



Natural Ventilation Systems

An introduction to our Windvent natural ventilation units. Designed for use in commercial applications.



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Join the Natural Revolution

Greener Buildings

One of the major challenges faced by the modern building designer in recent years has been the search for new ways to significantly reduce energy consumption and the avoidance of what was once labelled sick building syndrome. Faced with rising energy costs, ever increasing environmental damage and the resultant politically-driven legislation, many businesses have now become critically aware of their building's energy consumption, carbon emissions and the working environment. The collective result of which has been to find new ways to encompass a universal solution. Welcome to Windvent and Natural Ventilation Systems.

How a Windvent Works

The natural ventilation system operates on well-established aerodynamic principles. As air flows around a terminal, positive and negative pressure areas are generated. On the positive side air enters the louvres of the terminal and is directed down through the internal vanes into the room below. This action is brought into equilibrium by the negative pressure on the leeward side of the terminal, which induces air to leave the terminal drawing the stale hot air from the room below. This process is aided by the thermal stack effect, resulting in a flow of air in and out of the room.

Why Choose Windvent?

Windvent systems are logical and suitable strategies for many buildings, from low rise dwellings and schools to small or medium sized offices, recreational or public buildings. They are highly cost-effective once installed, when compared with the maintenance and operational costs of conventional air conditioning or mechanical ventilation systems. Natural ventilation has been proven to improve staff and pupil productivity and our systems have been successfully installed in many commercial and industrial premises across the UK.

Midterm Windvents operate on aerodynamic principles. They are driven by the provision of an air thermal effect with the corresponding extraction rate flow and a natural function of balance and equilibrium. To activate the process, the only energy required is for a low voltage controller unit that drives the dampers, modulating the input of natural air.

Schools and commercial buildings where Windvents have been installed have gained from reduced CO₂ emissions, energy savings and occupants' wellbeing. A fresh cool air supply delivered via natural ventilation has been proven to reduce staff sickness, reduce energy waste and increase occupants' productivity compared to offices that have no provision to ventilate automatically.

Windvents have acoustic lining as standard, the thickness of which can be increased up to 50mm should required noise levels dictate, thus providing efficient, economical and aesthetic acoustic solutions to ventilating buildings.



Windvent in Practice

How does the Windvent compensate for changes in weather?

Automatically adjusting dampers are provided within the system to allow for differing temperatures, wind conditions or air quality requirements. These dampers are linked to a programmable control system which allows for the ventilation rate to be controlled by internal and external sensors. Night purging can be achieved when the dampers are set to fully open during warm nights when a building is unoccupied. Conversely, in the colder months, the controller will reduce the flow of air to trickle ventilation rates as specified in the CIBSE guide and hence retain the boiler heated air in the occupied space.

How do I know how much air supply I will need?

Air change rates are determined by the building occupancy levels and are calculated according to CIBSE or BB101 standards. A low voltage controller unit then maintains this provision of fresh air and the corresponding extraction rate via temperature and CO₂ sensors.

How many Windvents will I need?

The size and quantity of terminals required is based on the calculated air change rates. For larger rooms a series of units may be required.



Design, Manufacture & Installation

Design

Terminals can be manufactured in keeping with the architectural aesthetics of the buildings to which they are installed, or alternatively, they can be designed and manufactured to give a contrasting appearance, adding a feature aspect to the overall structure of the building. Windvent louvres are designed to ensure that the maximum available free area of the unit is utilised.

Manufacture

Our Windvent units are constructed in-house by experienced craftsmen and women. They are made from fully welded, corrosion-resistant aluminium and fitted with BSRIA tested internal acoustic and fire-resistant material. Adjustable insulated modulating dampers and transfer grilles are manufactured from anodised aluminium or perforated stainless steel panels, so they maintain weather integrity at all times. All units are manufactured to BS EN ISO 9001 and to suit architectural design requirements. They are also powder coated to your specification in any standard RAL colour.

Installation

Windvents are installed by our own highly experienced fitting teams, all trained to the highest health and safety standards. Installations onto flat or pitched roofs and even onto the roof apex itself are common practice.

Midtherm Engineering has been installing high level commercial products for over 30 years and we pride ourselves on the quality and safe means by which we carry out our works. Our own installation and testing fully comply with Safe Contractor and CHAS and, as a further accolade, we are long time members of the Constructionline accreditation.

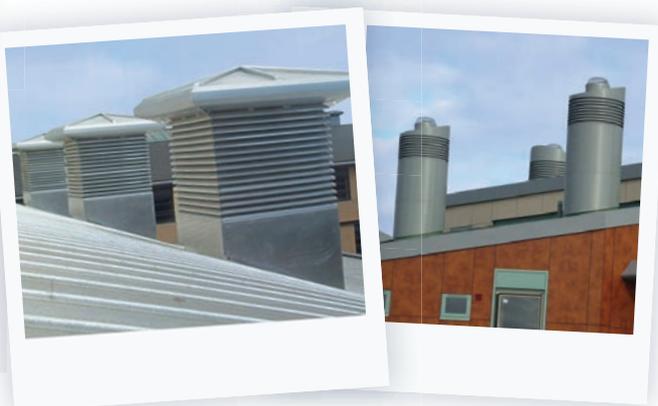
We undertake training matrices for each installer and renew and expand the safety knowledge year upon year. That way you can be sure of experienced safe working installers, completing great projects time after time.

The units are capable of being linked to the BMS or BEMS to ensure dampers close or open as directed by each local fire service in the event of a fire. Windvent units can be controlled via master control panels, room temperature sensors and CO₂ sensors. We also offer a manually operated system called 'Teleflex' where the dampers can be opened and closed by use of a rotating lever operated by the room occupants when required.



Bespoke Design

Individual design requirements can be met, as our Windvents are manufactured in-house.



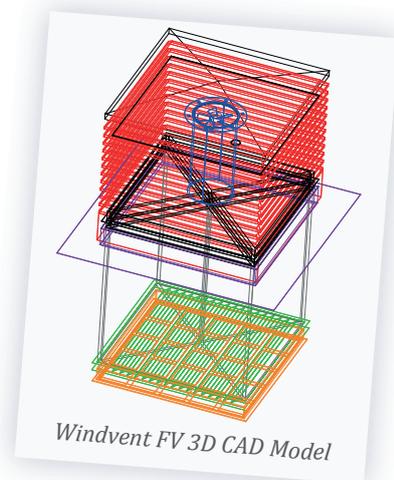
Technical Information

Terminal Specification

Terminals are constructed from type 1050 AH14 pure aluminium of 2mm thickness minimum, making them highly resistant to weathering and chemical attack. Internal cross dividers are also manufactured from corrosion resistant aluminium. The units are manufactured in accordance with BS EN ISO 9001. Airways are protected by the incorporation of bird proof mesh to the terminal louvres.

Insulation/Acoustics

Open cell foam having a minimum thickness of 12.5mm is used in preference to mineral wool/glass fibre insulation, as it does not shed fibres or release particulate matter. The selected foam offers favourable acoustic performance and meets the necessary fire performance criteria. Please see BSRIA Acoustic Report (summary below). Data sheets can be made available on request.



Windvent Controls

A sophisticated intelligent control system is used to regulate the Windvent(s) and provides the flexibility to control temperature, humidity, air quality and CO₂ levels using a single or multiple zone application. The clear digital display shows real-time sensor readings, set-points and the terminal damper percentage open position.

During the commissioning stage, minimum trickle ventilation settings, override functions and night cooling modes can all be set (also adjustable later should the client's requirements change). These settings are password protected via a four level access code system for security and to prevent unauthorised alterations.

The controllers can be linked to incorporate a common fire alarm override signal or to a local network with a master controller touch screen. Connection with other BMS systems is possible via a communications card to carry the protocol of the host LAN/BMS network.



Acoustic Report

Acoustic testing of the Windvent terminals has been conducted by BSRIA to identify the effects on sound dBA level in rooms benefiting from Windvent installation. Various acoustic materials can be introduced to suit the project requirements.

The report found that the ventilation system only raised the noise level 3.2dBA above ambient levels with the dampers fully open and by a negligible level when in the fully closed position.

We believe the heavy gauge, high density materials and acoustic products applied in our terminals currently lead the market in terms of performance.

Additionally, terminals can be lined on the internal trunk of the system using different thicknesses of the fire-rated material to suit any acoustic requirements even libraries can benefit from our site specific designs.



Introducing The Windvent SV

The Midtherm Windvent SV unit delivers the benefits of a combined air input and extract system, with the addition of an integral solar driven fan to increase air velocity on totally still summer days. The fan is powered by energy generated from the PV panels, built into the terminal roof, thereby minimising its carbon footprint.

Research has shown that an active stack system is preferable if climatic conditions are unfavourable or in buildings prone to high summer temperatures (due to having to keep doors, windows or skylights closed for health, safety or security reasons), therefore creating undesirable internal thermal and environmental conditions for the building occupants.

The pleasant increase in internal air velocities provided by the Windvent SV succeeds in boosting the potential of existing Windvent technology while utilising renewable energy and ensuring a comfortable working environment for occupants.

Maintenance

Maintenance of the Windvent SV terminal should be carried out annually via access to the terminal lid. The lid is lockable using the heavy duty, key operated, bolt action lock. Access to the gel battery and charge controller is possible via an access panel within the lid itself. The unit is designed and manufactured so that all components are accessible. We can alternatively mount these serviceable items in our specially designed solar wiring housing, located room side.

The Windvent SV roof-mounted solar array is positioned to enable as much daylight capture as possible.

Acoustics

The highly efficient low voltage fans now feature vibration free mounts and tubular silencers in each system, with the final adjustment to allowable noise tailored during commissioning by fan speed regulation.



Suitable applications for the Windvent SV include

Schools . Colleges . Universities . Offices . Workshops . Gymnasiums . Libraries . Study Areas . Kitchens . Bathrooms . Shower Rooms . Toilets . Changing Rooms . Store Rooms . Conference Rooms . Corridors . Stairwells . Reception Areas and many more...

Technical Information

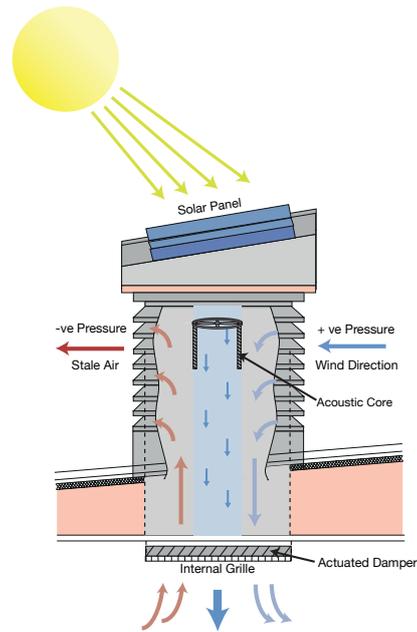
Windvent SV terminals house a fan to provide supplementary air. This fan is powered naturally by the solar panel situated on the lid of the Windvent. The PV solar panels capture solar energy which is then converted to electricity to power the fan's battery via the internal charge controller unit.

The addition of a fan transforms the passive stack terminal into an active stack unit where supplementary air can be forced into the system as necessary, to boost effectiveness in adversely still climatic conditions.

Prolonged periods without sun can be simply overcome with the provision of our mains battery back-up unit. These units monitor the battery's condition on a daily basis and can be switched to low tariff night time charging thus ensuring the optimum condition, ready for the day ahead.

Windvent SV units range in size from 600mm to 1500mm and are available as either square or circular

shaped terminals and are powder coated to the standard RAL colours of your choice giving a high colour finish for many years.



Why Choose Solar Vent?

The Solar Vent unit offers a low carbon footprint and therefore has little impact on the environment. All components have a 12 month parts and labour guarantee. Extended warranties are available for specific projects.

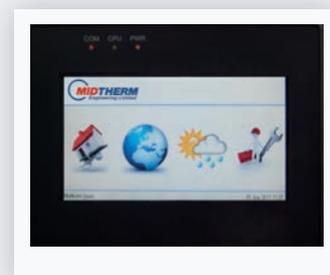
Control System

Our intelligent control system regulates the Solar Vent(s) and controls fan operation, humidity, temperature, air-quality and CO₂ levels.

The MID-IMC master controller shows real-time sensor readings, set-points and the terminal damper positions.

Minimum trickle ventilation settings, override functions and night cooling modes are set upon commissioning. Settings can allow manual adjustments by room occupants as deemed necessary.

The controller can be linked to a common fire alarm override signal or a local network with a master controller touch screen. Connection with other BMS systems is possible via MODbus RTU communications. Underfloor heating and other actuated devices, such as windows and Crossvent wall dampers, can also be controlled from the unit.



Introducing the Windvent FV

The Midtherm Windvent FV is an active stack terminal that combines the innovative design of the Midtherm Windvent system with an integral, hard wired fan to boost internal air velocities during hot summer temperatures, thereby improving the thermal conditions for room occupants.

Windvent FV Explained

The low powered fans are set as standard to simply switch on/off at fully open dampers or as an optional feature they can be speed controlled variably in conjunction with the damper positions.

Standard Components & Specifications

- Low powered 230v-24v fan unit - standard size of 270mm diameter with corresponding maximum airflow rates of 580l/s all supplementary to the naturally supplied Windvent volumes.



Dampers

Midtherm offers aluminium and uPVC damper options as part of the Windvent and Crossvent systems, providing efficient control of the air transfer through the units.

The aluminium blades are insulated and provide a low leakage, high performance volume control damper that operates quietly with low torque requirements.

The uPVC dampers offer very minimal cold bridging and low U values with reduced leakage rates.

Crossvents

Midtherm Crossvent Systems are wall mounted louvres that provide cross-ventilation for internal spaces. Air circulation is achieved through the use of high and low level louvres or in conjunction with roof mounted Windvents.

The Crossvent unit is housed in an insulated plenum with an external weather louvre to prevent rain ingress and an internal grille to facilitate the transfer of air through the system.

The flow of air is regulated by fully modulating actuator controlled dampers and various levels of attenuation can be accommodated to suit the client's requirements.

Introducing The Windvent VL

The Windvent VL unit delivers the benefits of a combined air input and extract Windvent system with the added incorporation of a Midtherm natural lighting system.

The vent part of the unit is an adapted Windvent that delivers a 'fresh air' supply to an office or workspace whilst simultaneously removing counter-productive CO₂ from the environment. The introduction of this 'fresh air' to a working environment has been proven to increase productivity and reduce staff sickness while providing substantial energy saving.

The natural lighting section is a reflective tube, which provides a constant source of natural light, comparable in its workings to traditional electrical lighting but without the drain on your electrical supply, again providing health benefits, countering the effects of SAD.

The Windvent VL's air flow performance is again controlled by a low voltage MID-2012 controller that monitors and adjusts input and extract ventilation rates accordingly. The Midtherm natural lighting unit is sealed so no dust or condensation can penetrate and is thermally enhanced by being encased in an acoustically lined conduit. Ventilation is provided via a choice of square or circular ceiling diffusers.

The Windvent VL is a highly versatile multi use product, providing natural ventilation and lighting together. It reduces building works and improves the thermal efficiency of a standard natural light system. Twice the product in a single design.



Suitable Applications For The Windvent VL Include

Schools . Colleges . Universities . Offices . Workshops . Gymnasiums . Libraries . Study Areas . Kitchens . Bathrooms . Shower Rooms . Toilets . Changing Rooms . Store Rooms . Small Conference Rooms . Corridors . Stairwells . Reception Areas

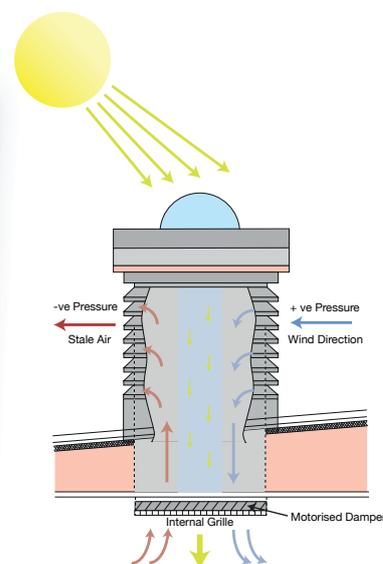
Midtherm Natural Lighting Systems

Midtherm natural lighting systems are designed to complement the Windvent by providing a constant source of free, natural light, therefore saving your business a significant amount in energy bills each year. The natural lighting system can be designed and installed to meet your aesthetic requirements.

Midtherm natural lighting systems require no maintenance. The unit is sealed so no dust can gather inside and is further insulated in the Midtherm class 'o' wrapped conduit. Condensation will not form inside the unit's dome due to the use of a brushed nylon gasket on installation. The unit can be used separately or integrated into a Windvent terminal.

Units comprise of a circular ceiling diffuser, reflective silverised aluminium tubes at 99.7% reflectivity, elbows, rooftop dome and roof interface flashings to suit all roof applications.

The systems are available as a 250mm (10") - suitable for corridors, shower rooms, small offices, changing rooms, store rooms, toilets and areas up to 7.5m². The 350mm (14") is more suited to kitchens, medium sized classrooms, study areas, libraries, small conference rooms, offices and landings. Our largest unit is 900mm (21") and is best suited to areas up to 40m². Multiple units are commonly installed for large rooms or halls.



Windvent Installations

Midtherm's natural ventilation range offers extensive solutions to buildings' ventilation and lighting requirements.

Midtherm's design department, contract engineers and site installation teams are highly experienced and ensure projects comply with all statutory requirements and British Standards. Technical data is readily available for all systems using proven computer-aided sizing programmes.

Our natural ventilation and lighting units are constructed in house. They are made from fully welded, corrosion-resistant aluminium and fitted with BSRIA tested internal acoustic and fire-resistant material. Adjustable modulating dampers and transfer grilles are manufactured from anodised aluminium or perforated stainless steel panels so they maintain weather integrity at all times.

All units are manufactured to BS EN ISO 9001 and may be powder coated to your specifications in a standard RAL colour of your choice. Windvent units are acoustically tested to BSEN 20140-10:1992, BS EN ISO 717-1:1997 and BS EN ISO 140-10:1991.



*NaturalVentilation*Systems



Other products available from Midtherm:

Flues Masts and Chimneys

Commercial Canopies

Industrial Fan Systems

X-Stream Systems

i-Window Systems

Intelligent Controls