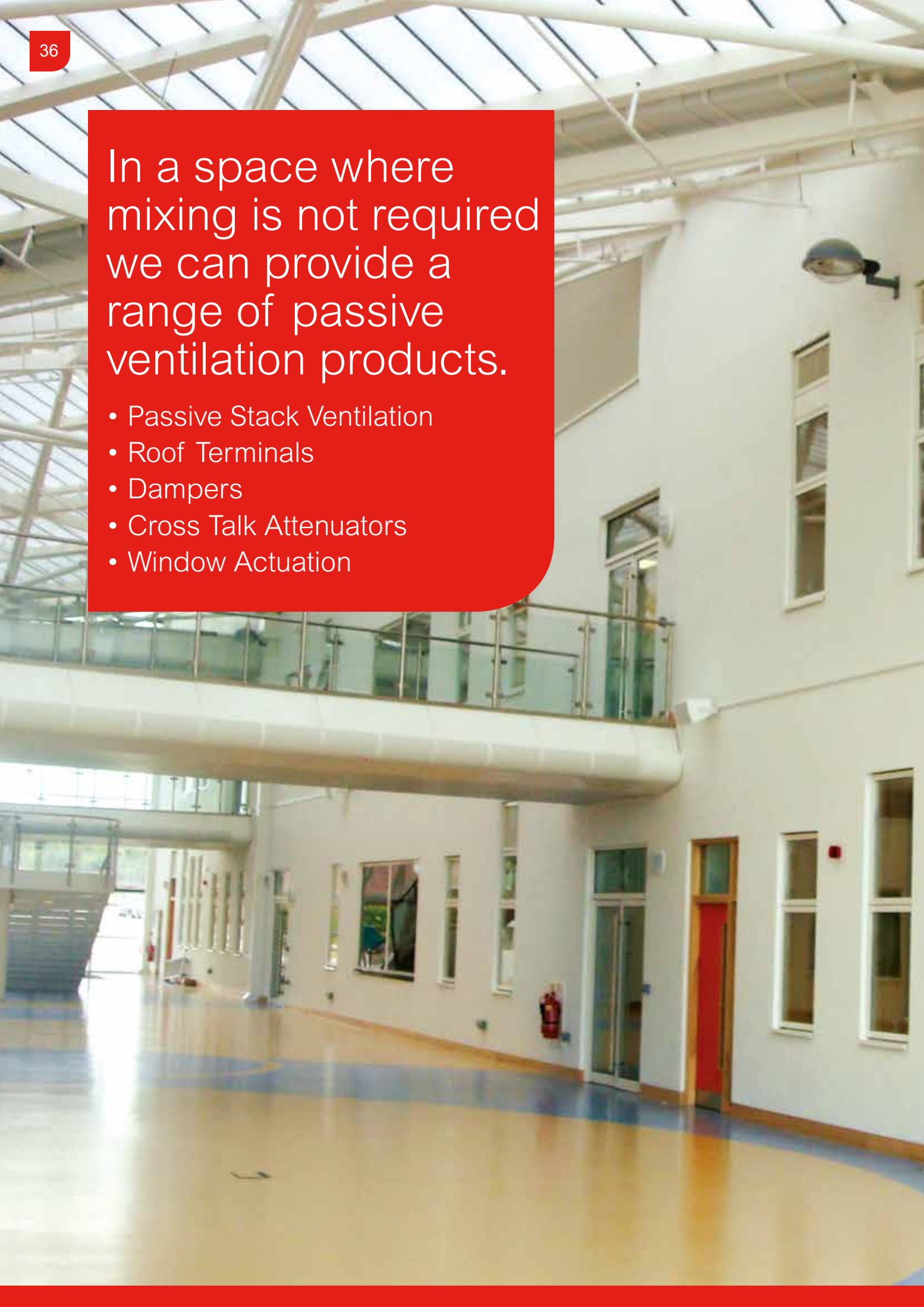


In a space where mixing is not required we can provide a range of passive ventilation products.

- Passive Stack Ventilation
- Roof Terminals
- Dampers
- Cross Talk Attenuators
- Window Actuation

Passive Ventilation

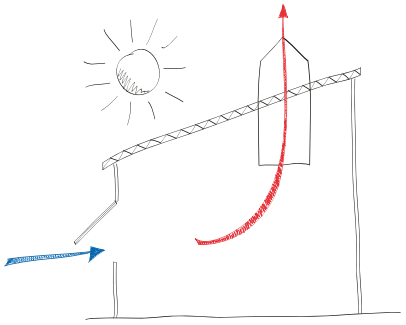
Breathing Buildings offers a full range of passive ventilation products, either as standalone products or incorporated into a Breathing Buildings system

Passive ventilation is an important part of all natural ventilation systems, whether that is providing automated windows in a room, passive acoustic attenuators or high level dampers in an atrium.

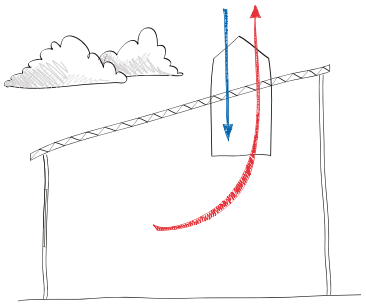
Breathing Buildings has a comprehensive range of products to suit any natural ventilation scheme either as standalone products or for integrating into a broader Breathing Buildings system. Whatever the requirement you can be sure that we have an appropriate product.

Air Flow Strategies

Summer Mode
When it is warm outside the system operates in upflow displacement mode, using the stack effect to achieve high air flow rates and keep the room at a pleasant temperature.



Winter Mode
Without low level openings the unit operates in exchange mode providing inflow and outflow through the damper.

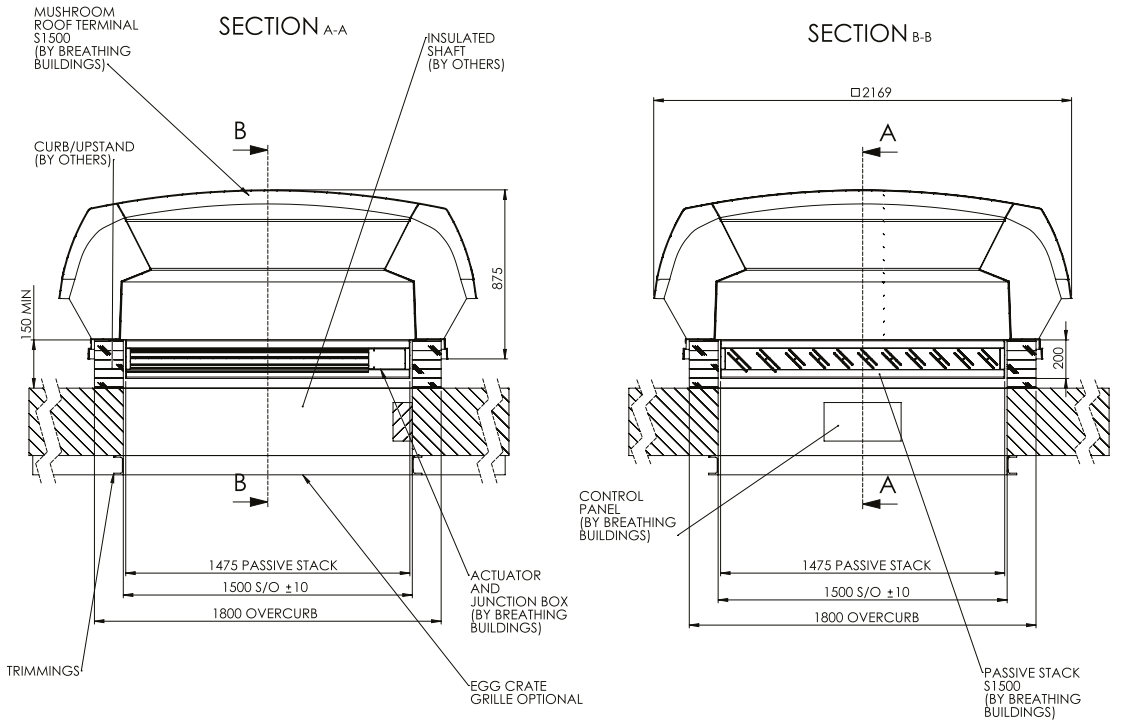


Product Information

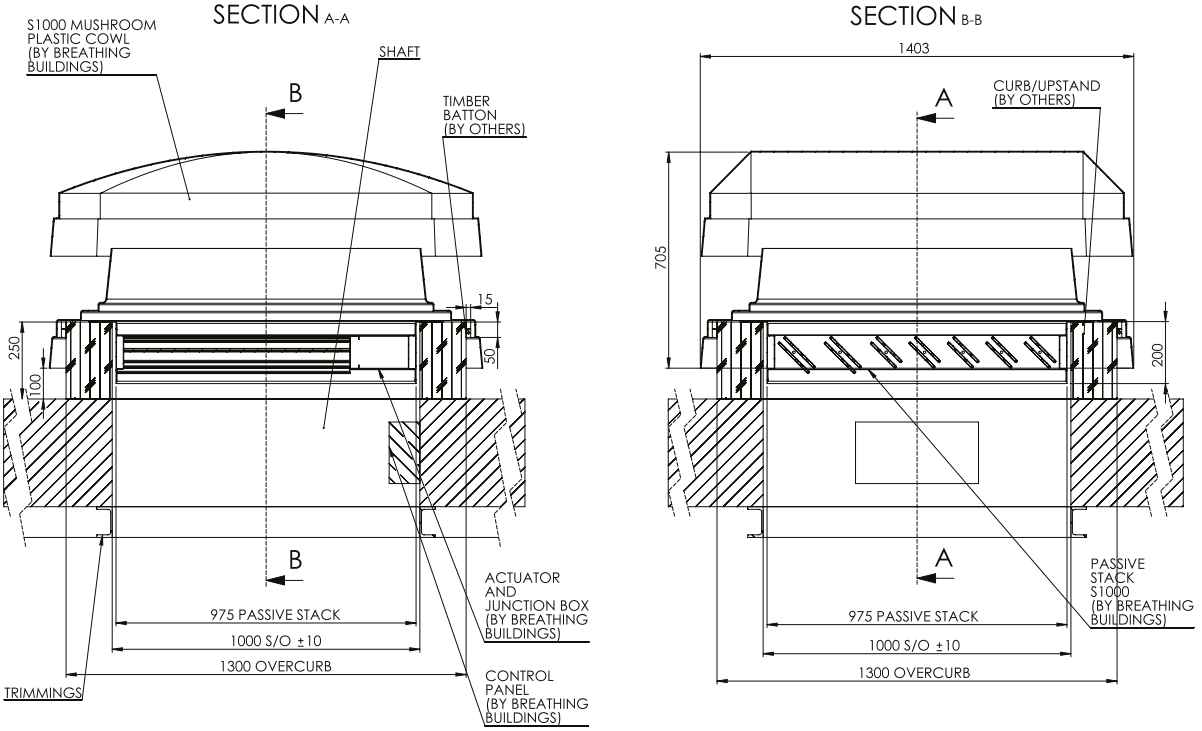
Features
- Upward displacement and wind driven ventilation
- Manual control or Automatic control responding to temperature and CO_2
- Insulated volume control damper ensures appropriate ventilation rates
- Internal temperature sensor with integrated CO_2 sensor
- Install internal unit from roof or from the room

Options
- Range of sizes from 600mm square up to 1500mm square
- Penthouse louvre or mushroom terminal
- Integrated noise attenuation unit offering 25dB for noisy sites, more available on request
- Traffic light indicator panel for window opening
- Control signal for automated actuation of low level windows or dampers
- Modbus link for integration into wider Building Management Systems (BMS)
- Eggcrate grilles

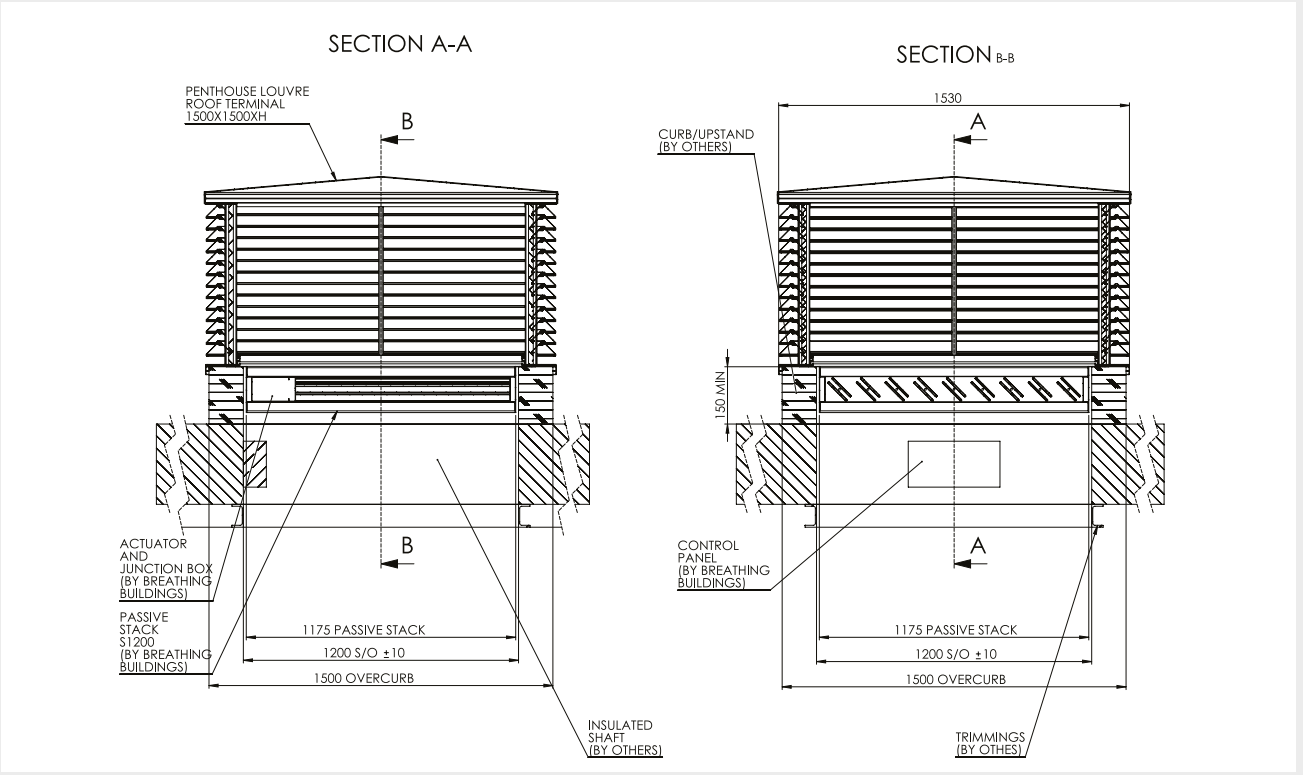
PS1500 Dimensional Drawing



PS1000 Dimensional Drawing



PS1200 Dimensional Drawing



R Series Terminations

Breathing Buildings offer two roof terminations, the penthouse louvre or the mushroom.

The penthouse louvre is most frequently associated with a natural ventilation system. We offer a double bladed system as standard which offers class A weather performance with a triple bladed system for sites where better weather performance is required. The standard terminal comes in RAL 7035 (Light Grey) with corner posts and gabled roof but other options and sizes are available.

The mushroom terminal is an unobtrusive alternative to the traditional bladed metal louvre and has better noise attenuation properties. The terminal is RAL 7035 (Light Grey) as standard but other colours are available on request.

Both terminals offer optional acoustic attenuation.

Installation

A weathered builders curb around the perimeter of the roof penetration and shaft to the E-Stack supports the roof termination which is usually a minimum height of 150mm above the finish roof surface. Once in place the roof terminal is fixed to the curb using suitable fixings. Once installed a bead of mastic or similar is laid around the perimeter of the overcurb.

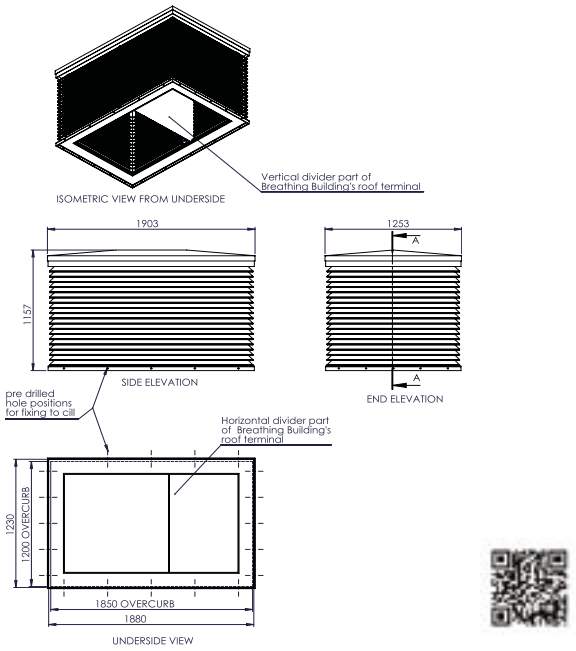
Shaft

An insulated shaft needs to be constructed by others between the bottom of the roof termination and the R series indoor unit. A rubber seal is provided on the top of the E-Stack indoor unit to ensure air tightness with the bottom edge of the shaft. Breathing Buildings has no preference as to the material of the shaft. Previous examples have utilised the concrete soffit, plywood, plasterboard, and ductwork. This is sized to fit the damper (1550mm x 900mm). The terminal height is pre-fitted with a divider.

The shaft is to be divided into two pathways vertically for separation of inflow and outflow. Usually this is constructed from either plywood, plasterboard or galvanised steel etc. and does not require insulation. Note that the split is not equal, with the larger section above the E-Stack fan.

The vertical divider extends from just above the dampers (typ. 25mm above) on top of the E-Stack unit to the underside of the acoustic attenuator or the penthouse louvre roof terminal.

Penthouse Louvre Dimensioned Drawing



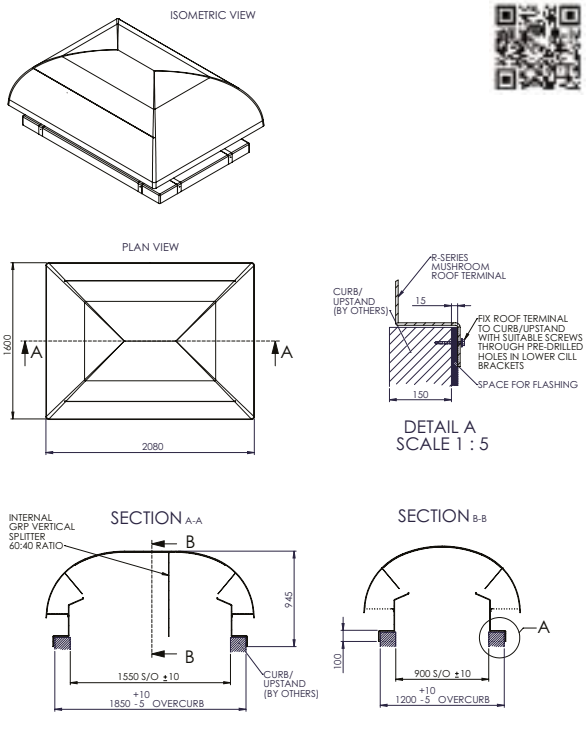
Physical Properties	
Typical weight	180 Kg
Finish standard	RAL 7035
Finish options	Standard RAL
Lifting points	Eyes supplied as standard
Standard attenuation	5 dB
Optional attenuation	25 dB

Shaft Dimensions	
W	1550 mm
D	900 mm

Weather Performance	Double blade	Triple blade
Performance	Class A up to 1 m/s airflow face velocity	Class A up to 2 m/s airflow face velocity

Test involves simulated rainfall of 75l/h at a wind speed of 13m/s (29 mph).
Full BSRIA weather performance test data available on request

Mushroom Terminal



Physical Properties	
Height (Inc. base)	945 mm
Curb dimensions	1850 (l) x 1200 (w) x 150 (h)
Typical weight	150 Kg
Finish standard	RAL 7035
Finish options	Standard RAL
Lifting points	Eyes supplied as standard
Standard attenuation	17 dB
Optional attenuation	21 - 28 dB

Shaft Dimensions	
W	1550 mm
D	900 mm

Weather Performance

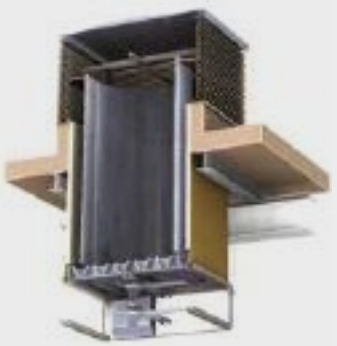
Water testing has been carried out at the BRE using test method *prEN 15601—Hygrothermal performance of buildings—resistance to wind driven rain coverings with discontinuously laid small elements*. The terminal was subject to 75mm/hr/m² at a driving wind speed of 30mph (13.4 m/s). Water ingress during the tests was too small to measure in meaningful terms.

S Series Terminations

S Series terminations fit above both our E-Stack S Series mixing units and the Passive Stack S Series range. The penthouse louvre units are offered in both double and triple blade arrangements and we now have mushroom terminations available across the product range.

Installation

A weathered builders curb around the perimeter of the roof penetration and shaft to the E-Stack supports the roof termination which is usually a minimum height of 150mm above the finish roof surface. Once in place the roof terminal is fixed to the curb using suitable fixings. Once installed a bead of mastic or similar is laid around the perimeter of the overcurb.



Shaft

An insulated shaft needs to be constructed by others between the bottom of the roof termination and the S series. A rubber seal is provided on the top of the e-stack to ensure air tightness with the bottom edge of the shaft wall. Breathing Buildings has no preference as to the material of the shaft. Previous examples have utilised the concrete soffit, marine plywood, plasterboard, and ductwork. This is sized to fit the damper (1500mm x 1500mm).

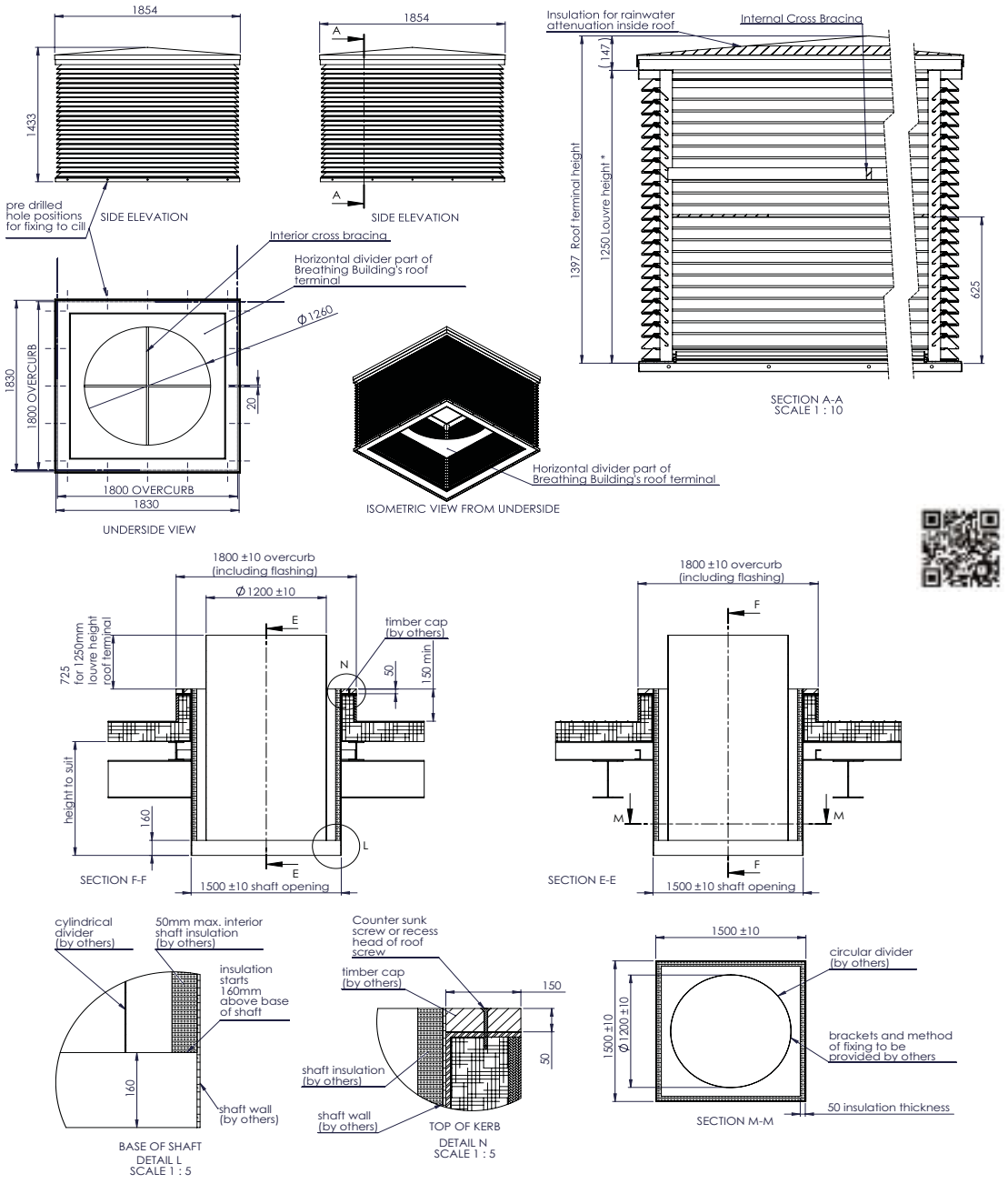
Circular divider (by others)

When a penthouse louvre roof terminal is used a central circular divider (annulus) is mounted by others inside the shaft. This circular divider commences just above the S series (typically 25mm above) and extends up through the shaft to mid-way inside the roof terminal. At this point the circular divider meets with the pre-fitted horizontal divider inside the penthouse louvre. In winter mixing mode the cold fresh air is drawn in through the top of the penthouse louvre and down through the circular divider. Exhaust air leaves the room around the outside of the circular divider and exits the lower half of the penthouse louvre. The cylindrical divider cannot be supported on top of e-stack damper.

L-shaped divider (by others)

When a mushroom termination is used a square duct separates the fresh air from the exhaust within the shaft. The duct is located in the corner of the shaft forming an ‘L’ shape in plan view and is orientated so it matches similar dividers inside the mushroom termination and S series unit. The shaft divider starts at the top of the S series unit (typically 10 mm above) and finishes at curb level (just underneath the roof termination). The divider shaft cannot be supported on top of e-stack damper.

S1500 Penthouse Louvre Dimensioned Drawing



Physical Properties

Typical weight	220 Kg
Finish standard	RAL 7035
Finish options	Standard RAL
Lifting points	Eyes supplied as standard
Standard attenuation	5 dB
Optional attenuation	25 dB

Shaft Dimensions

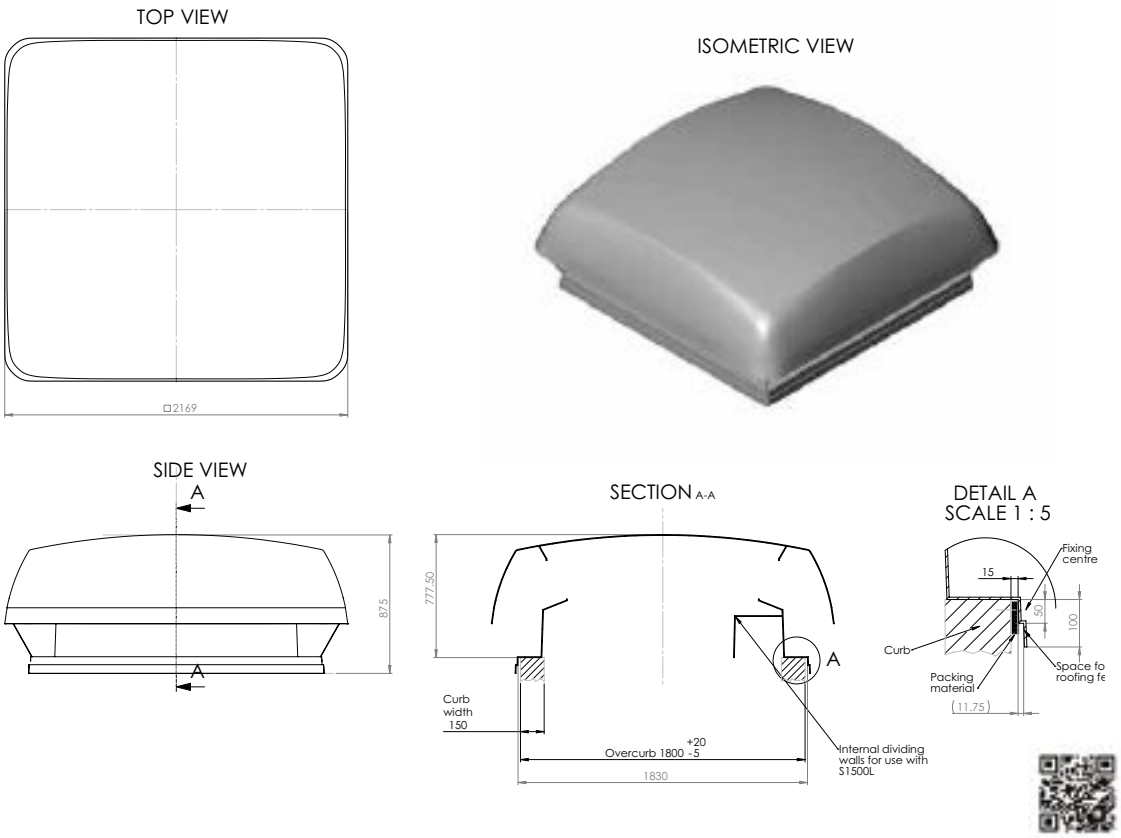
W	1,500 mm
D	1,500 mm

Weather Performance

	Double blade	Triple blade
Performance	Class A up to 1 m/s face velocity	Class A up to 2 m/s face velocity

Test involves simulated rainfall of 75l/h at a wind speed of 13m/s (29 mph).
Full BSRIA weather performance test data available on request

S1500 Mushroom Terminal Dimensioned Drawing



Physical Properties	
Max Height (Dome to sill bottom)	875 mm
Max Length (across dome)	2170 mm
Max Width (across dome)	2170 mm
Height above curb	780 mm
Typical weight	<140 Kg
Finish	RAL 7035 Grey standard. Other RAL colours available
Lifting points	Not fitted

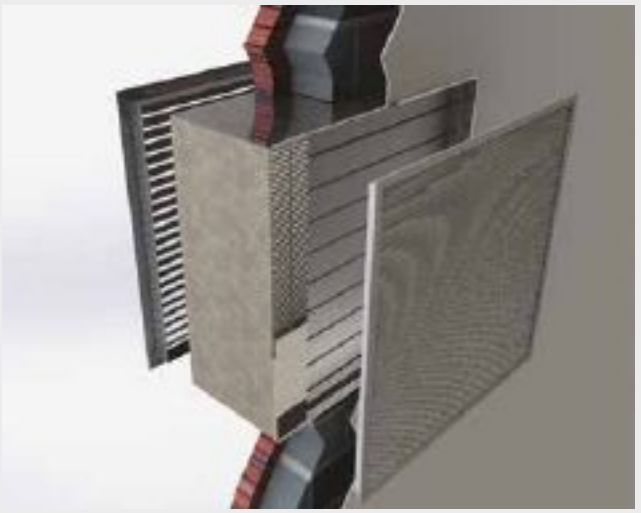
Key Dimensions	
Overcurb	1800 x 1800 mm
Shaft	1500 x 1500 mm
Curb Height	150 mm
Curb Thickness	150 mm

Weather Performance

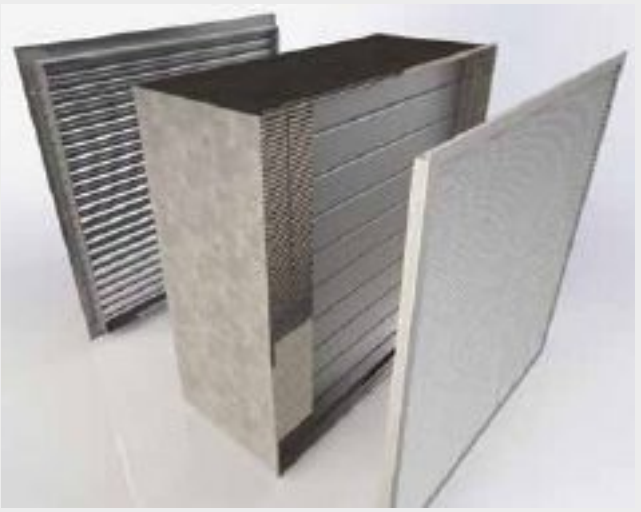
Water testing has been carried out at the BRE using test method *prEN 15601—Hygrothermal performance of buildings—resistance to wind driven rain coverings with discontinuously laid small elements*.
The mushroom profile terminal was subject to 75mm/hr/m^2 at a driving wind speed of 30mph (13.4 m/s). Water ingress during the tests was too small to measure in meaningful terms.

Dampers

Many natural ventilation systems incorporate façade dampers to provide air pathways where it isn't desirable or possible to have windows. We provide a large range of variable control dampers and associated weather louvres. The dampers are insulated and have seals to minimise the air leakage from them when closed. The dampers are supplied with fully variable actuators.



In noisy locations, acoustic linings or acoustic attenuators are provided so that sufficient attenuation is provided. The extent of attenuation depends on the specific site conditions.



The actuators can be controlled using the Breathing Buildings range of ventilation controllers, or if supplied as product-only they can be controlled by the Building Management System.

U-Value	
Part L2a requirement	3.5 (W/m^2 K)
Passive Stack	<0.8 (W/m^2 K)

Damper Air Leakage	
Part L2a requirement	10 m^3/h/m^2
Passive Stack	1.26 m^3/h/m^2
Tested at 50 Pa across whole damper unit	

Passive Stack Ventilation

There are climates and building types when controlled natural mixing ventilation is not required. For example, if a building is located in a zone where the external temperature is consistently above 15°C then it is not necessary to pre-mix the incoming fresh air with room air in order to mitigate cold draughts. Alternatively, if the building is a factory with doors open a lot for loading, then the building may be ventilated adequately in winter through the loading doors and no winter mixing system is required. Finally, if the high level dampers are sufficiently high away from occupants in an occupied room, then it may be possible to achieve sufficient ventilation and natural mixing of the incoming plumes of cold air with the warm room air to prevent cold draughts in winter.

In all of these scenarios the most cost effective means of providing natural ventilation is via a damper in a shaft or a damper in a wall. The high level damper will be used to provide outflow and a cooling effect in warmer weather. In colder weather, the damper can be used to provide both the inflow and outflow if necessary, but in this case it is necessary to ensure that low level openings (such as doors) are closed.

We provide a full range of roof and façade based dampers, penthouse louvres, mushroom terminals, façade louvres and grilles.

U-Value	
Part L2a requirement	3.5 (W/m² K)
Passive Stack	<0.8 (W/m² K)

Damper Air Leakage	
Part L2a requirement	10 m³/h/m²
Passive Stack	2.9 m³/h/m²

Tested at 50 Pa across whole damper unit