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July 2018

passivent

ROOF VENTILATION TERMINALS

ROOF VENTILATION TERMINALS

Passivent offers a range of roof-mounted terminals, primarily for natural ventilation applications in commercial and larger residential buildings.

Airstract terminals are also available as combined daylighting and ventilation units in the form of Litevent and Sunstract (see pages 16 - 19).

Terminal sizing
Passivent is able to provide sizing of roof terminal products for your application using advanced airflow calculation software developed for Passivent and only available to Passivent customers.

Controls
There is a range of control modules for Airstract and Airscoop terminals, ranging from simple switches to intelligent control systems incorporating carbon dioxide sensors, weather stations, and BACnet capability.

The modulating actuators within the Passivent roof ventilation terminals are virtually silent in operation.

Contents

AIRSTRACT TERMINALS

Passivent Airstract is a range of roof-mounted natural ventilation terminals which combine low airflow resistance with high airflow capacity and excellent weatherability.

Airstract terminals can be used as part of a sustainable, low-energy, natural ventilation strategy to provide an exhaust outlet for used air. No power is consumed as natural forces move the air.

Airstract applications

Used for passive stack ventilation (PSV) applications in conjunction with Aircool® façade ventilators, they can ventilate deep plan spaces and provide night cooling. They can also be used for multiple extract applications and mechanical extract outlets.

Other options

Aluminium Airstract terminals, available in a larger range of sizes.

Airstract terminals with energy efficient mechanical assistance.

HYBRID PLUS AIRSTRACT TERMINALS

Passivent Hybrid Plus Airstract is a range of roof-mounted terminals which provide a range of additional options to the standard Airstract with an innovative air tempering and mixing unit utilising a single energy-efficient, low-power sweep fan (when required).

As well as in mixing mode, in unusual building occupancy events such as the generation of excessive CO_2 levels or excessive heat gains such as occasional high density occupation, the fan can also be activated to purge the space more rapidly than a passive ventilation system will allow. Alternatively it can still operate in passive stack mode still providing low-level resistance to airflow.

Hybrid Plus Airstract applications

Used for a range of ventilation applications particularly on upper floors of buildings where direct perimeter ventilation is limited or undesirable. Also suitable for large open buildings such as sports halls and auditoriums and can also be used for secure and weatherproof night cooling.

AIRSCOOP TERMINALS

Passivent Airscoop is a range of roof-mounted natural ventilation terminals which provide top-down or displacement ventilation using wind power alone.

Each unit is divided into four separate ducts internally so that wind from any direction is channelled down through the windward chamber(s).

This cooler, denser air flows down into the building, whilst warmer (and therefore lighter) air from inside is displaced upwards and out via the leeward chambers.

Airscoop applications

Particularly designed for large or deep-plan commercial buildings of up to two storeys, where direct perimeter ventilation is limited or undesirable.

DESIGN OPTIONS

Passivent Airstract and Airscoop terminals are available in a variety of shapes, finishes, colours and lid options. Our in-house manufacturing capability allows the designer flexibility to integrate terminals within a project or to emphasise the sustainable design of the building.

Modern (square and rectangular)
Modern terminals combine functionality and clean lines in a simple contemporary look. Alternatively they can be contrasted with a range of top designs to create a traditional or bespoke appearance. Suitable for all roof types from flat to 45° pitch.

Traditional (square)
Traditional terminals feature a decorative top making them suitable for long established buildings. Suitable for all roofs from flat to 45° pitch.

Bespoke
Bespoke designs are available to complement the roof finish and accentuate the roof design without affecting the performance or weatherability of the terminals.

Circular
Circular terminals offer a dramatic design alternative, suitable for all roofs from flat to 30° roof pitch. They use standard square base units for ease of flashing and to ensure weather integrity.

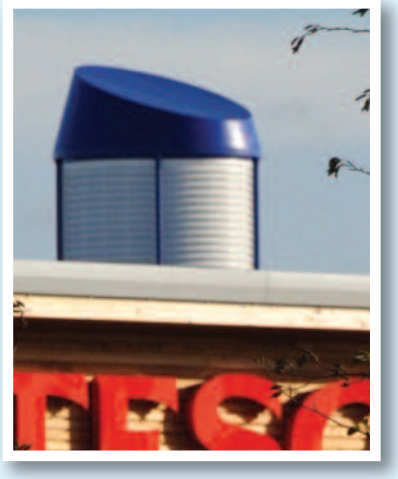
Circular terminals feature integral wind deflection posts to maximise their aerodynamic performance and ventilation effectiveness.

Wind can pass around smooth cylindrical shapes relatively uninterrupted, leading to a low ventilation effectiveness. Passivent terminals have vertical airflow deflector posts which project slightly from the louvres so as to disrupt the airflow around the terminal and cause early flow separation. This helps to increase the negative pressure on the leeward side, drawing more air through the louvres and thus improving the overall ventilation performance of the terminal.

Modern

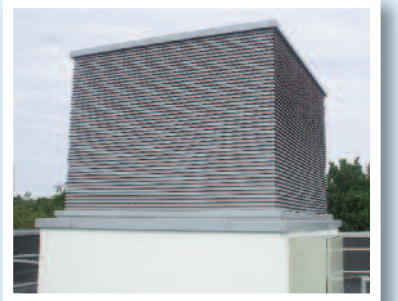
Traditional

Bespoke - mono pitch

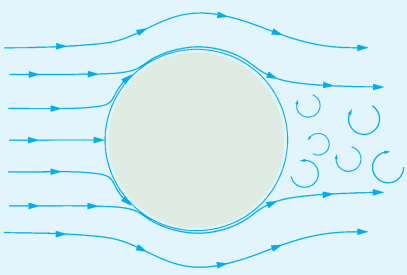


Bespoke

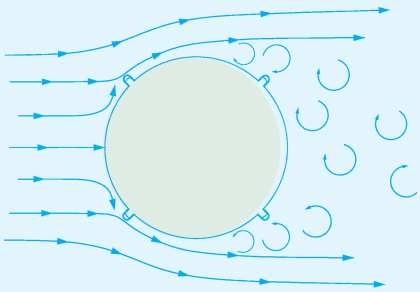
Circular



Aluminium



Smooth circular design



Passivent design with airflow deflector posts

PERFORMANCE

Performance data
Data from independent testing is available on request.

Coefficients of discharge
Based on double-bank louvres with base dampers

Airstract square/rectangular	0.57
Hybrid Plus Airstract	0.57
Airstract circular	0.54
Airscoop	not applicable

Wind resistance
Resistant to continuous wind loads at 51m/s, demonstrated by independent BRE tests.

Airtightness
Approx 9.7m^3/hr/m^2 at 50 Pa.

Fire performance
The aluminium Airstract Terminal has an EXT SAAX classification, independently tested to BS 476: Part 3.

Weather resistance
External louvres have been independently tested at BSRIA to BS EN 13030: 2001 'Performance testing of louvres subjected to simulated rain'.

Terminal and louvre type	Effectiveness to BS EN ISO 13030: 2001 at given inlet velocity airflow rate
Airstract, Hybrid Plus Airstract and Airscoop terminals, incorporating patented double bank louvres	
	Class A 100% at 0.00m/s
	Class A 100% at 0.50m/s
	Class A 99.71% at 1.00m/s
	Class A 99.06% at 1.50m/s
Aluminium Airstract, incorporating patented double bank louvres	
	Class A 100% at 0.00m/s
	Class A 100% at 0.50m/s
	Class A 99.3% at 1.00m/s
	Class B 97.0% at 1.50m/s

Biological resistance
Louvres exclude most birds in compliance with BRE Digest 415. 4mm insect screen behind the louvres excludes large insects.

Acoustic performance
Air intakes sited at roof level generally allow in less noise.
Acoustic treatment can be applied to Airstract and Airscoop systems to deliver planned acoustic attenuation performance, based on independent testing by Salford University.
For example:
Airscoop Basic systems up to 32dB ($D_{n,e,w}$).
Airscoop DAD systems up to 34dB ($D_{n,e,w}$).
Airscoop RAD ducted systems up to 42dB ($D_{n,e,w}$).

Durability and sustainability
External components are generally manufactured from aluminium or ABS, a robust and durable material proven in use on other exposed roofing products and in the automotive industry.

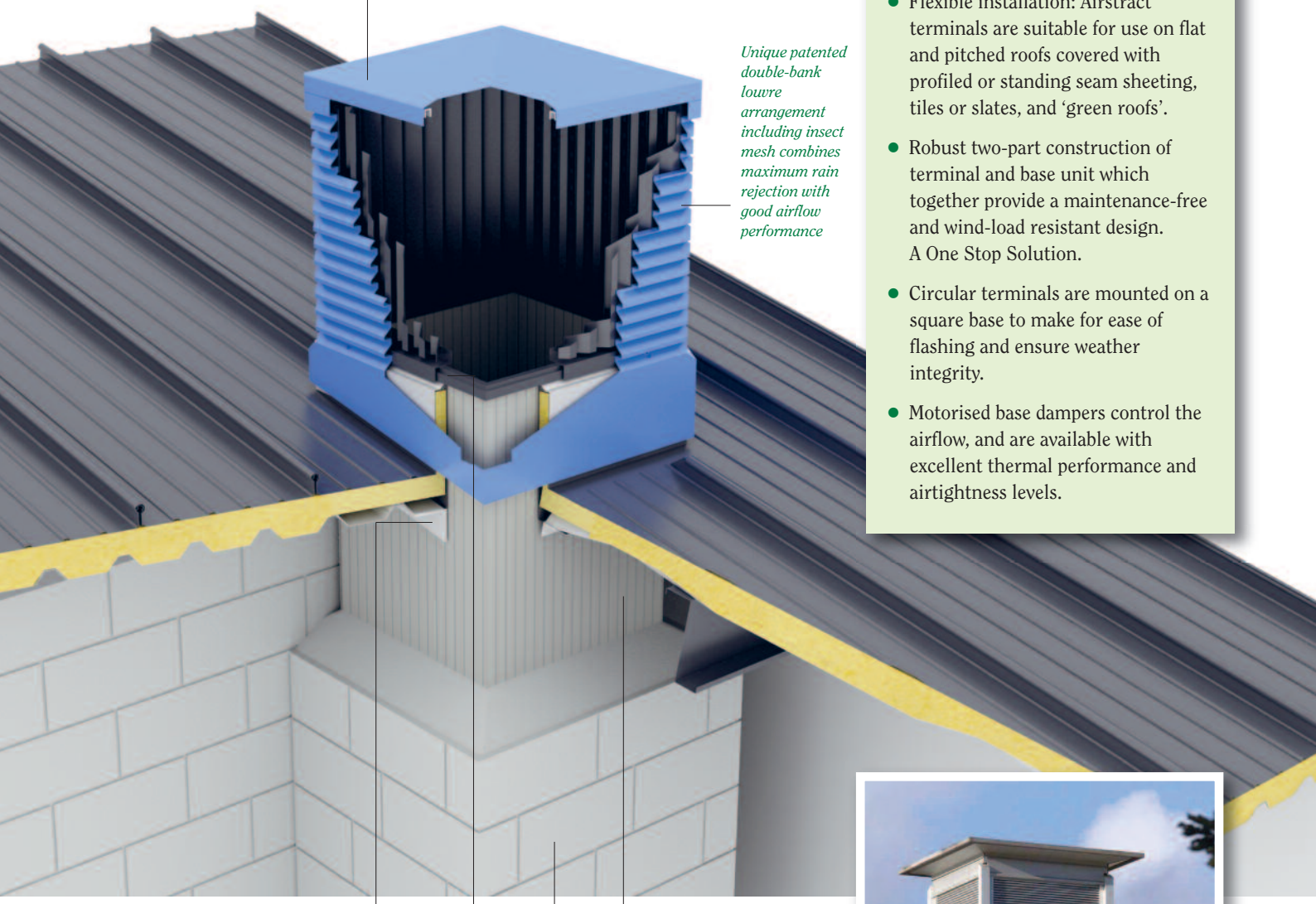
Airstract and Airscoop base units are produced from marine grade plywood sourced from managed forests.

Surface finish and colours
All exposed ABS surfaces are treated with UV-stable polymeric resin. Aluminium terminals are powder coated. All terminals can be colour matched to standard BS and RAL colours used for roof coverings. Plain, metallic or textured finishes are available that will complement most roof finishes.

AIRSTRACT TERMINALS

BENEFITS

- Environmentally friendly energy-saving natural ventilation - no power other than natural forces of buoyancy, wind and convection is required to move the air.
- Flexible installation: Airstract terminals are suitable for use on flat and pitched roofs covered with profiled or standing seam sheeting, tiles or slates, and 'green roofs'.
- Robust two-part construction of terminal and base unit which together provide a maintenance-free and wind-load resistant design. A One Stop Solution.
- Circular terminals are mounted on a square base to make for ease of flashing and ensure weather integrity.
- Motorised base dampers control the airflow, and are available with excellent thermal performance and airtightness levels.



Large terminals

For larger applications, bespoke Airstract terminals can be manufactured in aluminium (see Aluminium Airstract Terminal section). These provide even greater airflow performance whilst still featuring the patented double-bank louvres for maximum weather protection.

Sizes

Modern and traditional design terminals (up to 45° roof pitch)

Terminal sizes (mm)	Roof opening required (mm)	Geometric free area (m^2)	Equivalent free area (m^2)	Height** (mm)	Weight† (kg)
575 x 575*	485 x 485	0.157	0.136	818	40
575 x 800	485 x 710	0.246	0.214	818	52
575 x 1025	485 x 935	0.319	0.277	818	68
575 x 1250	485 x 1160	0.368	0.330	818	76
800 x 800*	710 x 710	0.386	0.335	1109	63
800 x 1025	710 x 935	0.525	0.456	1109	79
800 x 1250	710 x 1160	0.625	0.543	1109	91
1025 x 1025*	935 x 935	0.716	0.622	1350	95
1025 x 1250	935 x 1160	0.906	0.787	1350	105
1250 x 1250	1160 x 1160	1.030	0.895	1391	116

Circular terminals (up to 30° roof pitch)

Diameter (mm)	Roof opening†† required (mm)	Geometric free area (m^2)	Equivalent free area (m^2)	Height** (mm)	Weight† (kg)
1100	710 x 710	0.382	0.282	1141	87
1400	935 x 935	0.700	0.516	1363	134
1700	1160 x 1160	1.030	0.760	1583	162

** Traditional terminals are only available in these sizes.*

*** Height figures are based on 0° roof pitch.*

† Weight figures are based on 0° roof pitch and include the weight of the standard double-banked terminal and square base of 1000mm in length. Weights are correct at time of going to print, but contact Passivent for current figures.

†† Circular terminals have a square roof opening.

Coefficient of discharge, see Performance section.

Note; The weights and free area do not include the optional base damper.

Specification clause

Provide ventilation by means of Passivent Airstract ventilation terminals supplied by Passivent, North Frith Oasts, Ashes Lane, Hadlow, Kent TN11 9QU. Telephone: 01732 850770. Fax: 01732 850949. Email: projects@passivent.com.

Airstract terminals to have been appraised under BS EN ISO 9001. Terminal cladding and louvres manufactured from high-impact ABS and connected to a base unit of marine grade plywood from renewable forests. Resistant to wind loads up to 51m/s, fitted with 4mm insect screen.

Double-bank louvres to achieve 100% rain rejection, class A effectiveness.

Terminal width ……mm, length ……mm, ventilation area ……mm^2, roof pitch ……

Colour and texture …… to match roof covering of …… tiles/slates/sheeting*.

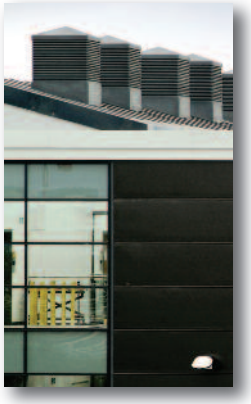
Multiple outlets: …… [give details]

*i*AT fan installed in terminal .*

Motorised base damper with internal cover grille.*

*Delete as applicable

AIRSTRACT *i*AT TERMINAL



Description

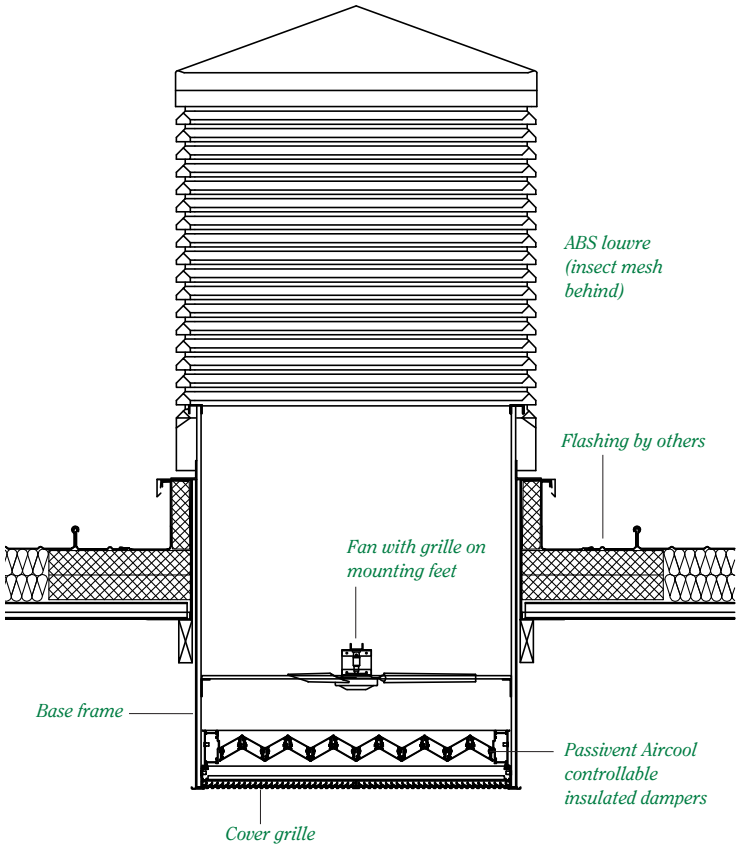
During peak summer temperatures, the minimal temperature difference between indoors and outside can result in low flow rates for passive stack ventilation, especially on still windless days.

During these periods or at other times of unusual events, such as high occupancy or unusual heat gain, the building will suffer from raised temperatures or higher than normal CO_2 levels leading to reduced air quality and lethargy for the room occupants.

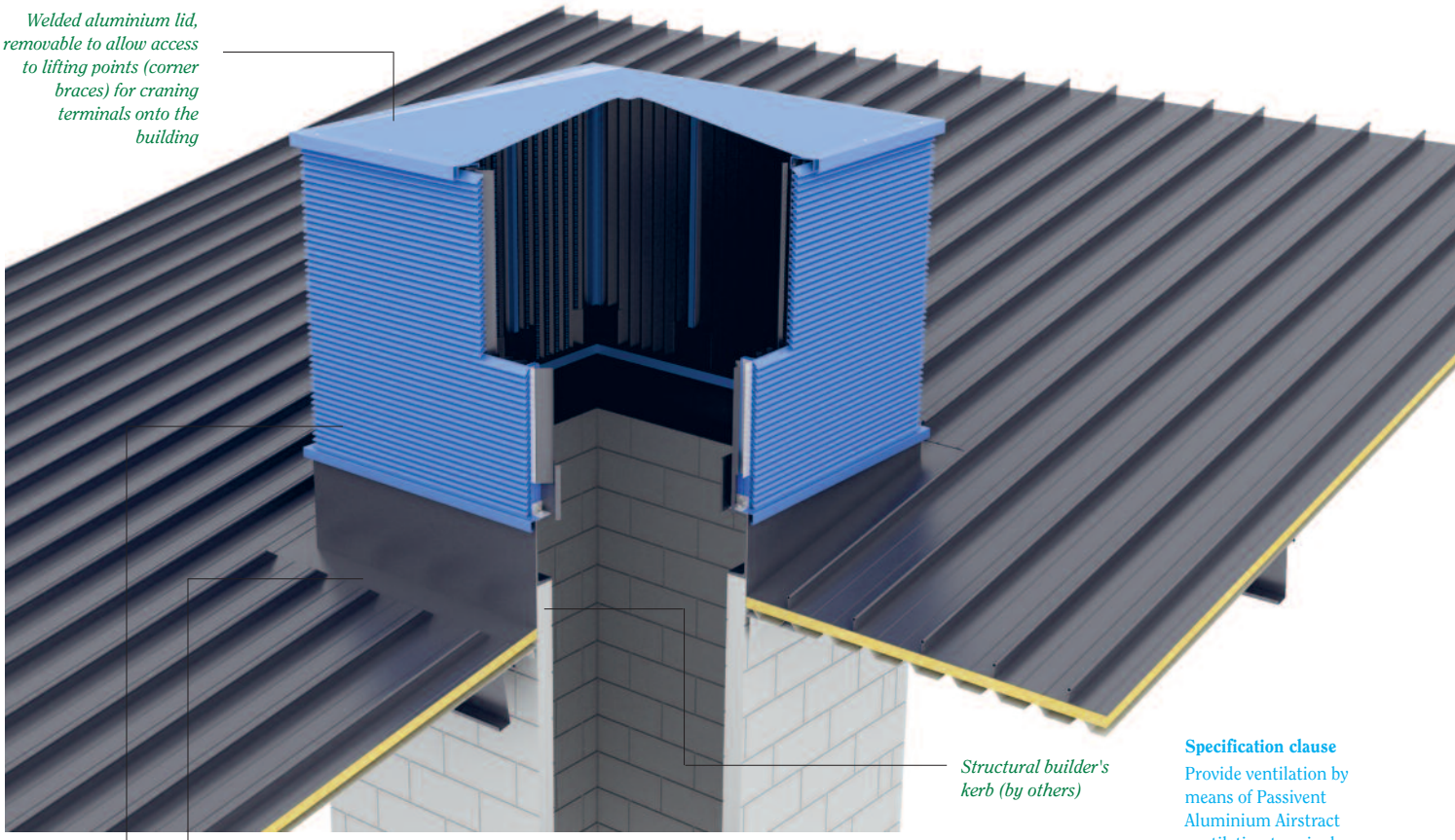
These changes in internal conditions can be identified by the Passivent Intelligent Control System which activates the low energy fan. The fan generates a change in internal pressure which maintains the ventilation system performance until either the temperature or CO_2 levels have achieved the targeted set point.

Performance

Maximum flow rate when inlet and outlet resistances are equal and fan is in operation: 580 l/s.



ALUMINIUM AIRSTRACT TERMINAL



Description

The Aluminium Airstract is a roof mounted terminal which provides an exhaust for warm air.

It combines high airflow capacity with low airflow resistance and patented double-bank weather louvres.

Available in a larger size range than the standard Airstract.

Construction

Louvres are extruded aluminium with mitred corners, powder coated to a standard RAL colour to match roof covering. Welded aluminium lid. Removable lid allows access to lifting points (corner braces) for craning terminals onto the building.

Sizes

Terminal dimensions (mm)	Geometric free area (m^2)	Equivalent free area (m^2)	Height* (mm)	Builder's kerb dimensions internal (mm)	external (mm)
813 x 813	0.33	0.36	680	577 x 577	837 x 837
813 x 1113	0.50	0.55	680	577 x 877	837 x 1137
1113 x 1113	0.76	0.85	900	877 x 877	1137 x 1137
1113 x 1412	1.03	1.13	900	877 x 1176	1137 x 1436
1412 x 1412	1.38	1.51	1208	1176 x 1176	1436 x 1436
1412 x 1787	1.82	2.00	1208	1176 x 1551	1436 x 1811
1787 x 1787	2.41	2.64	1582	1551 x 1551	1811 x 1811
1787 x 2012	2.75	3.02	1582	1551 x 1776	1811 x 2036
2012 x 2012	3.15	3.46	1740	1776 x 1776	2036 x 2036

Coefficient of discharge, see Performance section.
Contact Passivent for Aluminium Airstract terminal weights.
Other sizes are available on request. Please email projects@passivent.com for more information.
** Heights are based upon a flat builder's kerb (by others).*

Specification clause

Provide ventilation by means of Passivent Aluminium Airstract ventilation terminals supplied by Passivent, North Frith Oasts, Ashes Lane, Hadlow, Kent TN11 9QU. Telephone: 01732 850770. Fax: 01732 850949. Email: projects@passivent.com.

Terminals to have been appraised under BS EN ISO 9001.

Louvres to be extruded aluminium with mitred corners, EXT SAAX classification to BS 476: Part 3, fitted with 4mm insect screen.

Louvres double-bank to achieve 100% rain rejection, class A effectiveness .

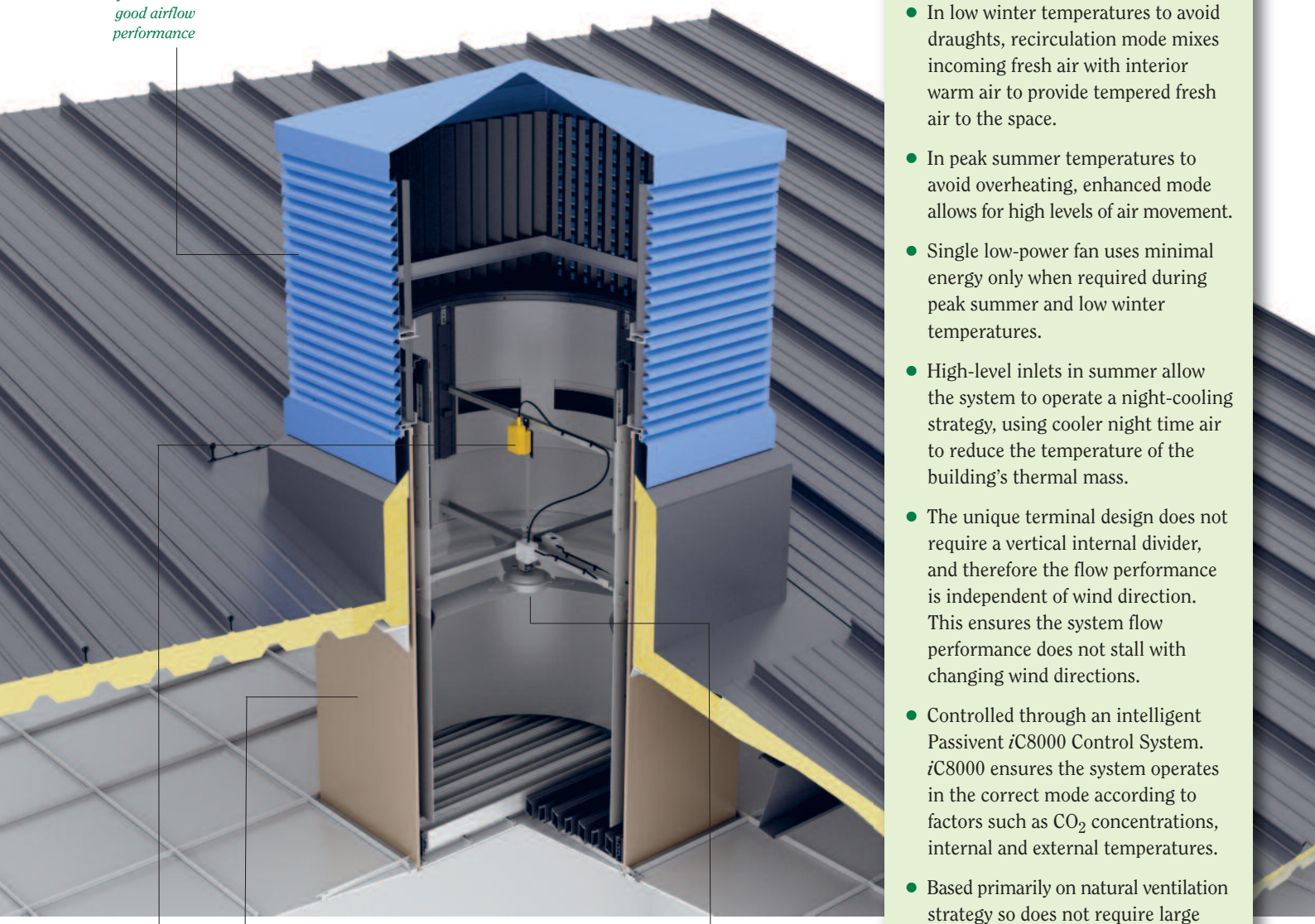
Terminal width ……mm, length ……mm, ventilation area ……mm^2,

Colour to match your roof covering.

Terminal to be mounted on a structural builder's kerb by others; all necessary flashings, secret gutters etc to be provided and installed by others.

*Delete as applicable

HYBRID PLUS AIRSTRACT TERMINAL



Installation

Hybrid Plus Airstract Roof Terminal comprises two main elements: the sub-base unit, which houses the insulated and modulating damper, mixing chamber and fan, and the terminal which provides the weatherproof and low resistance outlet/inlet. The sub-base unit is fixed to the structure to support the terminal. It is supplied with the necessary fixing brackets and can be used on flat roofs or builders' kerbs. The louvred terminal is fixed in position over the sub-base assembly.

Dimensions

Terminal: 1250 x 1250mm
Roof opening required: 1160 x 1160mm
Height, standard modern terminal: 1391mm
Weight: Terminal base with mixing chamber 100kg. Terminal 50kg. Louvre 50kg.

Colour

Base unit: white clad below roof line.
Ceiling cover grille: white as standard, or any standard RAL/BS colour.

BENEFITS

- A number of different modes can be programmed to allow the most energy efficient option to be used as and when required.
- In low winter temperatures to avoid draughts, recirculation mode mixes incoming fresh air with interior warm air to provide tempered fresh air to the space.
- In peak summer temperatures to avoid overheating, enhanced mode allows for high levels of air movement.
- Single low-power fan uses minimal energy only when required during peak summer and low winter temperatures.
- High-level inlets in summer allow the system to operate a night-cooling strategy, using cooler night time air to reduce the temperature of the building's thermal mass.
- The unique terminal design does not require a vertical internal divider, and therefore the flow performance is independent of wind direction. This ensures the system flow performance does not stall with changing wind directions.
- Controlled through an intelligent Passivent *i*C8000 Control System. *i*C8000 ensures the system operates in the correct mode according to factors such as CO_2 concentrations, internal and external temperatures.
- Based primarily on natural ventilation strategy so does not require large and costly mechanical plant.

Specification clause

Provide ventilation by means of Passivent Hybrid Plus Airstract terminals supplied by Passivent, North Frith Oasts, Ashes Lane, Hadlow, Kent TN11 9QU. Tel: 01732 850770. Fax: 01732 850949. Email: projects@passivent.com. Passivent Hybrid Plus Airstract terminals appraised under BS EN ISO 9001. Terminal cladding and louvres manufactured from high-impact ABS with integral low energy fan and controllable inner shaft to enable mixing of air, night cooling and passive ventilation, connected to a base unit of marine grade plywood from renewable forests. Resistant to wind loads up to 51m/s, fitted with 4mm insect screen. Louvres double-bank to achieve 100% rain rejection, class A effectiveness. Dimension 1250 x 1250mm. Colour and texture … to match roof covering of… tiles/slates/sheeting*. Motorised base louvre with white internal cover grille.

*Delete as applicable

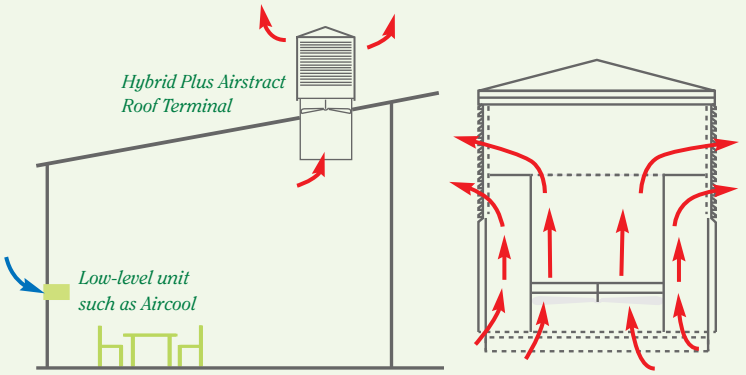
Single-space system, 3 operating modes

The system uses one of three operating modes depending on the needs of the building and outside temperatures.

Mode 1 Natural

Most of the year

In natural mode the Hybrid Plus Airstract Roof Terminal acts as a passive stack. Fresh air enters the space via low level air inlets, for example Passivent Aircool ventilators, or opening windows. Warm air rises and is exhausted at high level through the Hybrid Plus Airstract Roof Terminal.
This is a purely passive mode and the fan does not operate. This mode enables control over indoor air quality and temperatures.



Duct actuator fully open.
Air path to terminal outside of the duct but no mixing available.

Fan direction: Stopped

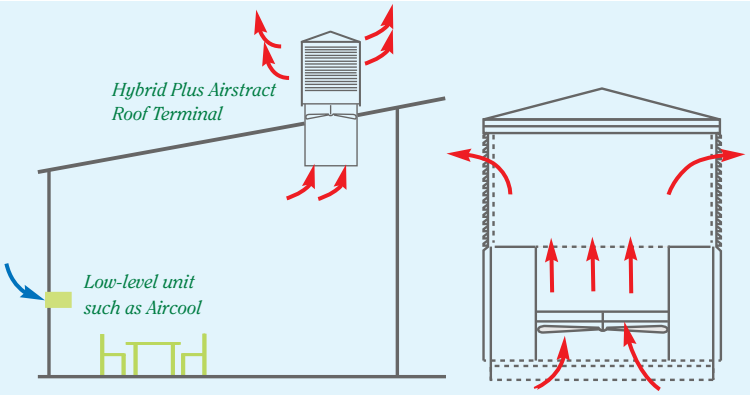
Sub-base damper modulating

This strategy requires a low-level inlet such as an Aircool unit

Mode 2 Enhanced

Peak summer temperatures

To avoid overheating within the room, the single low power fan in the Hybrid Plus Airstract terminal extracts high volumes of air from the space and exhausts it to the outside. Fresh air is brought in through low-level air inlets. This mode allows the ventilation rate to be increased to control peak summer temperatures.



Enhanced (air extracts)

Duct actuator fully closed.
Air path to terminal outside of the duct fully closed.

Fan direction: Reverse

Sub-base damper open

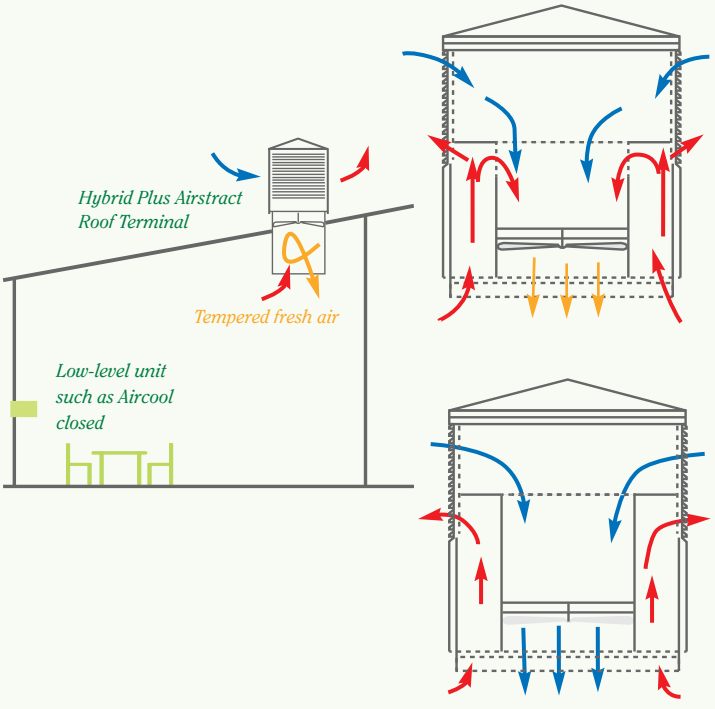
This strategy requires a low-level inlet such as an Aircool unit

Mode 3 Recirculation

Low winter temperatures; summer night cooling

Low-level air inlets are closed, preventing cold draughts. Fresh air is brought in at high level through the Hybrid Plus Airstract terminal. With the fan running, the incoming fresh air mixes with interior warm air in the Hybrid Plus Airstract mixing chamber, providing tempered fresh air to the room.
During unoccupied periods when the air inlets are closed and the temperature rises, the Hybrid Plus Airstract terminal both supplies and exhausts air.
This ensures a fresh environment when the room is occupied again.

The same strategy can be used for secure night cooling in summer especially if there are no low-level inlets or to open them would present a security risk.



Recirculation
Duct actuator modulates between fully open and fully closed.
Air path to terminal outside of the duct open. Maximum mixing occurs at mid point of travel.

Fan direction: Forward

Sub-base damper modulating

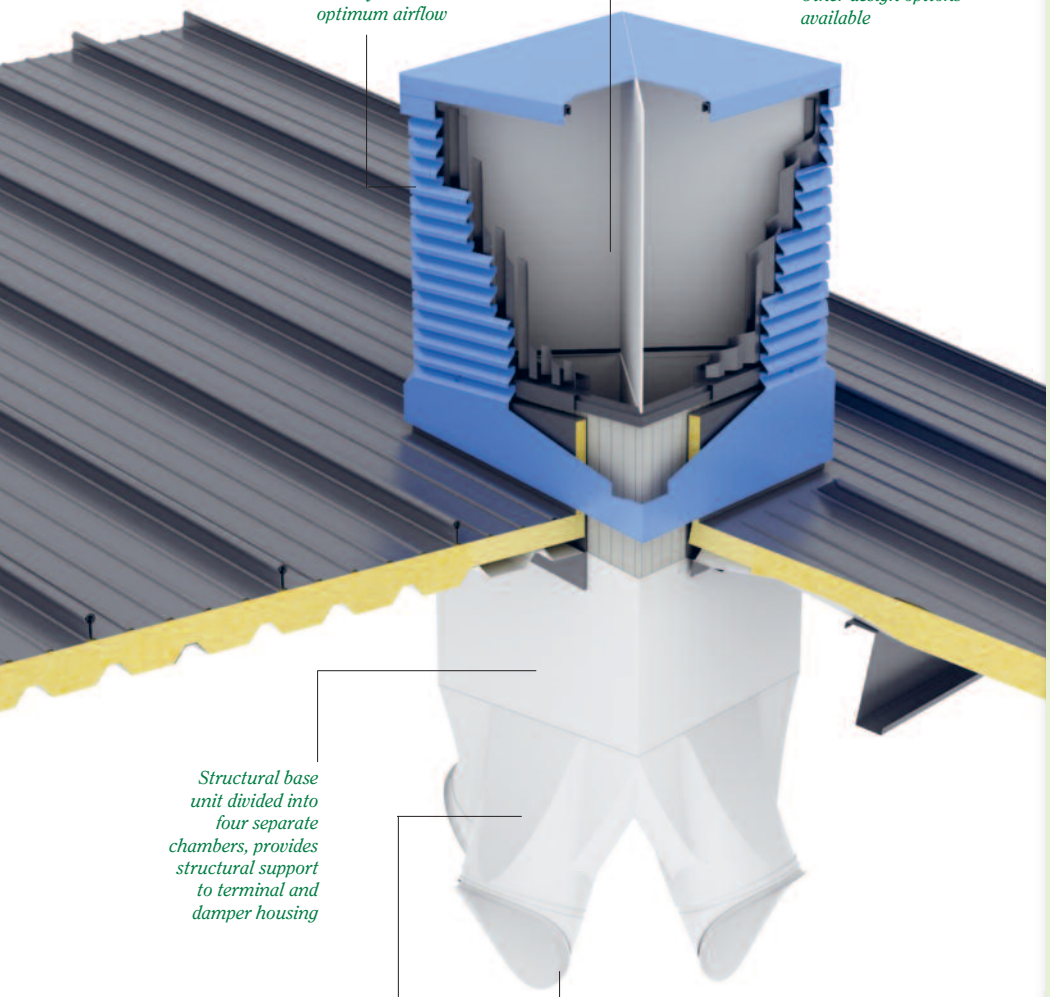
Recirculation and enhanced (air in and air extract)

Duct actuator fully open.
Air path to terminal outside of the duct open but no mixing available.

Fan direction: Forward

Sub-base damper modulating

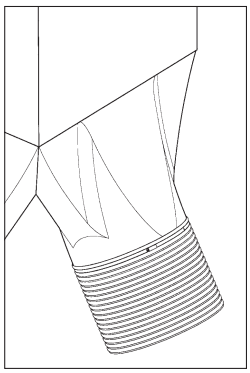
AIRSCOOP TERMINALS



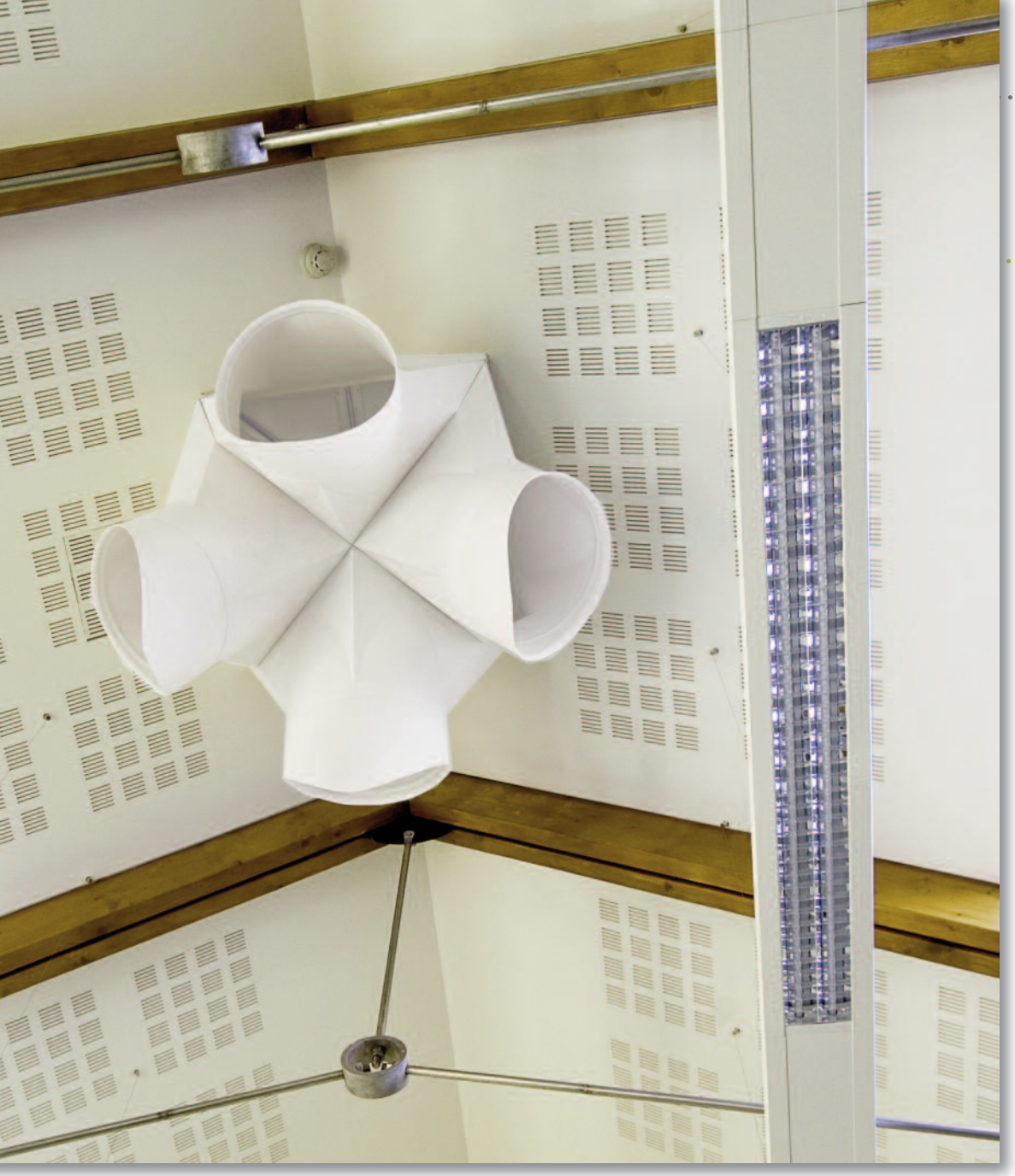
BENEFITS

- Environmentally friendly energy-saving natural ventilation; no power is required to move the air. Can reduce or eliminate the capital and running costs of ventilation or air conditioning plant.
- Range of systems: basic, enhanced DAD or enhanced RAD.
- On enhanced systems, four automatically controlled dampers regulate airflow according to ambient conditions.
- Optimised segmented design combined with unique computational fluid dynamics (CFD) designed inlets/outlets delivers maximum airflow capacity with minimal pressure drop through the system.
- Complete separation of chambers where they exit the Airscoop prevents 'short-circuiting' of inward and outward air flows within the building.
- Unique and purpose-designed software based on field testing has been developed with EDSL/Tas to calculate the ventilator sizes required for the application.

EDSL Tas



Fixed ceiling grilles and ductwork connected to inlet/outlet for RAD application



Specification clause

Provide ventilation by means of Passivent Basic/DAD/RAD* Airscoop roof-mounted ventilation terminals with automatic damper control, supplied by Passivent, North Frith Oasts, Ashes Lane, Hadlow, Kent TN11 9QU. Telephone: 01732 850770. Fax: 01732 850949. Email: projects@passivent.com.

Terminals to have been appraised under BS EN ISO 9001.

Terminals of high-impact ABS with all exposed surfaces treated with UV-stable polymeric resin, base of marine grade plywood.

Weather performance tested to BS EN 13030 'Performance testing of louvres subjected to simulated rain': double-bank louvres Class A 100% at 0.00m/s, Class A 100% at 0.50m/s.

Thermal insulation U-value 1.6W/m²K when basic dampers are closed, resistant to continuous wind loads at 51m/s, 4mm insect screen.

Colour and texture …… to RAL / BS colour …… or to match roof covering.

*Delete as required

Sizes

Modern and traditional design terminals (up to 45° roof pitch)

Terminal sizes (mm)	Roof opening required (mm)	Height** (mm)	Weight† (kg)
575 x 575*	485 x 485	818	69
800 x 800*	710 x 710	1109	110
1025 x 1025*	935 x 935	1350	166
1250 x 1250***	1160 x 1160	1391	209

Circular terminals (up to 30° roof pitch)

Diameter (mm)	Roof opening†† required (mm)	Height** (mm)	Weight† (kg)
1100	710 x 710	1141	128
1400	935 x 935	1363	197
1700***	1160 x 1160	1583	246

** Traditional terminals are only available in these sizes.*

*** Height figures are based on 0° roof pitch.*

**** Basic Airscoop system only in this size.*

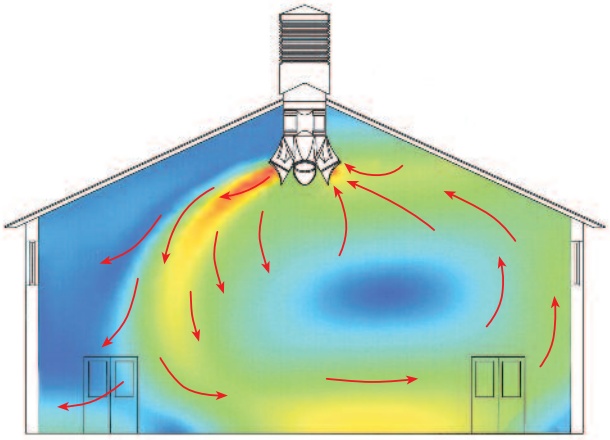
† Weight figures are based on 0° roof pitch and include the weight of the standard double-banked terminal and square base of 1000mm in length. Weights are correct at time of going to print, but contact Passivent for current figures.

†† Circular terminals have a square roof opening.

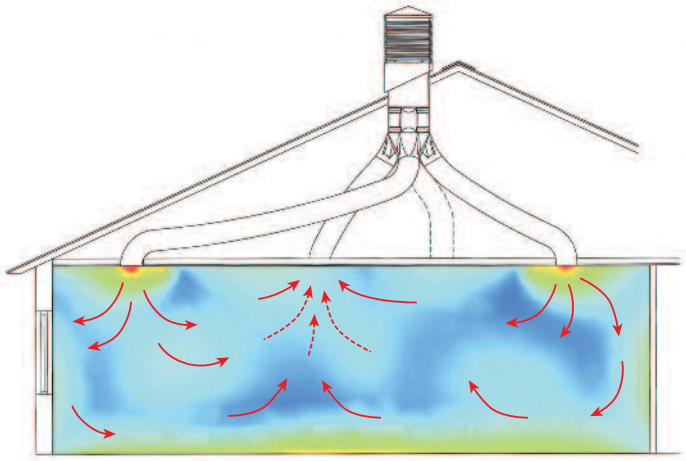
AIRSCOOP SYSTEMS

Enhanced Airscoop systems

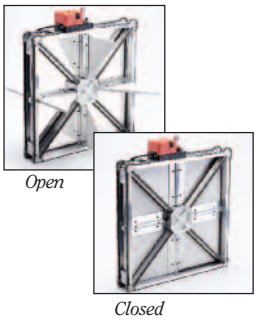
Direct Air Dispersal system (DAD)
Suitable for buildings with large open voids where there is no intermediate ceiling, such as sports, concert and meeting halls, factory spaces, warehouses etc. The four separate air inlets/outlets on the Enhanced Airscoop ensure that the airflow is always separated regardless of wind direction. This also provides much improved distribution and mixing of air preventing 'short-circuiting' at the unit. The patented system has been designed to optimise the flow characteristics within the Airscoop, keeping pressure losses to a minimum.



Remote Air Dispersal (ducted) system (RAD)
Suitable for all building types with intermediate ceilings such as offices and classrooms. The system utilises the same Airscoop design as above but the inlets/outlets are connected via flexible ductwork to four diffusers in the ceiling of the ventilated space. This ensures effective air distribution within the space and enables the ceiling diffusers to be sited for maximum benefit in relation to space utilisation. The ductwork losses have been minimised, allowing runs up to 10m to be used. Since airflow is controlled within the Airscoop, ductwork only needs to be insulated when running through cold voids.



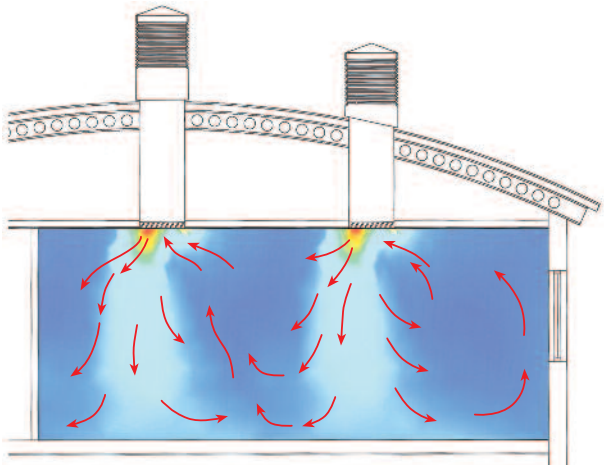
Insulated volume control dampers
Enhanced systems incorporate unique patented four-way dampers for high-efficiency airflow either direct or remotely via ductwork.


Open

Closed

Basic Airscoop systems

The Basic system is suitable for use in buildings with and without intermediate ceilings. The air is ducted down from the Airscoop to controllable double skin aluminium louvres with ABS thermal break through a diffuser grille mounted within the ceiling or base unit for controlling airflow directly into the occupied space. The dampers ensure that draughts under the outlets are minimised, especially important in spaces occupied during the day. The angle of the louvres also assists in spreading the airflow within the ventilated space.



RESEARCH

Silsoe Research Institute flow test laboratory measuring airflow performance of Airscoops

Sonic anemometers monitoring wind flow and direction within an Airscoop

Data logger/collection of wind speed and flow and temperature

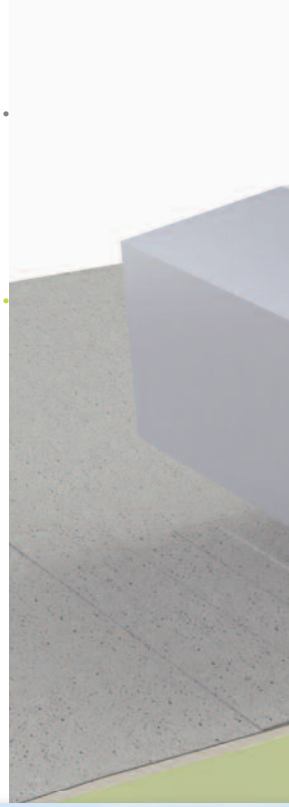
Mast monitoring wind speed and direction at Holymoorside School

Passivent has been a major partner in the BSRIA-chaired PiI research project 'Wind Driven Natural Ventilation Systems'. The BSRIA guide BG2/2005, which is the major output of the project, confirms the principles by which Airscoop type systems work and provides guidance on their use. It highlights the importance of key design parameters such as driving rain resistance and optimised flow characteristics following extensive wind tunnel testing and analysis of installed systems in the field.

Passivent has also invested heavily in further applied research at Silsoe Research Institute over a period of three years. Airscoop systems have been monitored both in the field and in the unique flow test laboratory. The research has also focused on the performance of the ventilation delivery and the distribution and mixing of airflows. This has been linked back to CFD modelling of the flow characteristics both in building spaces and within the Airscoop unit itself. This has led to the development of the patented Enhanced Airscoop systems incorporating the unique four-way damper device and triangular-to-round inlets/outlets.

TAS Airscoop Builder is a new utility for modelling Airscoop roof-mounted ventilation terminals and their benefits to building performance. TAS is a building thermal analysis tool commonly used for calculating energy consumption and assessing peak summer temperatures.
For more information visit www.edsl.net

LITEVENT AIRSTRACT ROOFLIGHT/VENTILATOR



The Litevent combines a controllable ventilator and a rooflight, for installation on flat or low-pitched roofs. It is designed to contribute to reduction of energy demand in commercial buildings.

BENEFITS

- Combines natural ventilation and natural daylighting functions in one unit.
- Provides controllable ventilation with minimal energy consumption.
- Reduces the need for artificial lighting, thereby further reducing energy expenditure.
- Thermally insulated upstand and triple-skin glazing minimise heat loss.
- Height of upstand will accommodate both warm and cold deck constructions without the need for an additional timber kerb.

Composition

Aluminium upstand with insulated core, incorporating insulated ventilation doors on all four sides, controlled by linked actuators (24V modulating). Weather cowl is mill finish aluminium, and has an aluminium insect screen.

Rooflight has triple-skin 3mm to 4mm polycarbonate glazing with vented air gap, in an extruded aluminium frame with mitred and secret-welded corners. Glazing has a 10-year postformed warranty from the material sheet supplier against yellowing and loss of light transmission, and for impact resistance.

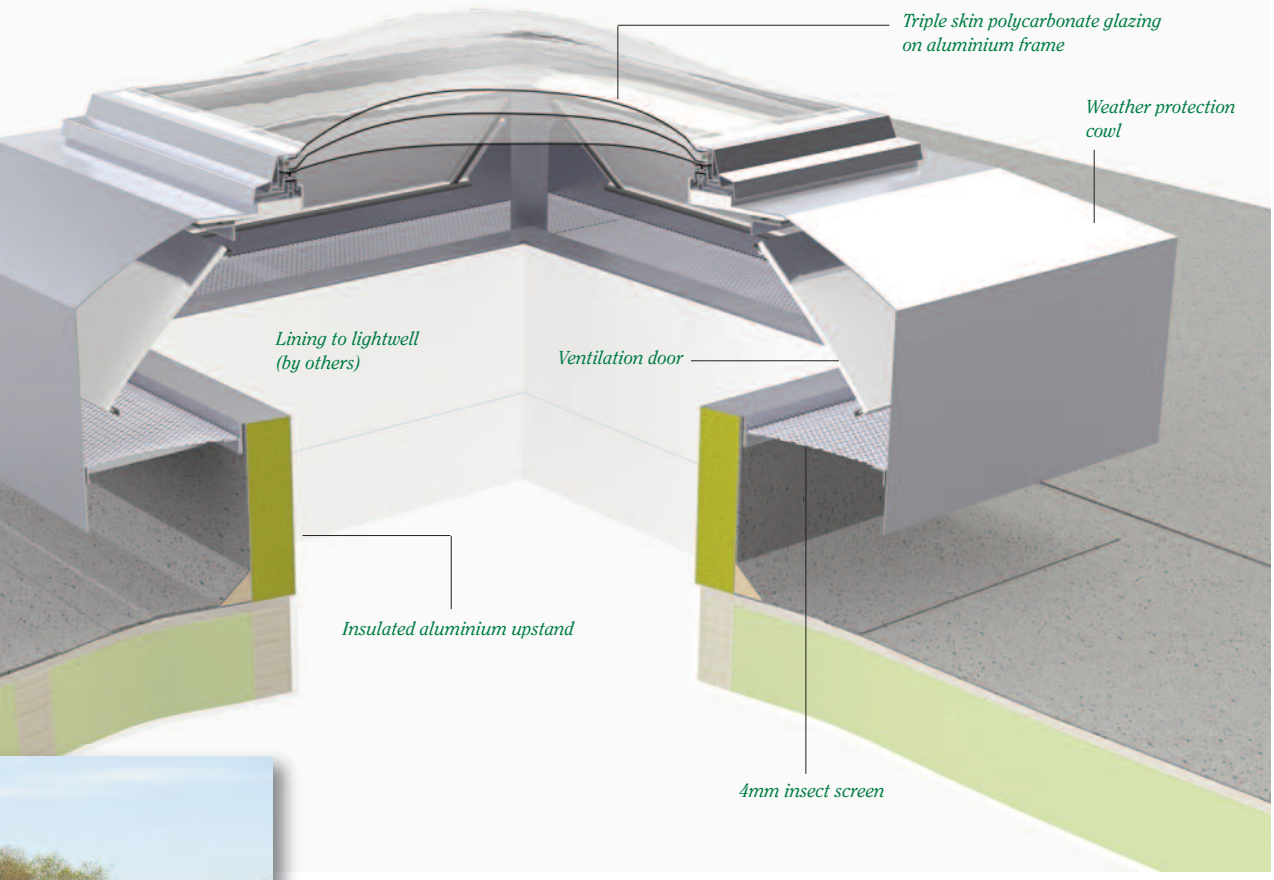
Sizes

Litevent size* (mm x mm)	Daylight area (m^2)	Ventilation geometric free area (m^2)
600 x 600	0.270	0.550
750 x 750	0.448	0.630
900 x 900	0.672	0.690
1050 x 1050	0.941	0.770
1200 x 1200	1.254	0.860
1200 x 900	0.918	0.770

*Roof opening size

Appearance

Aluminium upstand and glazing frame are mill finish as standard. Frame can be supplied polyester powder coated to order.
Cowl is aluminium, mill finished as standard.
Glazing is clear, diffused or bronze.
Shape: dome.
Internal surfaces finished in white for maximum light reflectance.



PERFORMANCE DATA

Ventilation performance
Maximum ventilation area: see sizes table. Passivent can advise on the size of Litevent Airstract terminal in relation to volume of air movement required, likely external conditions and internal temperatures. Cd value = 0.77.

Data from independent testing is available on request.

Impact strength
The unit has been subjected to large, soft-body impact testing by BRE and may be considered non-fragile to HSG 33. It will resist a soft-body impact of at least 1200 Joules.

Fire spread: internal and external
Ratings to BS 476: Part 7: 1987 are Class 1 for internal surfaces of the upstand and frame, and Class 1Y for the polycarbonate glazing.

Under Building Regulations Approved Document B4 paragraph 15.7, a polycarbonate rooflight with a Class 1 rating may be regarded as having an AA designation for external fire spread.

By virtue of the above performance, under Approved Document B2 Table 11 and B4 Section 14, Litevent ventilators can be used without restriction on size or spacing in all types of occupiable and circulation space except protected stairways.

Weather resistance
Driving and deluge rain resistance demonstrated by test.

Biological resistance
4mm screen in cowl excludes large nesting insects.

Thermal insulation
The upstand and triple-skin glazing give good thermal insulation and minimise the risk of condensation. Our Technical Department can provide computer calculations of U-values for given sizes in different roof constructions to comply with Building Regulations Part L 2013.

Light transmission
For daylight areas see dimensions table. Average visible light transmission for 3mm glazing: clear 92%, diffused 85%, and bronze 50%. G-values: clear = 0.59, diffused = 0.56 and bronze = 0.43.
Clear glazing allows the greatest amount of daylighting, making it ideal when seeking passive solar gain. Diffused glazing diffuses the light and cuts down shadows and bright spots. Bronze glazing provides a good combination of light transmission with greater control of passive solar gain.

Specification clause

Provide controllable ventilation combined with rooflighting by means of Litevent Airstract ventilators.
Supplier: Passivent, North Frith Oasts, Ashes Lane, Hadlow. Kent TN11 9QU
Telephone: 01732 850770, Fax: 01732 850949.
Email: projects@passivent.com
Ventilator to comprise mill finish aluminium upstand with insulated core, aluminium cowl, vents and insect screen. Internal surfaces white. Glazing triple skin 3mm to 4mm polycarbonate with ventilated air gap in extruded aluminium frame with mitred and secret-welded corners. Glazing to have 10-year postformed warranty from the material sheet supplier against yellowing and loss of light transmission, and for impact resistance.
Glazing frame polyester powder coated, colour .... Glazing clear/ diffused/bronze, shape: dome.
Ventilator size: ...mm²
Ventilator to be resistant to soft-body impact of 1200 Joules; classed as non-fragile to HSG 33; internal fire spread rating Class 1Y, external fire spread designation AA.
*Delete as applicable.

SUNSTRACT ROOFLIGHT/VENTILATOR

The Sunstract combines controllable natural ventilation with the ability to provide natural daylight, meaning the product can contribute to the reduction of energy demand in commercial buildings.

Sunstract system under test in real daylight conditions with integrator box at base

BENEFITS

- Combines natural ventilation and natural daylighting functions in one unit.
- Provides controllable ventilation with high lumen output.
- 885mm square ducted system for greater structural stability and light output.
- Structural sub-base provided for ease of installation and weathering into a wide range of roof coverings.
- Diffused glazing reduces 'hot spots' and spreads the light for ducting down the system.
- Reduces the need for artificial lighting or ventilation, also reducing energy costs.
- Thermally insulated upstand to minimise energy losses.
- Double or triple glazing to minimise heat loss.

Composition

3mm to 4mm polycarbonate double or triple skin glazing, formed with a dome or pyramid finish. Glazing has a 10 year postformed warranty from the sheet supplier against yellowing and loss of light transmission, and for impact resistance.

External weather louvres manufactured from extruded aluminum with a 30mm pitch.

Insulated controllable louvres with 24V modulating actuators.

Marine grade plywood structural sub-base lined with 98% reflective material.
The sub-base offers a secure roof fixing up to 51m/s wind speed and is independently tested by the BRE.

A frosted recessed diffuser suspended within the ceiling adaptor has an adjustable sleeve to accommodate variations in final duct length. Suitable for use in plasterboard and suspended ceilings.

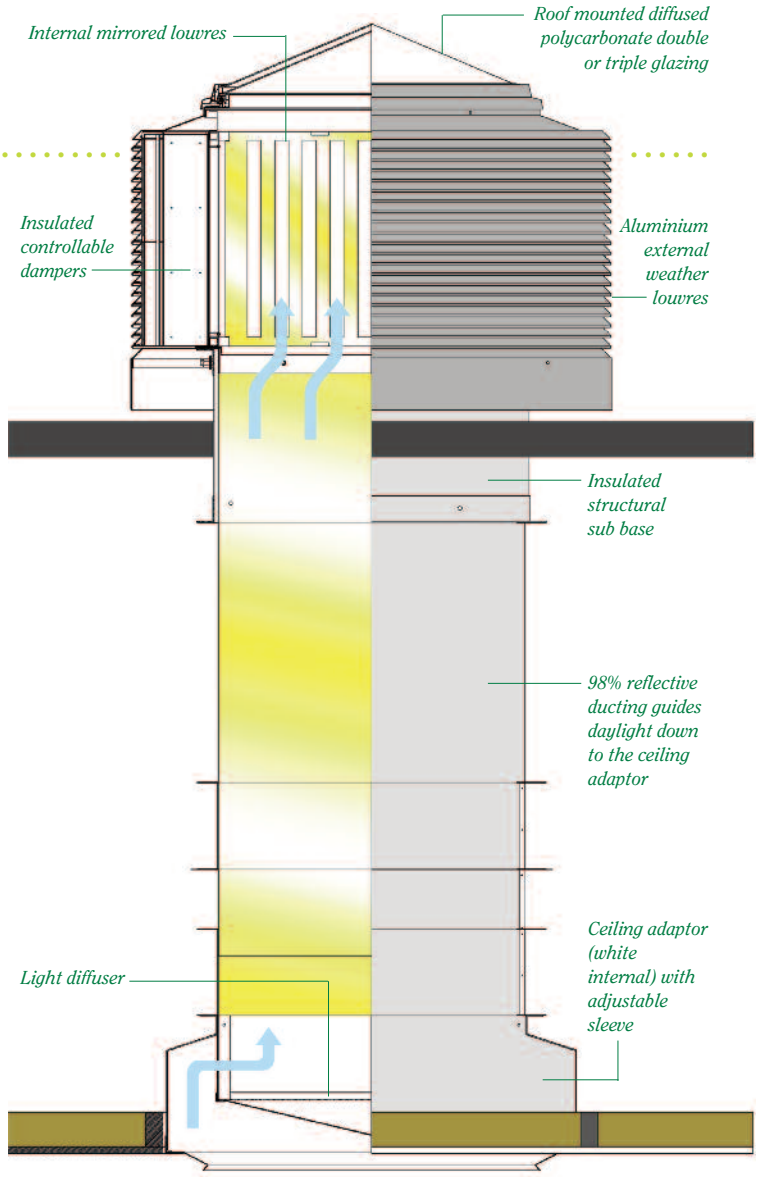
Performance

The ventilation geometric free area of the Sunstract system is 0.5m² and a cd value of 0.34.

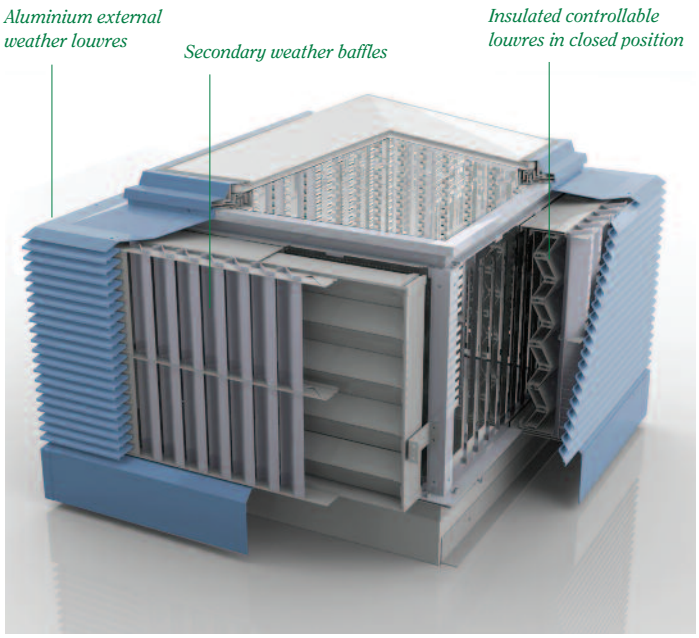
The overall calculated U-value for a Sunstract terminal with double glazed top is 2.06W/m²K and 1.79W/m²K with triple glazing.

Specification clause

Natural daylight and ventilation to … rooms to be provided by means of Passivent Sunstract system comprising:
Roof-mounted unit incorporating triple / double glazed dome / pyramid* of 3.0mm clear uv-stabilised polycarbonate covered by 10-year warranty against loss of impact strength, excessive yellowing and loss of light transmission.
Aluminium double bank weather louvres to achieve 100% rain rejection to BS EN 13030:2001.
Controllable insulated louvres on 4 sides to provide ventilation area of 0.5m²
To have AA fire rating to BS 476: Part 3: 2004.
Duct sections to be 750 / 500 / 250mm to be SR98
Mirror with reflectance 98% and 25-year warranty.
System size: 885mm square
Recessed ceiling diffuser of diffused polycarbonate within ventilated ceiling adaptor incorporating adjustable sleeve.
All exposed ducting within unheated voids to be wrapped with tube insulation. Sunstract terminal will achieve an overall U-value of 2.06W/m²K for double glazed top / 1.79 W/m²K for triple glazed top.*
Supplier: Passivent, North Frith Oasts, Ashes Lane, Hadlow. Kent TN11 9QU
Telephone: 01732 850770, Fax: 01732 850949.
Email: projects@passivent.com
*Delete as applicable



Terminal top cutaway



Looking up the Sunstract shaft with the ceiling diffuser removed.

FURTHER INFORMATION

Services
Passivent has its own in-house research team dedicated to developing techniques and products for natural ventilation, and is a leading partner in some of the most important research projects in this field including NatVent™, a consortium of European organisations headed by BRE.

We offer a comprehensive design and advisory service tailored to your specific project, covering both natural ventilation design and product selection. Advanced Airsoft™ software based on CIBSE AM10 is used to calculate sizes of air inlets and outlets on commercial projects to achieve optimum performance.

Names of approved installers can be provided on request.

Quality assurance
Passivent products are designed, developed and manufactured under a BS EN ISO 9001 quality management system, giving an independently audited assurance that the products will fulfil their intended purpose.

Environment
Passivent conducts all business processes under a BS EN ISO 14001 quality management system, giving an assurance that all activities are carried out having minimal impact upon the environment.

Other products
Passivent sells a range of other ventilation and daylighting products for commercial and domestic buildings including:

Natural ventilation systems.

Aircool® ventilators for windows, curtain walling and walls.

Airstract® roof terminals for passive stack and other natural ventilation systems.

Airscoop® wind-driven ventilation terminals.

Litevent combined ventilator and rooflight.

*i*MEV intelligent mechanical extract ventilation.

Hybrid Plus2 Aircool® ventilators.

Hybrid Plus Airstract ventilators.

SoundScoop® acoustic transfer ventilation products.

PASSIVENT
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