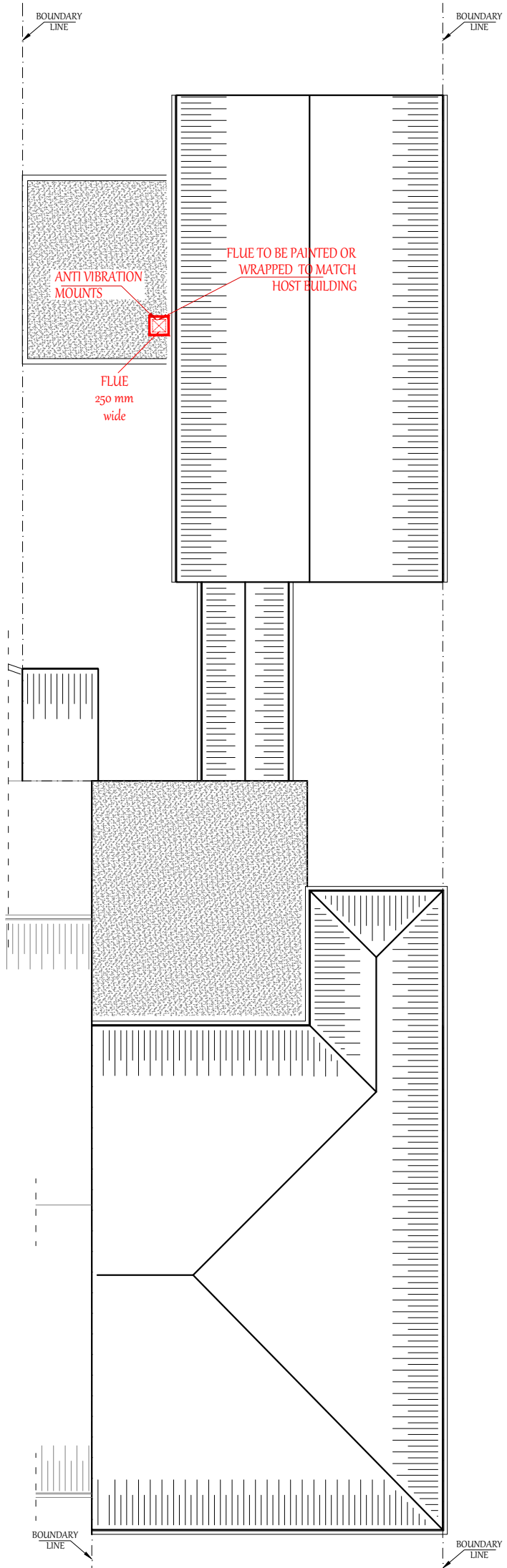
Flue Location:



Appendix 2
Proposed Flue and Ducting Location



PROPOSED FIRST FLOOR PLAN
SCALE: 1/100 @A3



PROPOSED ROOF PLAN
SCALE: 1/100 @A3

LEGEND

- EXISTING WALL
- PROPOSED PARTITION WALL

KEY TO FIGURE

- A. COOKER/HOOD
- B. FILTER
- C. MOTOR

PROPOSED FIRST FLOOR AREA :135.00 m²



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67 MARKET STREET
WESTHOUGHTON BOLTON
BL5 3AG

PROPOSED
-FIRST FLOOR PLAN
-ROOF PLAN

PROJECT: PLANNING

SCALE: 1/100 @A3

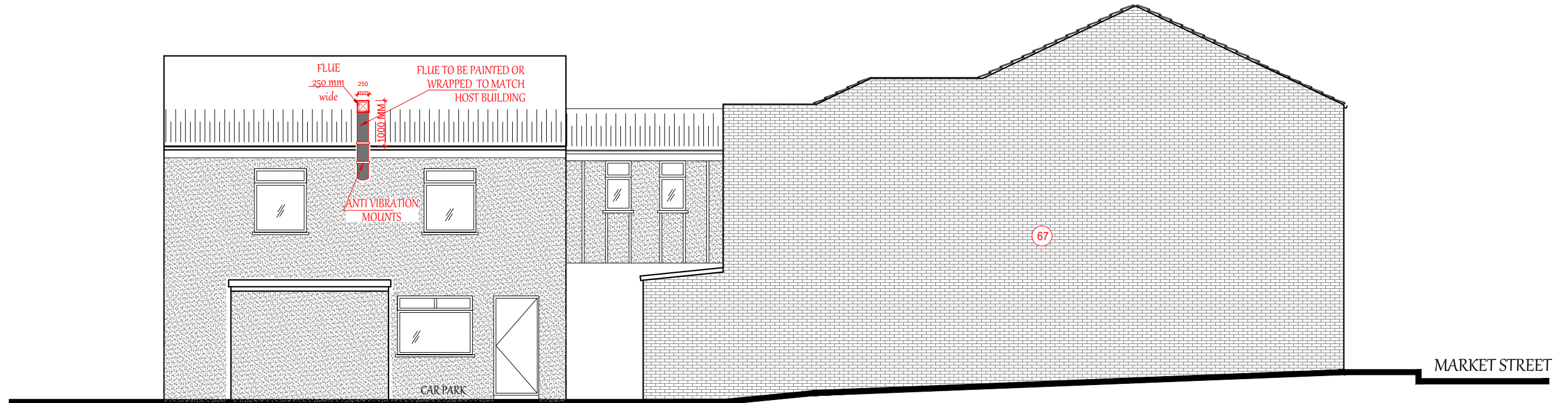
REF. NO :MRK67/23/07

DATE: SEP. 2023

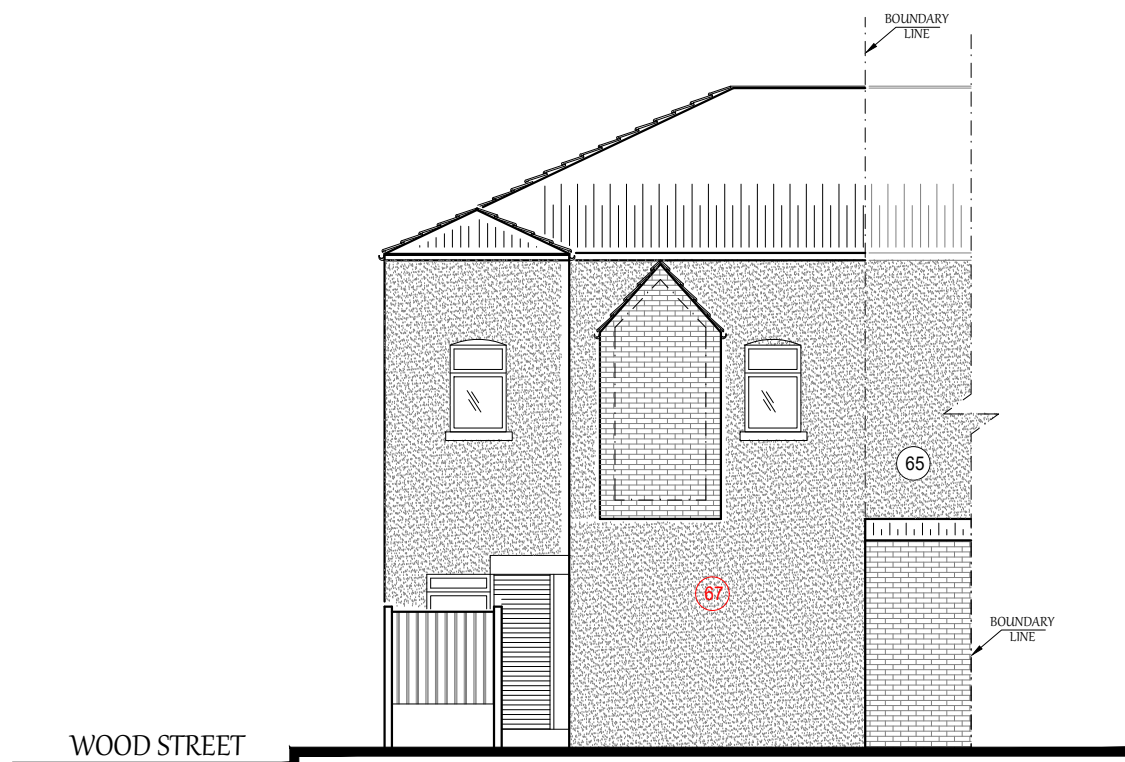
DRG BY: B.OZDEMIR

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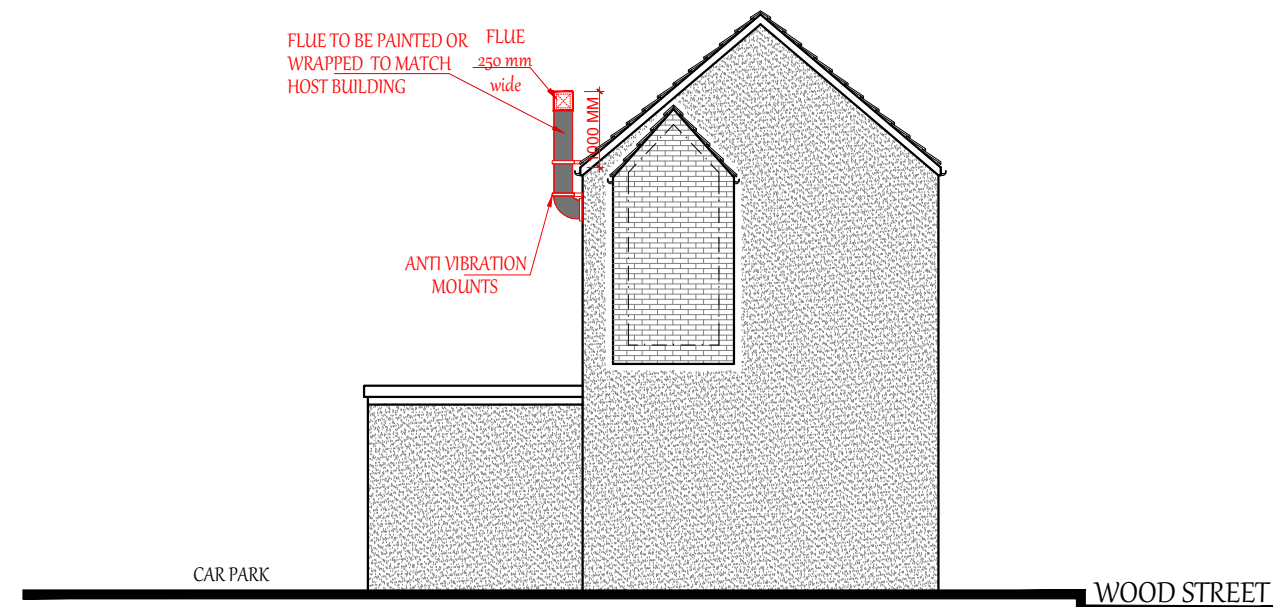




PROPOSED SIDE ELEVATION
SCALE: 1/100 @A3



PROPOSED VIEW 1
SCALE: 1/100 @A3



PROPOSED VIEW 2
SCALE: 1/100 @A3

Appendix 3
Classification of Odour and Grease Content of Extract Air from
Commercial Kitchens

Table 2A: Table detailing the grease and odour content of various types of food

Catering Establishment	Description	Odour Content				Grease Content			
		Low	Moderate	High	V. High	Low	Moderate	High	V. High
Tea shop		x				x			
Pizza	Herb		x				x		
Steakhouses	Fat		x				x		
French	Herbs/ garlic		x				x		
Italian	Herbs/ garlic		x				x		
Most pubs Fat	Fat		x				x		
Chinese	Ginger, spices, oil		x					x	
Japanese	Spices, oil		x					x	
Cantonese	Spices, oil		x					x	
Indian	Spices, oil			x				x	
Thai	Spices, oil			x				x	
Vietnamese	Spices, oil			x				x	
Kebab	Fat cooking meat			x				x	
Fried Chicken	Oil, cooking meat				x				x
Pubs (fried)	Oil, cooking meat				x				x
Fish & chip	oil				x				x
Fast food, burger	Oil, cooking meat				x				x

Table 2B: Table detailing the grease & moisture content of various cooking appliances

Cooking appliance	Grease loading			Moisture content		
	Light	Medium	Heavy	Light	Medium	Heavy
Cooking pots	x					x
Bains Marie	x					x
Steam ovens	x					x
Pizza ovens		x			x	
Bratt pans		x				x
Oven ranges		x			x	
Flat top grills		x			x	
Chip fryers		x			x	
Salamanders		x			x	
Charcoal			x		x	
Gas fired open grills			x		x	
Char boilers			x		x	
Chinese wok ranges			x			x

Appendix 4
EMAQ Odour Impact Risk Assessment Methodology

Odour control must be designed to prevent odour nuisance in a given situation. The following score methodology is suggested as a means of determining odour control requirements using a simple risk assessment approach.

Impact Risk	Odour Control Requirement	Significance Score*
Low to Medium	Low Level Odour Control	<20
High	High Level Odour Control	20-35
Very High	Very High level Odour Control	>35

*based on the sum of contributions from dispersion, proximity of receptors, size of kitchen and cooking type.

Criteria	Descriptor	Score	Details
Dispersion	Very Poor	20	Low level discharge, discharge into courtyard or restriction on stack.
	Poor	15	Not low level but below eaves, or discharge at below 10m/s
	Moderate	10	Discharging 1m above eaves at 10-15m/s
	Good	5	Discharging 1m above ridge at 15m/s
Proximity of receptors	Close	10	Closest sensitive receptor less than 20 m from kitchen discharge
	Medium	5	Closest sensitive receptor between 20-100m from kitchen discharge
	Far	1	Closest sensitive receptor greater than 100m from kitchen discharge
Size of Kitchen	Large	5	More than 100 covers
	Medium	3	Between 30-100 covers
	Small	1	Less than 30 covers
Cooking Type (odour & grease loading)	Very High	10	Pub (high level of fried food), fried chicken, burgers or fish and chips
	High	7	Kebab, Vietnamese, Thai or Indian
	Medium	4	Cantonese, Japanese or Chinese
	Low	1	Most pubs, Italian, French, pizza or steakhouse

Appendix 5

Specification for proposed motor, flue and Carbon Filters

Sitesafe Carbon Filters



We manufacture Sitesafe carbon filters, these innovative carbon units measure 594x196x597mm, three combining to 594x594x597mm, directly replacing our original carbon blocks whilst providing exactly the same filter performance as an existing full size cell.

Their advantage is that they only weigh 18kg each against the 68kg of our original blocks. This takes the strain out of fitting and servicing, allowing only one engineer to complete the task where two had been previously required.

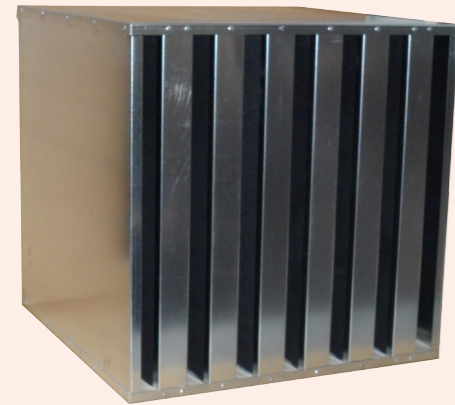
Our Sitesafe carbon filters use panels of activated carbon to remove the malodorous gases within the commercial kitchen extract duct through the process of chemical adsorption. By installing our ESP units before our Sitesafe filters, the carbon life span is greatly increased, allowing it to nullify malodours at optimum efficiency for much longer.

Please see below for the recommended minimum dwell times required for different applications and scale up accordingly.

It should be noted that filtration performance will be improved by increasing the dwell times applied.

Will require two people plus lifting gear to carry and install.

Safe for one person to carry. No special lifting gear required.



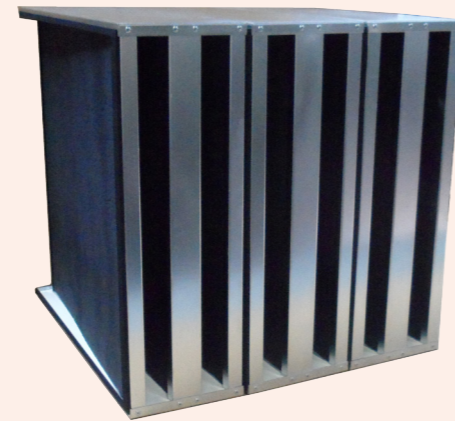
Carbon PA242424

Size 594x594x597
Gross Weight 68.20kg
Carbon Weight 50.00kg
Rated Airflow 3600m³/hr*
Pressure Drop 120Pa



Sitesafe PA240824

Size 594x196x597
Gross Weight 17.95kg
Carbon Weight 16.6kg
Rated Airflow 1200m³/hr*
Pressure Drop 120Pa



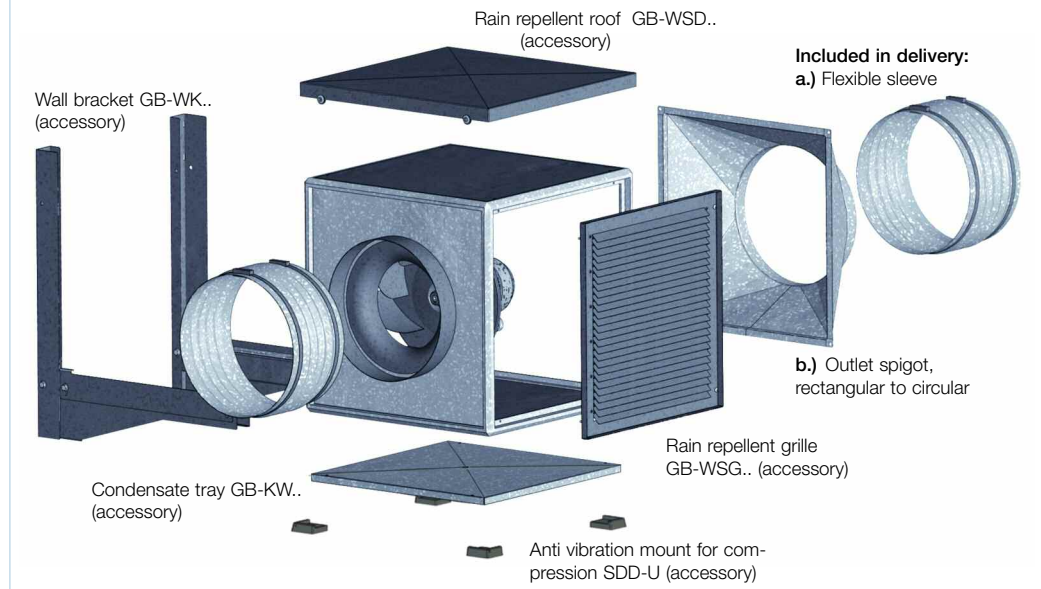
Sitesafe 3 x PA240824

Size 594x594x597
Gross Weight 53.85kg
Carbon Weight 50.00kg
Rated Airflow 3600m³/hr*
Pressure Drop 120Pa

Application	Recommended Dwell Time	Grade
Cooking - Low Odour, Tea Shop, Canteens	0.1 to 0.2 Seconds	Carbon grade Enhanced for improved performance for light catering odours
Cooking - Moderate Odour. Pizza, Steak House, French, Italian, Pubs, Chinese, Japanese, Cantonese	0.2 to 0.4 Seconds	Enhanced Carbon grade suitable for many applications 65% Minimum CTC
Cooking High Odour, Indian, Thai, Vietnamese, Kebab	0.4-0.6 Seconds	Enhanced Carbon grade suitable for many applications 65% Minimum CTC
Cooking Very High Odour. Fried Chicken, Pubs with large fried food turnover, Fish and Chip Shops, Fast Food / Burgers	0.4-0.8 Seconds	Enhanced Carbon grade suitable for many applications 65% Minimum CTC
Reduction of Kerosene Exhaust fumes	0.1 to 0.2 Seconds	General Purpose Activated Carbon
Reduction of Ozone	0.1 to 0.2 Seconds	General Purpose Activated Carbon
Reduction of Diesel Fumes, including H ₂ S, SO ₂ , NO _x , HCl	0.2 Seconds	Carbon Museum,Archive, Café Directive: SO ₂ SOX NO ₂ NOX Removal
Museum and Archives	0.2 Seconds	Carbon Museum,Archive, Café Directive: SO ₂ SOX NO ₂ NOX Removal

The cooking odour classes above are as classified by DEFRA in **Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems, PB10527**

GigaBox and accessory



■ Application

Multifunctional fan box, suitable for medium to higher air flow volumes against high resistances in every type of ventilation system. The compact frame construction offers easy conversion of the outlet position. Together with a choice of ideal accessories make these units ideal for all applications.

The GB.. T120 types are suitable for the extraction of dirty, humid and hot air up to max. 120° C, i.e. as extract air fan in commercial kitchens and many applications of process technology.

■ Casing

Self-supporting frame construction from aluminium hollow profiles. Double-walled side panels from galvanised sheet steel, lined with 20 mm thick temperature insulating and flame-retardant mineral wool.

Intake cone for ideal airflow, spigot and flexible connector for duct connection. With outlet adapter (from square to circular) on the exhaust side for low-loss discharge and flexible connector to reduce vibration transmission. The flexible connectors are supplied as standard and correspond to the max. permissible air flow temperature of +70 °C and/or +120 °C with the types GB.. T120. Lifting lugs are standard for using crane hooks.

With GB.. T120 the motor is located outside of the air flow. The thermally insulated partition panel is also the support plate for the motor and impeller unit and can be removed completely for inspection without removing the complete fan from the system.

■ Speed control

All types (except GBD 630/4 T120) are speed controllable by voltage reduction using a 5-step transformer controller or an electronic controller. The 3-phase models can also be 2 speed controlled by star/delta switch (accessories DS 2 or full motor protection unit M 4). The performances of the speeds are given in the performance curve. 3-phase models are controllable with frequency inverters by installation of a sinusoidal filter (accessories) between inverter and motor. Type GBD 630/4 is only controllable by frequency inverter.

■ Assembly

□ Assembly of types GB..

Adaptable installation position and flexible assembly using the five possible discharge directions via the discharge adapter. Removable panels allow inspection access on all sides.

□ Assembly of types GB.. T120

Installation must be carried out with condensation discharge showing downward. Flexible assembly by three possible centrifugal discharge directions via the discharge adapter. Inspection cover with handle, for cleaning and maintenance simply remove. Lifting lugs are standard for using crane hooks. Vibration transmission to the building is minimised by anti vibration mounts (type SDD-U, accessories). Vibration transmission to the ducting is prevented by using the standard flexible connector supplied.

■ Impeller

Smooth running centrifugal impeller with backward curved polymer blades (size 250 from steel) on a galvanised steel back plate, direct driven. Size 500 and all GB.. T120 types with impellers from aluminium. These energy efficient impellers are low noise. Dynamically balanced assembled with the motor to DIN ISO 1940 Pt.1 – class 6.3 or 2.5.

■ Motor

IEC-standard motor or maintenance-free external rotor motor protected to IP 54 or 44. Thermal overload protection through built-in thermal contacts. Suitable for continuous operation S1. Insulation class F. Ball bearings are lubricated for life.

■ Electrical connection

Terminal box protection to IP 54.

■ Air flow direction

The air flow direction of centrifugal fans is not reversible, but can be set by positioning the fan to the required air flow direction. Furthermore the position can be set individually to constructional conditions through conversion of discharge adapter and panels. The correct motor rotation direction is marked through rotation arrows on the motor and has to be checked at start-up.

■ Incorrect direction of rotation

If the fan is operated in the incorrect direction of rotation the motor will overheat and the thermal contact will trip. Typical indication for this is a very low air flow combined with high noise levels and vibration.

■ Ambient temperature

The maximum permitted air flow temperature is given in the individual fan chart.

■ Surrounding temperature

From – 40° C to + 40° C.

Information	Pages
Design of systems, acoustic	12 on
General techn. information, speed control	17 on

Type GB..	Sound press. Case breakout	Sound press. Intake	Air flow volume \dot{V} m ³ /s against static pressure												
	L _{PA} dB(A)	L _{PA} dB(A)	$(\Delta P_{stat.})$ in Pa												
	at 4 m	at 4 m	0	50	100	150	200	250	300	350	400	500	600	700	800
GBW 250/4	27	39	0.389	0.319	0.244	0.147									
GBW 315/4	29	41	0.414	0.361	0.300	0.236	0.153	0.042							
GBW 355/4	34	46	0.817	0.747	0.675	0.594	0.505	0.400	0.258						
GBD 355/4/4	34	46	0.836	0.772	0.711	0.638	0.577	0.492	0.367	0.089					
GBW 400/4	38	50	1.142	1.092	1.036	0.975	0.917	0.85	0.764	0.656	0.511				
GBD 400/4/4	38	50	1.097	1.031	0.961	0.889	0.811	0.725	0.628	0.469	0.114				
GBW 450/4	40	52	1.514	1.433	1.361	1.292	1.217	1.122	1.006	0.867	0.692	0.083			
GBD 450/4/4	40	52	1.514	1.431	1.344	1.256	1.161	1.061	0.947	0.822	0.664	0.083			
GBW 500/4	45	57	2.333	2.236	2.139	2.042	1.947	1.85	1.744	1.628	1.506	1.219	0.778	0.042	
GBD 500/4/4	44	57	2.458	2.367	2.278	2.189	2.097	2.006	1.903	1.789	1.664	1.369	0.947	0.014	
GBW 500/6	35	46	1.600	1.478	1.347	1.189	0.978	0.678	0.144						
GBD 560/4/4	44	57	3.497	3.397	3.300	3.203	3.106	3.011	2.911	2.811	2.706	2.461	2.142	1.731	1.144
GBD 560/6/6	35	48	2.400	2.261	2.114	1.953	1.767	1.539	1.239	0.767					
GBD 630/4/4	48	61	4.153	4.058	3.961	3.869	3.775	3.683	3.592	3.500	3.403	3.194	2.953	2.675	2.333
GBD 630/6/6	43	56	3.192	2.992	2.794	2.597	2.375	2.103	1.767	1.356	0.792				
GBD 710/6/6	46	59	5.194	4.989	4.783	4.564	4.333	4.083	3.811	3.511	3.178	2.333	0.753		
Type GB.. T120	L _{PA} dB(A)	L _{PA} dB(A)	$(\Delta P_{stat.})$ in Pa												
	at 4 m	at 4 m	0	50	100	150	200	250	300	350	400	500	600	700	800
GBW 355/4 T120	36	49	0.961	0.894	0.831	0.767	0.683	0.567	0.418	0.201					
GBD 355/4/4 T120	36	49	0.964	0.908	0.846	0.778	0.697	0.594	0.469	0.192					
GBW 400/4 T120	40	53	1.369	1.293	1.217	1.136	1.053	0.942	0.806	0.622	0.439				
GBD 400/4/4 T120	40	53	1.353	1.275	1.193	1.106	1.014	0.900	0.761	0.581	0.381				
GBW 450/4 T120	45	57	1.975	1.887	1.800	1.700	1.625	1.525	1.426	1.317	1.208	0.917	0.528		
GBD 450/4/4 T120	45	57	1.994	1.914	1.833	1.750	1.653	1.556	1.450	1.336	1.206	0.897	0.372		
GBW 500/4 T120	45	59	2.318	2.244	2.158	2.075	1.989	1.903	1.800	1.696	1.575	1.300	0.975	0.511	
GBD 500/4/4 T120	45	59	2.319	2.239	2.157	2.081	1.994	1.911	1.833	1.739	1.642	1.381	1.061	0.533	
GBD 560/4/4 T120	48	62	3.417	3.322	3.247	3.164	3.078	2.994	2.910	2.817	2.722	2.533	2.336	2.064	1.671
GBD 630/4 T120	53	67	3.928	3.867	3.803	3.742	3.667	3.594	3.533	3.469	3.397	3.242	3.097	2.908	2.703

Special application for GigaBox T120 – commercial kitchens

For the design of exhaust air systems in commercial kitchens the VDI 2052 (2006) "Ventilation equipment for kitchens – design, layout, approval" is applied. This follows for extract air fan:

- Fans of exhaust air systems must be designed and installed in such a way that they are easily accessible, can be easily controlled and cleaned.
They must be able to be switched off from the kitchen.
The motors must be located outside of the extract air flow.
Connected kitchen extraction hoods must separate solid and liquid components, if possible.
A backdraft into following units is to be prevented.

These specific requirements from the GigaBoxes GB.. T120 are fulfilled in an outstanding manner. Easily accessible casing and double-walled side panels make cleaning simple with grease dissolving agents and steam possible.

Requirements in excess thereof of kitchen extract air units and the appropriate fire protection can deviate country-specifically; these special requirements of the respective country, in which the unit is to be used, must be considered.

NEW!

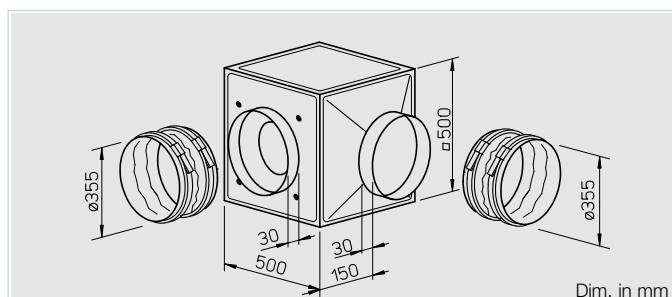
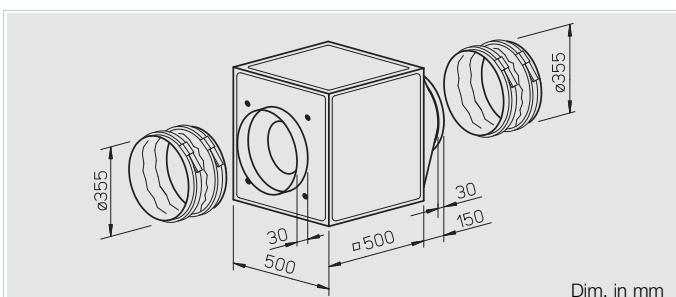
Models GB..

Arbitrary installation position and flexible assembly by five possible discharge directions.



Models GB.. T120

Designed for moving dirty, humid and hot air up to max. 120° C.



Special features of type GB.. T120

- Designed for moving dirty, humid and hot air volumes up to max. 120° C.
- Motor located outside of air flow.
- Temperature insulated partition panel between motor and impeller, lined with 20 mm thick, flame-retardant mineral wool.
- Easily accessible motor and impeller unit, removable without disassembling the system components.
- Inspection cover with handle, simply remove for cleaning and maintenance.
- Condensate collector with condensate spigot included in delivery. Drill hole for rain drainage (accessories) for outdoor installation is prepared.

Assembly of types GB.. T120

Installation must be carried out with condensation discharge showing downward. Flexible assembly by three possible centrifugal discharge directions via the discharge adapter. Outdoor installation is possible using outdoor cover hood and external weather louvers (accessories).

Feature

Assembly of types GB..

Arbitrary installation position and flexible assembly by five possible discharge directions via the discharge adapter. For wall mounting the wall bracket (accessories) have to be used. Outdoor installation is possible using outdoor cover hood and external weather louvers (accessories).

Specification of both types

Casing

Self-supporting frame construction from aluminium hollow profiles. Double-walled side panels from galvanised sheet steel, lined with 20 mm thick temperature insulating and flame-retardant mineral wool. Intake cone for ideal inflow as well as spigot and flexible sleeve (for the respective max. permissible air flow temperature) for duct connection. With discharge adapter (from square to circular) on the pressure side for low-loss discharge and flexible sleeve to reduce vibration transmission. Simple positioning by standard crane hooks.

Impeller

Smooth running backward curved centrifugal impeller highly efficient with polymer blades on galvanised steel disc (with GB.. T120 aluminium impeller), direct driven. Energy efficient with a low noise development. Dynamically balanced together with the motor to DIN ISO 1940 Pt.1 – class 6.3.

Motor

Maintenance-free external rotor motor or IEC-standard motor protected to IP 44 or 54. With ball bearings and radio suppressed as standard.

Electrical connection

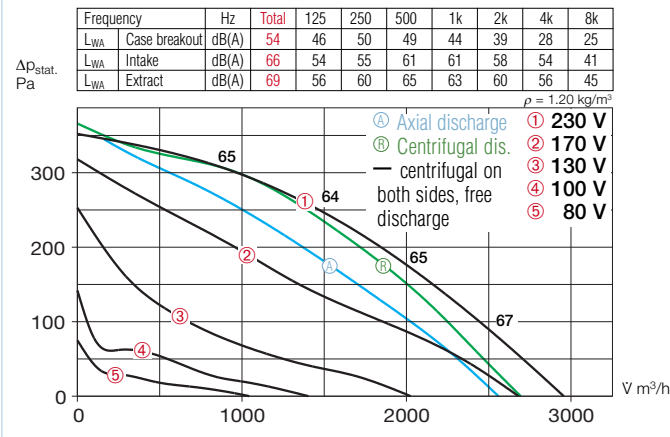
Standard terminal box (IP 54) fitted on the motor; with GB.. T120 fitted on the motor support plate.

Type	Ref. No.	Air flow volume (FID) V m³/h	R.P.M. min⁻¹	Sound press. level case breakout dB(A) at 4 m	Motor power (nominal) kW	full load A	Current speed controlled A	Wiring diagram Nr.	Maximum air flow temperature full load +°C	Nominal weight (net) kg	5 step transformer controller with motor protect. unit Type Ref. No.	Full motor protection unit using the thermal contacts Type Ref. No.
1 Phase motor, 230 V / 1 ph. / 50 Hz, capacitor motor, protection to IP 54												
GBW 355/4	5511	2940	1325	34	0.29	1.30	1.40	864	60	60	MWS 1.5 1947	TSW 1.5 1495 MW ¹⁾ 1579
2 speed motor, 3 Phase motor, 400 V / 3 ph. / 50 Hz, Y/Δ-wiring, protection to IP 54												
GBD 355/4/4	5512	2700/3010	1115/1355	34	0.20/0.30	0.35/0.70	0.70	867	55	55	RDS 1 1314	TSO 0.8 1500 M4 ²⁾ 1571
1 Phase motor, 230 V / 1 ph. / 50 Hz, capacitor motor, protection to IP 54												
GBW 355/4 T120	5770	3460	1340	36	0.32	1.60	1.80	935	120	120	MWS 3 1948	TSW 3.0 1496 MW ¹⁾ 1579
2 speed motor, 3 Phase motor, 400 V / 3 ph. / 50 Hz, Y/Δ-wiring, protection to IP 54												
GBD 355/4/4 T120	5771	2990/3470	1100/1360	36	0.22/0.33	0.40/0.80	0.80	947	120	120	RDS 1 1314	TSO 0.8 1500 M4 ²⁾ 1571

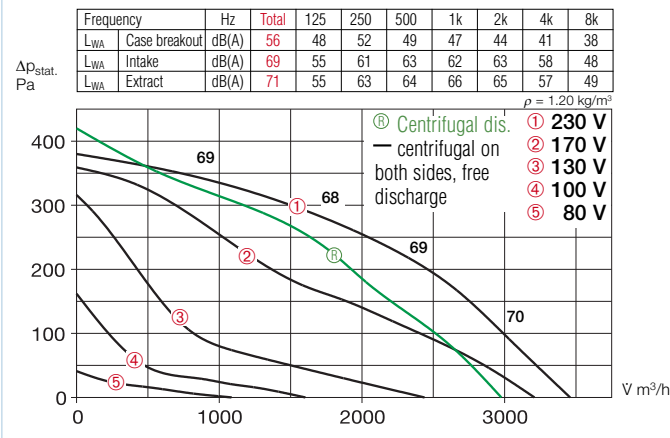
¹⁾ incl. operation switch

²⁾ incl. operation and 2 speed switch

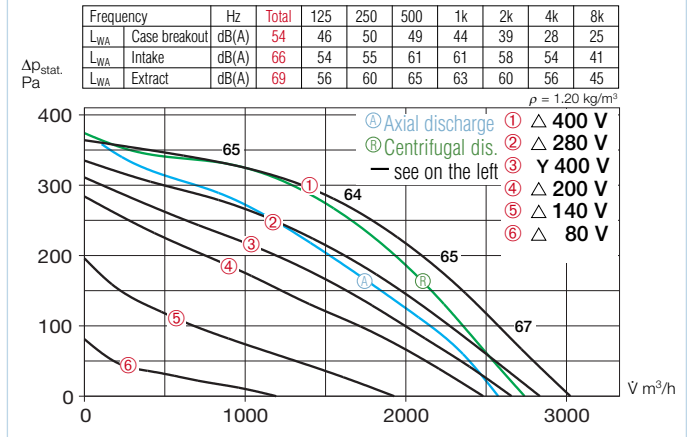
GBW 355/4



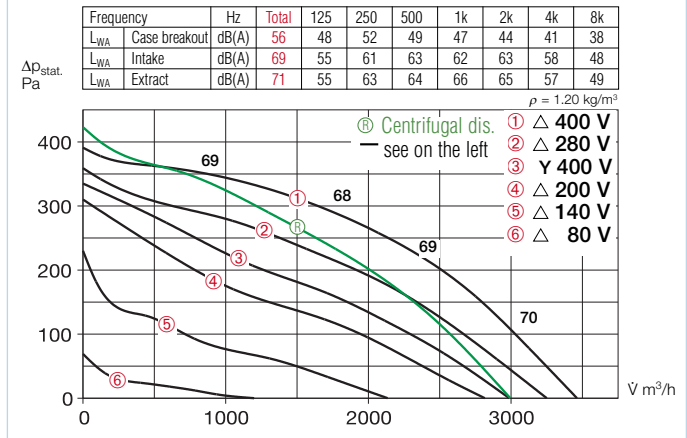
GBW 355/4 T120



GBD 355/4/4



GBD 355/4/4 T120



Motor protection

Motors have thermal contacts wired to the terminal block and must be connected to a motor protection unit.

Speed control

All types are speed controllable by voltage reduction using a transformer controller. The 3-phase models can also be 2 speed controlled by star/delta switch (accessories DS 2 or full motor protection unit M 4). The duties at different speeds are given in the performance curve.

Sound levels

Total sound power levels and the spectrum figures in dB(A) are given for:

- sound level case breakout
 - sound level intake
 - sound level extract
- in the tables above the performance curve. Beside, the sound power level (on intake) is stated over the rated characteristic curve. In the table below you can also find the
- case breakout level at 4 m (freefield conditions).

Accessories of both types

Anti vibration mounts for installation indoors. Set of 4.

SDD-U Ref. No. 5627

Wall bracket for wall mounting.

GB-WK 355 Ref. No. 5625

External weather louvers to cover exhaust opening.

GB-WSG 355 Ref. No. 5638

Outdoor cover hood for outdoor installation.

GB-WSD 355 Ref. No. 5747

On/Off and 2-speed switch for 3-phase star/delta motors.

DS 2³⁾ Ref. No. 1351

³⁾ full motor protection unit recommended: MD Ref. No. 5849

Specific accessories

for types GB..

Condensate collector with condensate spigot for pipe connection.
GB-KW 355 Ref. No. 5643

(Condensate collector with condensate spigot included in delivery with GB.. T120).

for types GB.. T120

Rain drainage for outdoor installation (drill holes for rain drainage is already prepared).

GB-RA Ref. No. 9418

Information	Pages
Design of systems, acoustic	12 on
General techn. information, speed control	17 on
Accessory-Details	Pages
Speed controller and full motor protection unit	397 on