Vent-Axia Ventilation Design Guidelines

Successful Planning

Today, people are becoming increasingly aware of the problems of indoor pollution and the important contribution that well-planned ventilation makes to modern living.

Effective ventilation is now regarded as a necessity because no-one can feel their best or work efficiently in air that contains smells, smoke, moisture or excessive heat. Stale air in pubs, clubs,offices and workshops is bad for business. In the stuffy atmosphere created by lack of ventilation, colds, flu and airborne viruses will quickly spread. Vent-Axia controlled ventilation can help in all these situations and reduces lost output caused by absenteeism through illness.

Damaging condensation affects 4.5 million homes in the UK alone. This can quickly cause paintwork and wallpaper to deteriorate and encourages mould, stains and a deterioration of the property. So people are faced with the expensive cost of redecorating.

Unfortunately, modern thermally efficient buildings are not designed to encourage natural ventilation. The Building

Regulations are recognising this problem and, nationally, local authorities are specifying higher rates of ventilation. When installing ventilation it is most important to obtain maximum efficiency from the investment so proper planning is essential.

What size of unit & how many ?

The correct size, type and number of Vent-Axia units required for any area is determined by three factors: the room size, its use and location.

First, work out the volume of the room by multiplying length x width x height. This volume is then multiplied by the required number of air changes per hour (ACH) given in the table to give the total air movement required per hour. Select the number of fans necessary to achieve the desired volume.

The Building Regulations (Document F) require the following intermittent ventilation rates in new dwellings. Alternatively ventilate continuously at 0.3l/s/m^2:

- Kitchen areas: an extract rate of no less than 216m^3/h 60 l/sec. For calculation purposes we recommend a minimum air change rate of 15 per hour.
- Utility rooms: an extract rate of no less than 108m^3/h 30 l/sec. For calculation purposes we recommend a minimum air change rate of 15 per hour.
- Bathrooms: an extract rate of no less than 54m^3/h 15 l/sec. For calculation purposes we recommend a minimum air change rate of 6 per hour.
- WC's: an extract rate of no less than 6 l/sec. For calculation purposes we recommend a minimum air change rate of 6 per hour.

The new requirements are designed to remove steam and smells at source before they are able to migrate causing damage to colder parts of the dwelling.

Air Changes Per Hour (ACH) Table

This table provides suggested air changes per hour (ACH) under normal conditions based on Vent-Axia's extensive experience.

Assembly rooms	4 - 8	Dye works	20 - 30	Living rooms	3 - 6
Bakeries	20 - 30	Electroplating shops	10 - 12	Mushroom houses	6 - 10
Banks/Building Societies	4 - 8	Engine rooms	15 - 30	Offices	6 - 10
Bathrooms	6 - 10	Entrance halls & corridors	3 - 5	Paint shops (not cellulose)	10 - 20
Bedrooms	2 - 4	Factories and workshops	8 - 10	Photo & X-ray darkrooms	10 - 15
Billiard Rooms *	6 - 8	Foundries	15 - 30	Public house bars	12 minimum
Boiler Rooms	15 - 30	Garages	6 - 8	Recording control rooms	15 - 25
Cafes and coffee bars	10 - 12	Glasshouses	25 - 60	Recording studios	10 - 12
Canteens	8 - 12	Gymnasiums	6 minimum	Restaurants	8 - 12
Cellars	3 - 10	Hairdressing salons	10 - 15	Schoolrooms	5 - 7
Changing Rooms Main area	6 - 10	Hospitals - sterilising	15 - 25	Shops and supermarkets	8 - 15
Changing Rooms Shower area	15 - 20	- wards	6 - 8	Shower baths	15 - 20
Churches	1 - 3	Kitchens - domestic	15 - 20	Stores & warehouses	3 - 6
Cinemas & theatres *	10 - 15	# - commercial	30minimum	Squash courts	4 minimum
Club rooms	12 minimum	Laboratories	6 - 15	Swimming baths	10 - 15
Compressor rooms	10 - 20	Laundrettes	10 - 15	Toilets	6 - 10
Conference rooms	8 - 12	Laundries	10 - 30	Utility rooms	15 - 20
Dairies	8 - 10	Lavatories	6 - 15	Welding shops	15 - 30
Dance halls	12 minimum	Lecture theatres	5 - 8		
Dental surgeries	12 - 15	Libraries	3 - 5		

*Increase by 50% where heavy smoking occurs or if the room is underground.
Some commercial kitchens may require higher ventilation rates, based on cooking equipment in use.

The total extract airflow rate during normal operation of a continuous mechanical ventilator eg. MultiVent etc, should be 0.3 l/s/m^2. This is based on the whole dwelling volume, with provision to increase the inlet volume, as required, in moisture generation areas.

Siting the unit correctly & safely

In rooms containing fuel burning appliances, care should be taken to ensure that air replacement is adequate for both the fan and the fuel burning appliance.

Wiring should be carried out in accordance with current IEE regulations (UK) or the appropriate standards in your country.

Always check that the supply voltage, fuse rating and wiring are correct and that installation is in accordance with the instructions provided with the product.

Bathrooms

Vent-Axia recommends that mains voltage fans be sited out of reach of a person using a fixed bath or shower. Ensure that mains fans and controls are sited well away from all sources of water spray. We recommend that electrical products of this kind be installed in accordance with mandatory regulations and their official guidance documents.

Safety Extra Low Voltage (SELV) fans are available for installation within bath or shower rooms in accordance with relevant wiring regulations. The mains transformer control unit with SELV output must be sited away from any source of water spray and out of reach of a person using a fixed bath or shower.

Ducted applications

Ducts passing through an unheated roof void should be insulated to minimize condensate formation. Vertical ducts should be fitted with a condensation trap and means of running off condensate and terminated with a weather proof cowl of sufficient free area for the air volume. Horizontal ducts should fall away from the fan unit.

General

Ventilation units should be placed as high as possible in the window or wall near any local smells and steam but not directly above eye level grills, cookers or direct sources of heat in excess of +40°C. Do not site in areas containing excessive levels of grease without suitable filters.

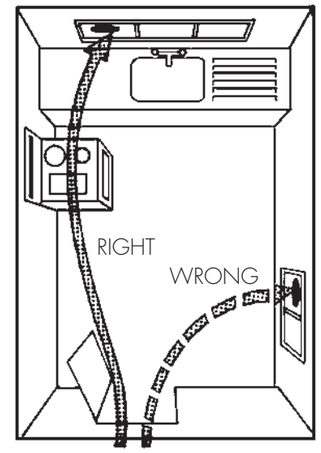
In large rooms the extract points should be positioned correctly to obtain even ventilation in all areas. A short circuit of airflow will be avoided by siting units as far away as practicable from the main source of air replacement.

Maintenance

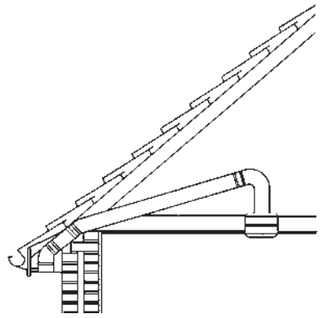
Site the fan so that it is accessible for regular periodic cleaning and servicing. Make sure that grilles, motor cooling ports and impellers are able to function freely in accordance with guarantee requirements.

Electrical equipment should be isolated before carrying out any maintenance or cleaning. All fans should be regularly cleaned and checked, (every month or so, dependent on usage). Bearings should be oiled where appropriate twice a year, unless stated otherwise.

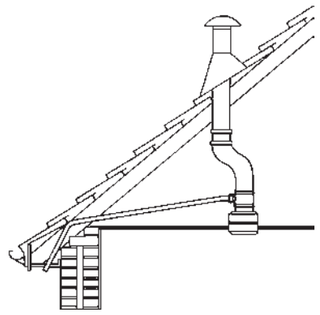
Kitchen applications



Ducted applications through roof voids



HORIZONTAL DUCT



VERTICAL DUCT

Ensure pipes have a vertical overlap.