



# Kitchen Ventilation SPECIFICATION INFORMATION

Requirements for the installation of a complete kitchen ventilation system. Document includes canopy, ventilation and other associated specifics



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## Property Details

*PIZZA HUT*

*FALLOWFIELD RETAIL PARK*

*BIRCHFIELD ROAD*

*MANCHESTER*

## Site Requirements

### *Brief description of site requirement*

High level discharge with high velocity cowl and bird mesh guard.

This proposed system to be mounted or hung on anti-vibration mountings to reduce any reverberation type vibration from the extraction system, travelling through the building.

Access doors installed in ducting system for cleaning and maintenance.

**We can confirm that the design and specification for the extraction system at the above address is in accordance with DW172 specification.**

### Summary of detailed information attached in this specification

#### **Extraction:**

| Volume M3/second | Resistance | Discharge Velocity | Filtration | Noise level |
|------------------|------------|--------------------|------------|-------------|
| 1.55 M3/sec      | 115 pa     | 12.40              | -          | 45 dba      |

#### **Supply:**

| Volume m3/second | Resistance | Replacement Percentage | Air Filter | Noise level |
|------------------|------------|------------------------|------------|-------------|
| 1.32 M3/sec      | 120 pa     | 80%                    | EU4        | 41dba       |

**Gas needs a minimum of 0.50 M/Sec Face velocity in order to meet the emissions requirements**

## Introduction

### Canopy design

With the canopy supplied we have based the extraction airflow duty on the cooking type appliances underneath and calculated the volume required to capture the grease-laden air and heat removal over the appliances used.

Our Kitchen extraction Canopies are manufactured out of 430 or 304 grade stainless Steel. Stainless steel baffle filters within the canopy housing fully welded drain channel and complete with grease tap or grease pot.



#### Grease Tap

A stainless-steel ball valve with plastic lever handle, threaded if want to make a permanent grease run off to grease pack.

These are installed at one or each end of the canopy, where the grease runs down the welded drain channel, turn the tap

Anti-clockwise and drain off any excess grease or oil and wash with hot soapy water and turn lever clockwise to shut off.



#### Grease Pot

Installed in bottom plenum a removable pot at one or each end of the canopy, where the grease runs through hole above into the drain pot, remove the pot and dispose of the grease appropriately, wash out with hot soapy water and re-fit by pushing back into the slides, wash drain channel with hot soapy water and drain off any excess grease or oil.

This is for good housekeeping for cleaning grease daily and is easily accessible

Our canopies are installed at a working height of 2000mm underneath the canopy. 300mm overhang on front and sides of appliances.

### **Proposed system specification**

Brief description of site requirement

Discharge at high level at the rear of the building through a high velocity flue dilution cowl complete with bird guard. Being a designated Retail Park away from any residential properties no odour abatement required, flue will dilute, and the efflux velocity will send high in to atmosphere.

All fans and equipment to be mounted in false ceiling void internally to minimise noise migration, galvanised ducting off the Island canopy, to a mixed flow fan inline acoustic lined cabinet fan and silencer mounted on anti-vibration hangers, after the silencer ducting transposing to 450mm diameter spiral ducting rising to roof level and terminating one metre above the eaves with a high velocity discharge cowl complete with bird guard. Access doors for cleaning and maintenance.

## Canopy Information

2500mm (long) x 2000mm (wide) brushed stainless steel Pizza Island canopy, complete with stainless steel baffle filters. Incorporated within each side of the canopy would be, stainless steel baffle filters each side above conveyor belts.

Volume required 1.55 M3/sec at 115 pascals

Minimum velocity Requirements for Canopy

**Light loading** – 0.25 m/s (applies to steaming ovens, boiling pans, stock-pot stoves) Pizza shop, bakery

Medium loading – 0.35 m/s (applies to deep fat fryers, solid and open top ranges and griddles) cafes, pubs

Heavy loading – 0.5 m/s (applies to char grills, specialist broiler units) Indian, Chinese, kebab shops.

## Baffle filter information



It is universally recognised that there is an increasing need to maintain & improve hygiene standards & reduce fire hazards within kitchens. The Baffle Grease filter accomplishes both needs through its clever design of interlocking baffles that provide a tortuous route for the passage of air through the filter by creating two rapid 180° air direction changes simultaneously. The grease molecules having a far greater inertial force than air impact themselves on the vanes.

A series of vertical Stainless-Steel vanes are housed in a channel frame, with each of the baffles strategically aligned to provide the highest potential for grease removal.

Due to the smooth nature of the vanes the grease naturally runs downwards, through the drainage holes and into the collecting trays normally provided within the canopy holding casings.

## Extraction System Information

Galvanised mild steel sheet of lock-formed ducting in accordance with DW144. Constructed from hot-dip galvanized steel sheet. Joints and spigots sealed with High-pressure ducting sealant, which complies with HVCA specification DW144.

Air supply ducting into the kitchen to supply fresh ambient air through ceiling grilles mounted in suspended ceiling, Fan mounted at high level in ceiling void complete with silencer to a 750mm square weather louvre mounted in rear wall supplying fresh ambient air through ceiling diffusers.

Criteria: which our design is based on regarding airflow velocities.

**Weather cowl:** 10-15 M/sec to disperse high into atmosphere for flue dilution.

**Duct velocities should be as follows:** Extract (m/s) Main runs 6-8 M/sec with the branch and spigots 5-7 M/sec.

## Type of discharge cowl

High velocity cowl with bird guard to increase velocity discharging @ 12.40 M/sec.

Volume 1.55 M3/sec divided by 0.125 M2 =10.37 M/sec this will create an efflux velocity to dilute into the atmosphere.

## Extraction fan details

Located Internally 4 pole, single-phase mixed flow fan at the designed Duty: 1.55m3/sec @ 275 Pascal's resistance.

## System resistance calculations

|                                              | Extraction system        | Pascal's      |
|----------------------------------------------|--------------------------|---------------|
| 1                                            | Ducting system           | 60 pa         |
| 8                                            | Baffle filters in canopy | 55 pa         |
| <b>Total static resistance on the system</b> |                          | <b>115 pa</b> |

## Selected Fan Details

| Fan Model                                                                                                                                                                                                                                                                                                                                                          | Type       | Volume<br>m3/sec | Resistance   | Rpm  | Phase | Noise level       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------------|--------------|------|-------|-------------------|
| 500 CVAT                                                                                                                                                                                                                                                                                                                                                           | Mixed flow | 1.55             | 115 Pascal's | 1470 | 3/1   | 58 dba @ 3 Metres |
| <p>With the fan mounted internally with a 450mm 2D silencer after the fan, approximately 8 metres from discharge cowl the fan noise level will be greatly reduced and is estimated to be 45 dba @ 3 metres distance from the cowl.</p> <div data-bbox="413 1207 1211 1827" data-label="Figure"> <p style="text-align: center;">CVAT/4-9000/500N D 1,1kW</p> </div> |            |                  |              |      |       |                   |
| 1.55 M3/sec (5926 M3/hr) @ 115 Pascals                                                                                                                                                                                                                                                                                                                             |            |                  |              |      |       |                   |
|                                                                                                                                                                                                                                                                                                                                                                    |            |                  |              |      |       |                   |

The canopy to have a fresh ambient air supply air system with CD4 air diffuser grilles into the kitchen ceiling, this helps with extraction efficiency and a better working environment for staff.

It is advisable to install an air supply system with the fan and ducting supplying fresh ambient air through canopy face supply grilles.

The requirement is to supply fresh ambient air to replace approximately 80% of the extract flow rate volume of the extracted air.

**Extraction Duty: 1.55 M3/sec 80% of extraction volume = 1.34 M3/sec**

**System resistance calculations**

|                                | Supply system                   | Pascal's   |
|--------------------------------|---------------------------------|------------|
|                                | Ducting, weather cowl & Grilles | 120        |
| <b>Total system resistance</b> |                                 | <b>120</b> |

#### Selected Fan Details

| Fan Model                                         | Type         | Volume m3/sec | Resistance          | Speed rpm   | Phase    | Noise level @ 3 metres |
|---------------------------------------------------|--------------|---------------|---------------------|-------------|----------|------------------------|
| <b>450 ZSC</b>                                    | <b>AXIAL</b> | <b>1.32</b>   | <b>120 Pascal's</b> | <b>1470</b> | <b>1</b> | <b>41 dba</b>          |
| 49DB with the silencer reduction minus 8 decibels |              |               |                     |             |          |                        |

## Sabre Sickle Short Case Fans (VSC)

- Swept impeller with Aerofoil blades, winglets and serrated trailing edge for optimum performance
- One shot die cast impeller, dynamically balanced for smoother operation
- Operating temperature up to 70°C
- External Rotor Motors on all models for compact efficient design
- All models speed controllable
- Guards fitted as standard on all models
- Thermal Overload Protection for motor protection
- Maintenance free sealed for life bearings
- 2 Year Guarantee



#### Performance Guide

| Stock Ref | Supply   | IP     | Motor | F.L.C. | S.C. | Volume m³/s @ Pa |      |       |             |      |      |      |      |      |      | dB(A) @ |      |
|-----------|----------|--------|-------|--------|------|------------------|------|-------|-------------|------|------|------|------|------|------|---------|------|
|           |          | Rating | kW    | Amps   | Amps | Poles            | rpm  | Curve | 0           | 25   | 50   | 75   | 100  | 125  | 150  | 175     | 3.0m |
| VSC45014  | 230/1/50 | IP54   | 0.6   | 2.9    | 11.6 | 4                | 1320 | 1     | Volume m³/s | 1.98 | 1.86 | 1.72 | 1.58 | 1.50 | 1.31 |         | 49   |
|           |          |        |       |        |      |                  |      |       | Power Watts | 481  | 490  | 510  | 530  | 537  | 546  |         |      |

## Extraction fan details

### Soler & Palau CVAT Acoustic cabinet fan description details

#### ACOUSTIC CABINET FANS CVAB-N / CVAT-N Series



Range of direct drive backward curved centrifugal cabinet fans designed for ventilation of commercial kitchens and industrial applications. Cabinet fan manufactured from aluminium profiles and double thickness side panels internally lined with 25 mm thickness of fireproof fiberglass acoustic insulation. Circular duct connection flange on the inlet and outlet. CVAB-N/CVAT-N incorporates direct drive backward curved centrifugal impeller, manufactured from aluminium (CVAB-N) or steel (CVAT-N) sheet, with motor fitted inside the air stream.

#### Motors

##### CVAB-N

Single-phase external rotor motors 230V 50Hz, IP55, class F, with thermal protection, speed controllable by tension. Working temperature from -40°C to 60°C.

##### CVAT-N

Three-phase 4 and 6 pole motors 230/400V 50Hz, IP55, class F, with thermal protection (PTC), speed controllable by inverter. Working temperature from -20°C to 40°C.

#### ATEX versions

On request, explosion proof versions in accordance to ATEX Directive, for three phase models.

Working temperature from -20°C to +40°C.

##### - ATEX Flameproof - Gas

In standard ATEX version flameproof motors are without thermal protection.

If used with frequency inverter, flameproof motors with a PTC-type thermal protection must be specified at order.

⊕ II 2G Exd IIB T4

⊕ II 2G Exd IIB+H2 T4 (with motor Exd IIC T4)

##### - ATEX Increased safety - Gas

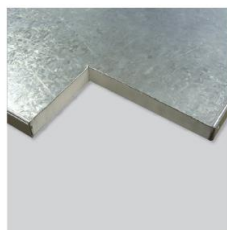
⊕ II 2G Exe IIC T3

To select CVAT-N ATEX refer to performance curves, or Easyvent. Note electrical data may vary for ATEX motors.



#### Backward curved centrifugal impellers

To prevent accumulation of dirtiness. Dynamically balanced.



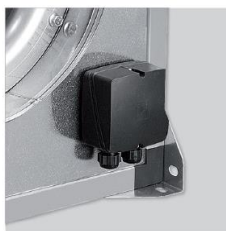
#### Low noise level

Double thickness side panels lined with 25 mm thickness of fireproof fiberglass acoustic insulation.



#### Robustness

Quality finished aluminium profiles and plastic corners providing a great robustness.



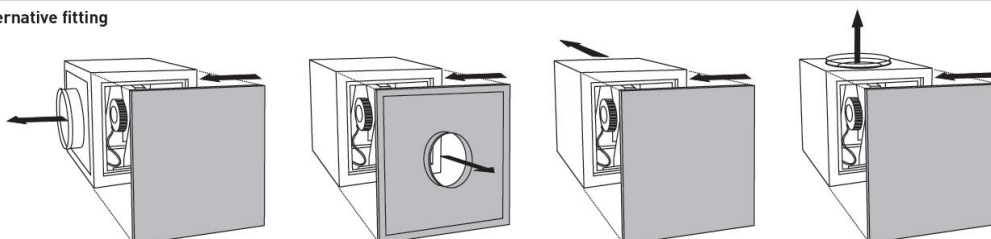
**IP55 external terminal box**  
To ease electrical connection. Only available for CVAB single-phase models. For three-phase models, connection to the motor terminal box.

#### Specific applications

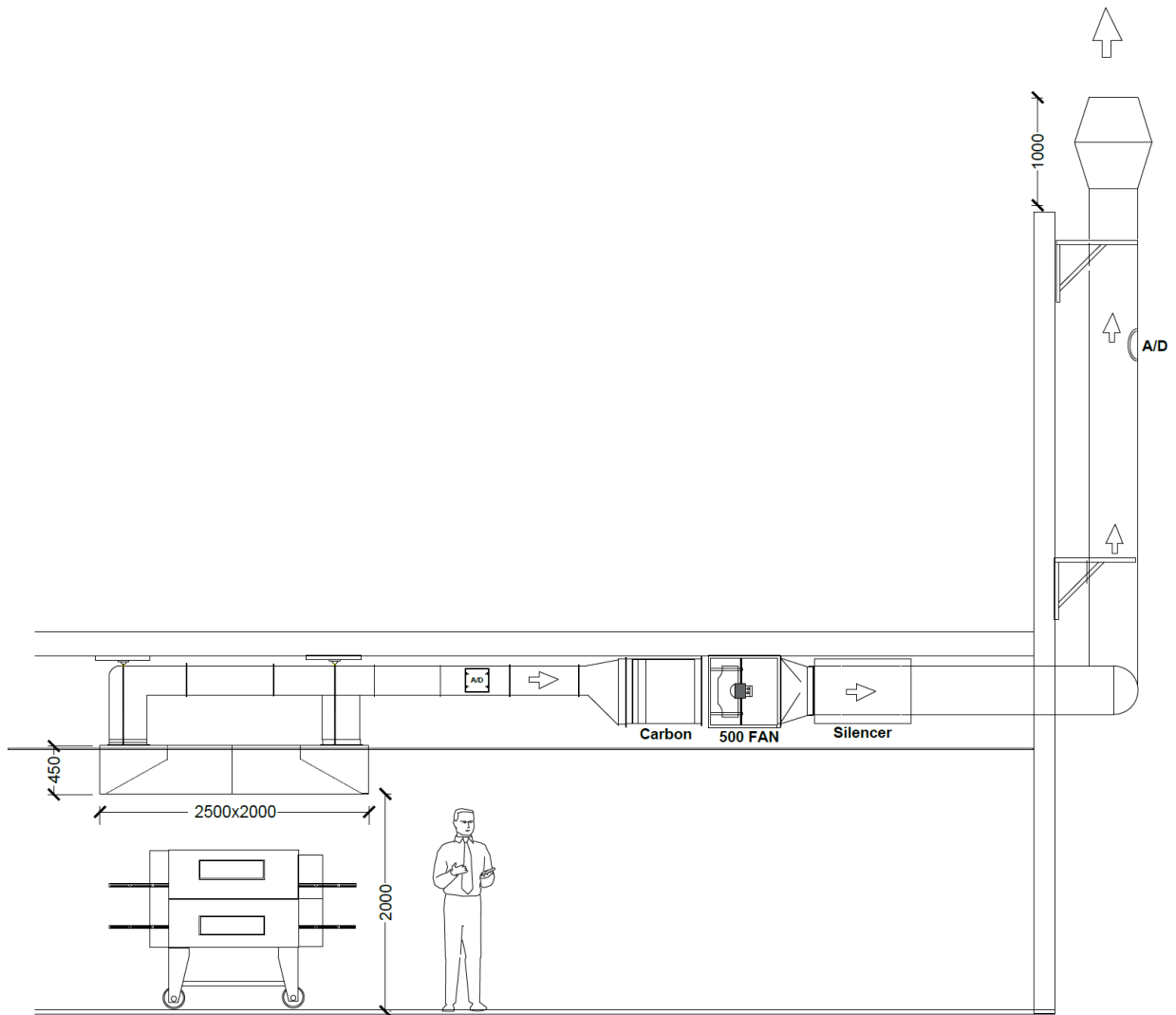


Versions

#### Alternative fitting



## Schematic view of system



With the fan mounted internally to minimise break out noise

