



The
RESIDENTIAL
Sola-boost

A solar powered
natural ventilation
system for your home

 Monodraught

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take a breath of fresh air and let your building ventilate

The current drive towards tightly sealed, highly insulated, zero carbon houses can lead to overheating during summer months when occupants are away during the day and windows and doors are shut for security reasons.

The Monodraught Residential Sola-boost provides both fresh air intake as well as a naturally sourced exit path for stale air without using any electrical power. Mechanical ventilation and comfort cooling systems may be used to achieve controlled ventilation and cooling but these are the most “non-environmentally friendly products” in the marketplace today! Other N/V systems may rely on window trickle vents to bring in fresh air and exhaust the air through a mechanical system to atmosphere but the Monodraught system is the only arrangement that provides true, solar powered, energy free operation.



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High levels of Security

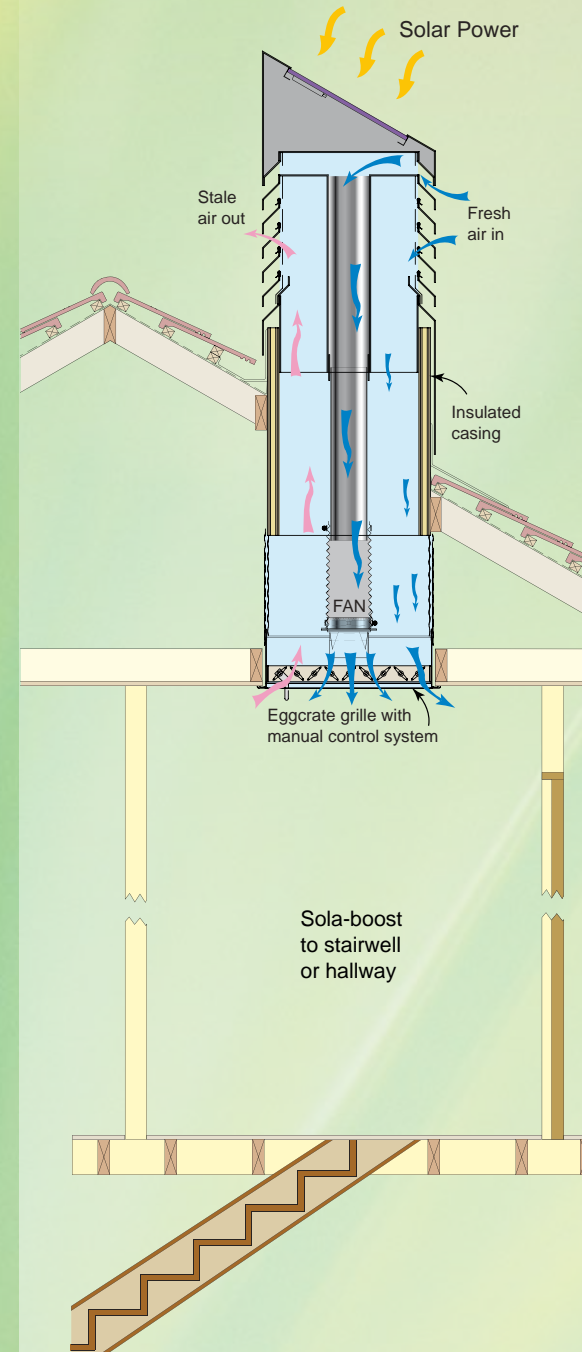
To maintain absolute security 24 hours a day is paramount. Openable windows are a security risk. Nevertheless a ventilation system is essential to deal with:-

- Higher heat gains from the more widespread use of electrical equipment.
- Greater levels of insulation and greater air tightness being provided in new homes and buildings.
- The expectation of ‘global warming’ leading to a warmer climate generally.
- The increasing application of intensive residential developments creating ‘heat islands’.
- A low energy based system that lowers our carbon footprint.

Ideally the Sola-boost system should be positioned above the stairs or landing, since warm air will accumulate centrally at ceiling level and is then vented naturally to atmosphere. Solar power is converted to electricity to drive a high efficiency fan, which carries an airstream into the room down through a central duct. Conversely, the fan can be designed to act as a solar powered driven extract from the space.



Ceiling grille with manual control damper



The Monodraught Residential Sola-boost system addresses this vital problem of the potential of overheating by providing an energy free, natural ventilation system, incorporating a solar driven fan.

..... naturally!

Zero carbon application

The Monodraught Residential Sola-boost system does not use any electrical power whatsoever and exhausts the stale air from within the home by the Passive Stack Ventilation (PSV) method to be replenished by top down ventilation taking fresh air from above roof level, free from contamination, dust or dirt.

The Sola-boost system works in conjunction with the Windcatcher natural ventilation arrangement and with Positive Input Ventilation (PIV). The system combines the well established Monodraught Windcatcher Sola-boost technology together with PIV using no energy whatsoever.

The key to the success of the Monodraught system, is simplicity in its design, installation, and application. The Sola-boost system will suit any roof design with the top solar panel section being removable and adjustable to suit the sun's orientation. With the drive towards zero carbon, energy free housing, the necessity for controlled, energy free natural ventilation has now become increasingly more important than ever before.

Sunshine regulates ventilation

The system works on the basis that the brighter the sun, the greater the ventilation rate. The solar power is optimised to deliver maximum power to the high efficiency fan under full sun conditions.



Patented Design

European and UK Patents have been applied for and the overall design of the system is simplicity in itself. The GRP unit is supplied complete and there are no external fixings and no maintenance required. An eggcrate ceiling grille is incorporated internally with manual dampers but automatic control dampers can be incorporated as an option. Development is currently progressing on an air to air heat recovery unit, which will be available at a later date.

In winter months, the manual damper can either be closed off fully or left slightly open to provide trickle ventilation.

Alternative designs



The Classic Turret



The Chimney Stack



The Clock Tower

Performance

Ventilation Rate

The Residential Sola-boost system is calculated to provide 110l/s of intake and extract ventilation through the combined forces of the Windcatcher top-down ventilation principle and passive stack exhaust. The ventilation rate is based on an external wind speed of between 2 to 3 m/s.

In addition to this natural ventilation rate, the solar powered boost fan using the patented Sola-boost technology, provides an additional 35l/s under summer sun conditions.

The Residential Sola-boost system is to be independently tested by BSRIA in early 2008.

Night Time Cooling

One of the benefits of the Monodraught Windcatcher's unique design is that free night-time cooling can be achieved in summer months simply by leaving the dampers open during the night. This allows the cool night air to flow down from the rooftop and any excess heat build up is naturally vented by the Sola-boost system. In winter time, the dampers can remain closed or left 5% open to give trickle ventilation.

U-Values

The overall performance of the Windcatcher Sola-boost is under assessment but has been calculated to show a U-value of 1.8W/m² K.

Components

GRP Turret

Overall size 500mm x 500mm x 900mm high
Trunk size 400mm x 400mm
Manufactured in 4 ply GRP to any BS or RAL colour on request but supplied as standard in Dark Grey (RAL 7010).

There are no external fixings required and the system is supplied complete with 40mm insulated upstands. A 6mm plastic mesh screen is provided internally and the system is designed to be maintenance free. The weight of each unit is 26kgs.

Solar Panel

The Sola-boost Residential system utilises a 12V, 10W polycrystalline solar panel with an overall dimension of 300mm x 310mm. The solar panel is bonded into the GRP capping of the roof unit system to provide a maintenance free, weather tight finish.

The unit is pre-wired, requiring a simple push fit connection using the one way connector to the control unit within the roof void.

Ultra quiet whisper boost fan

An ultra-quiet, whisper, boost fan carries an airstream into the room below through the central duct of the Sola-boost unit. The fan features a feather edged blade so as to be ultra-quiet.

The fan runs on ball bearings and has a brushless motor for zero maintenance with an expected life of 60,000 hours or 40 years.

Insulated flexible ductwork

An insulated flexible duct is utilised depending on the distance to the First floor ceiling level, which also allows for any slight offset to the ceiling opening. The duct comprises of an aluminium and polyester laminated ducting with an encapsulated high tensile steel wire helix and a 25mm thick rockwall insulation.

The ductwork is fire resistance tested to BS476, PARTS 6, 7, AND 20.

Manual insulated volume control damper

The manual damper has a series of insulated aerofoil blades supplied with neoprene seals to provide a fully airtight arrangement when closed. A micro switch automatically switches the boost fan off when the damper is closed.

Eggcrate Ceiling Grille

An eggcrate grille is used as the termination with the ceiling. This type of grille provides the least amount of resistance to the natural airflow over any other type of grille and has a free area of 90%. The eggcrate ceiling grille is supplied as standard in a white powder coated finish but can also be supplied in mill finish aluminium if required.

The grille is adjusted by two small levers to both sides of the grille.

Insulated Kerb Upstand

To maintain high U-values, a 40mm integral insulated kerb is supplied and the system is fully adjustable to any roof slope.

Patents

Patents applied for:-
UK Patent Application N°0523033.9
European Patent Application N°06255768.1

Guarantee

The Residential Sola-boost system is guaranteed for 10 years.

Optional Items

- 25mm and 50mm Acoustic Foam Linings can be incorporated to reduce noise transfer from road or air traffic.
- Motorised volume control dampers for high ceilings can be used as an alternative to the manual dampers.
- Code level 5 & 6 high performance, double insulated damper assembly with roof membrane sealing plate.
- Winter air to air Heat Recovery system currently being developed.
- Electronic semi-automatic and fully automatic control systems available.
- Alternative turret designs

Further Information

Please contact the Residential Design Department on 01494 897700 or email residential@monodraught.com

Full AutoCAD dwg files and NBS Specifications are also available for inclusion within Architects and Consultants own drawings by request.