

# Ventilation for Schools

[www.breathingbuildings.com](http://www.breathingbuildings.com)

# Why Ventilate?

Creating an inspiring environment with superb air quality and thermal comfort is core to the Breathing Buildings philosophy

The physical environment of a learning facility has a direct impact on the well-being of pupils and staff, and affects the educational outcomes (The Clever Classroom Study, University of Salford). Natural light, thermal comfort, acoustics, good use of space, and excellent air quality all contribute to a favourable learning environment.

Fresh air helps create a stimulating environment for students, and Breathing Buildings has a range of systems to ensure that high air quality can be achieved in all teaching environments.

***“Breathing Buildings have been central to creating the most innovative school building in the UK. The quality of air, and the improvement in the environment in a building with exceptional air and light quality has set new standards for schools. Our students, staff, parents and visitors all comment on the refreshing change from the institutional air they have always experienced in public buildings.”***

- Paul Kelley,  
British Council for School Environment's Innovative  
Educational Professional & Headmaster - Monkseaton  
High School

**Monkseaton High School**  
Whitley Bay, North Tyneside





## Considerations for School Ventilation

### Regulations and standards

#### BB101

The provision of ventilation in a school requires the designer to understand and navigate the interplay of three key factors – air quality, thermal comfort and energy use. These factors need to be considered together. Building Bulletin 101 provides a framework for designers to assess how best to achieve a good building design.

- Provide sufficient fresh air in winter
- Avoid cold draughts in winter and prevent overheating in summer
- Prevent excessive energy bills

#### BB93

In addition, designers need to make sure children can benefit from their educational experience by creating spaces which comply with Building Bulletin 93. BB93 describes the maximum noise levels permitted in the space, and lays out the different noise levels allowed under different modes of operation and for different types of teaching space.

Breathing Buildings provides advice to government on development of the standards for ventilation.

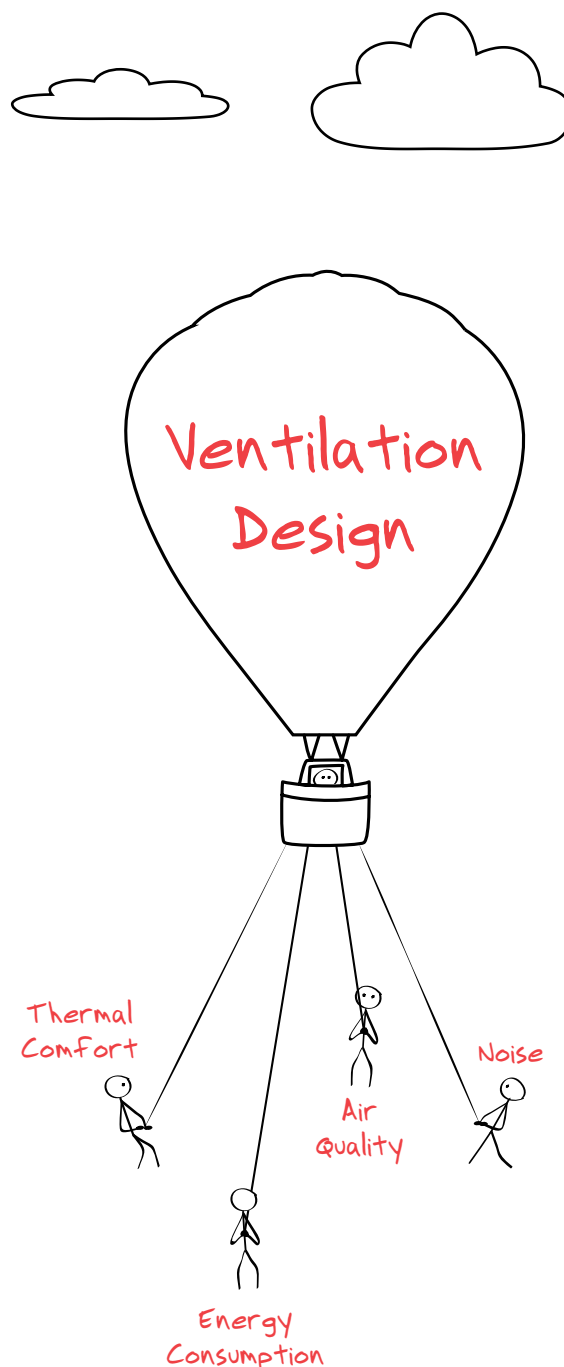
### Reducing noise

Reducing noise is critical to ensuring a good environment for studying. Consideration needs to be given to:

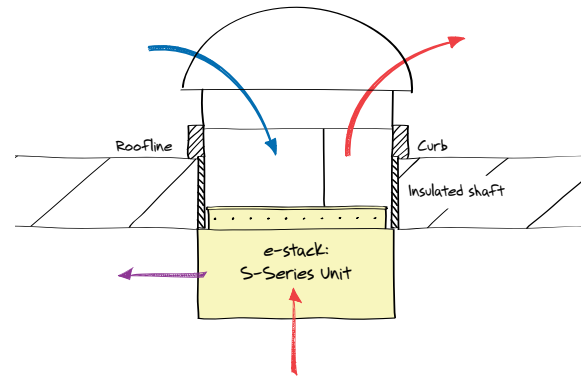
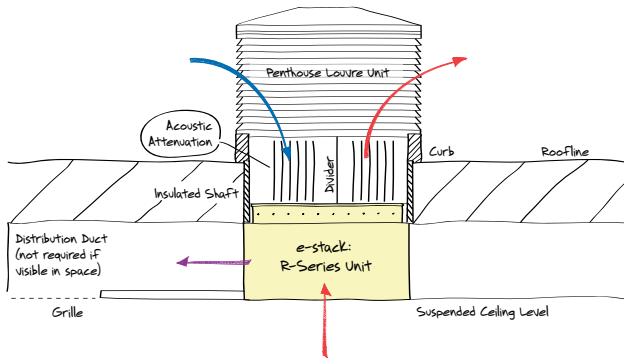
- The ventilation unit itself and associated reverberation within the building
- On particularly noisy sites, where break-in noise becomes an issue, or when preventing cross-talk between spaces, acoustic attenuation may be needed to prevent noise ingress into the building or between rooms

### Challenges when designing ventilation

Ventilation design must balance the competing tensions of air quality and thermal comfort, whilst staying within the acoustic limits and energy efficiency standards.

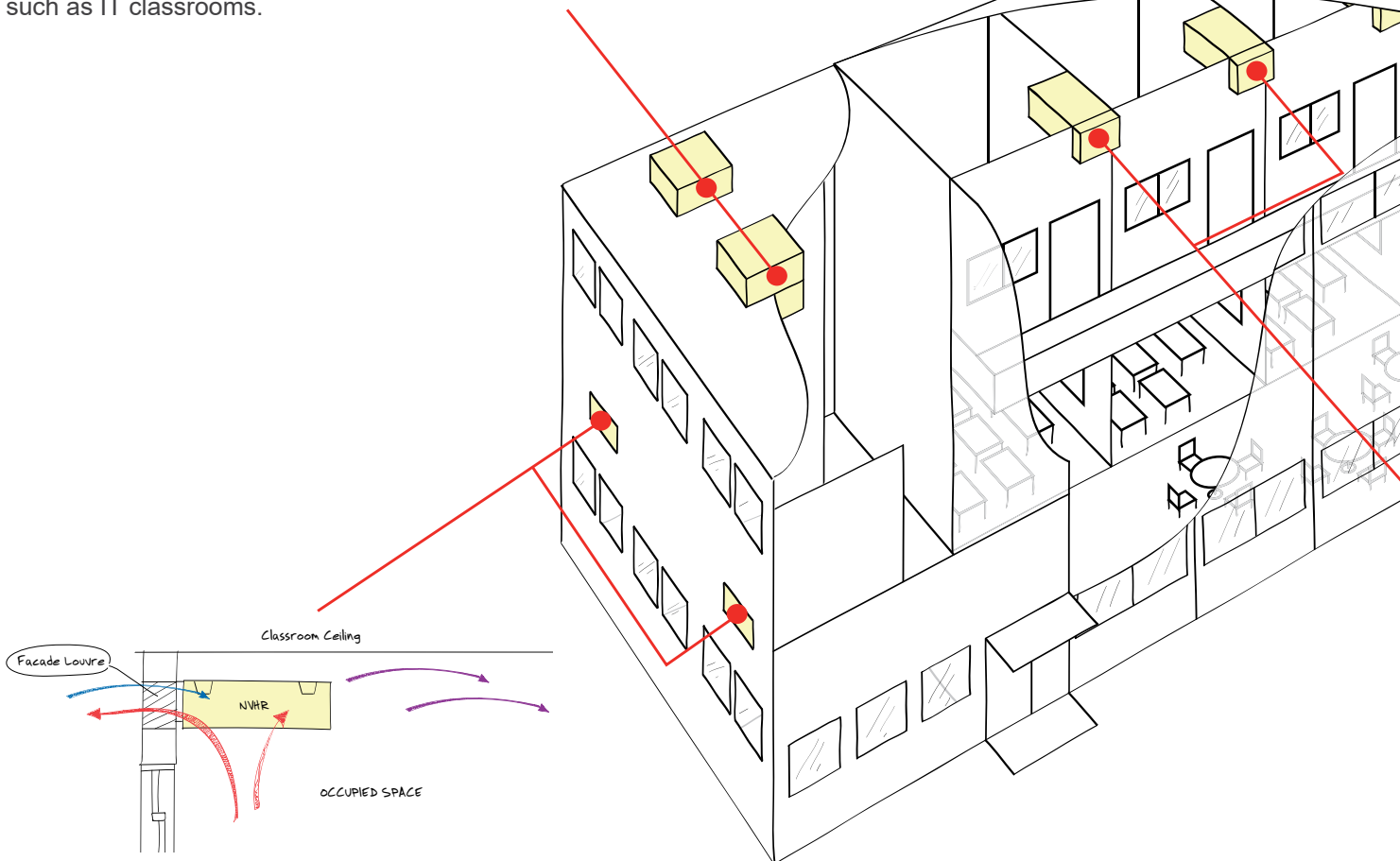


# What We Offer



## R-Series

For classrooms at the top of multi-storey schools or areas that generate excessive amounts of heat such as IT classrooms.

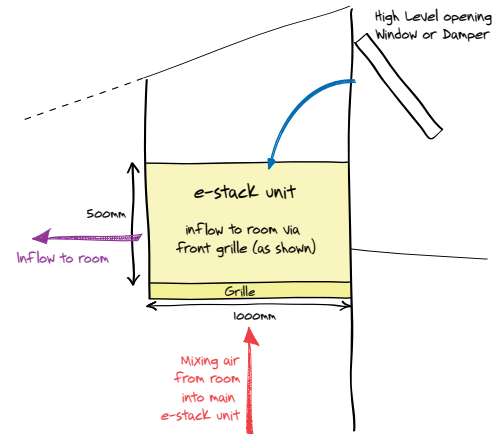
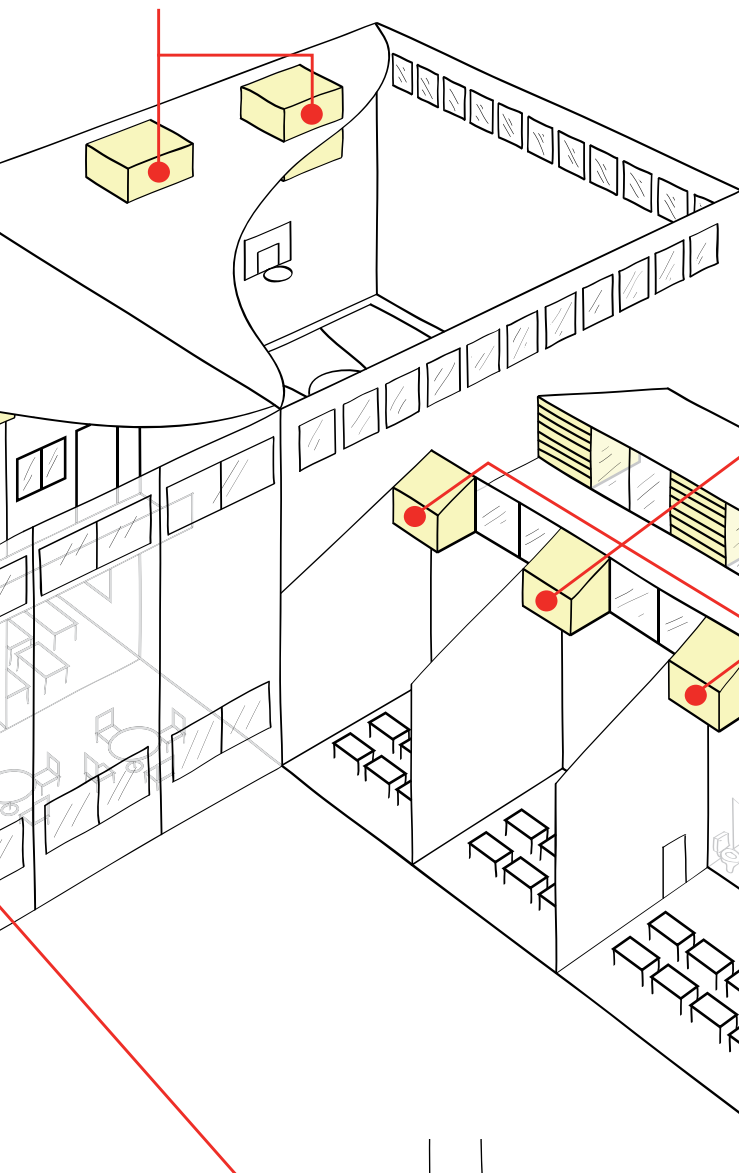


## NVHR®

For classrooms which have an external façade but no roof access or link with an atrium, the most appropriate solution is the NVHR®.

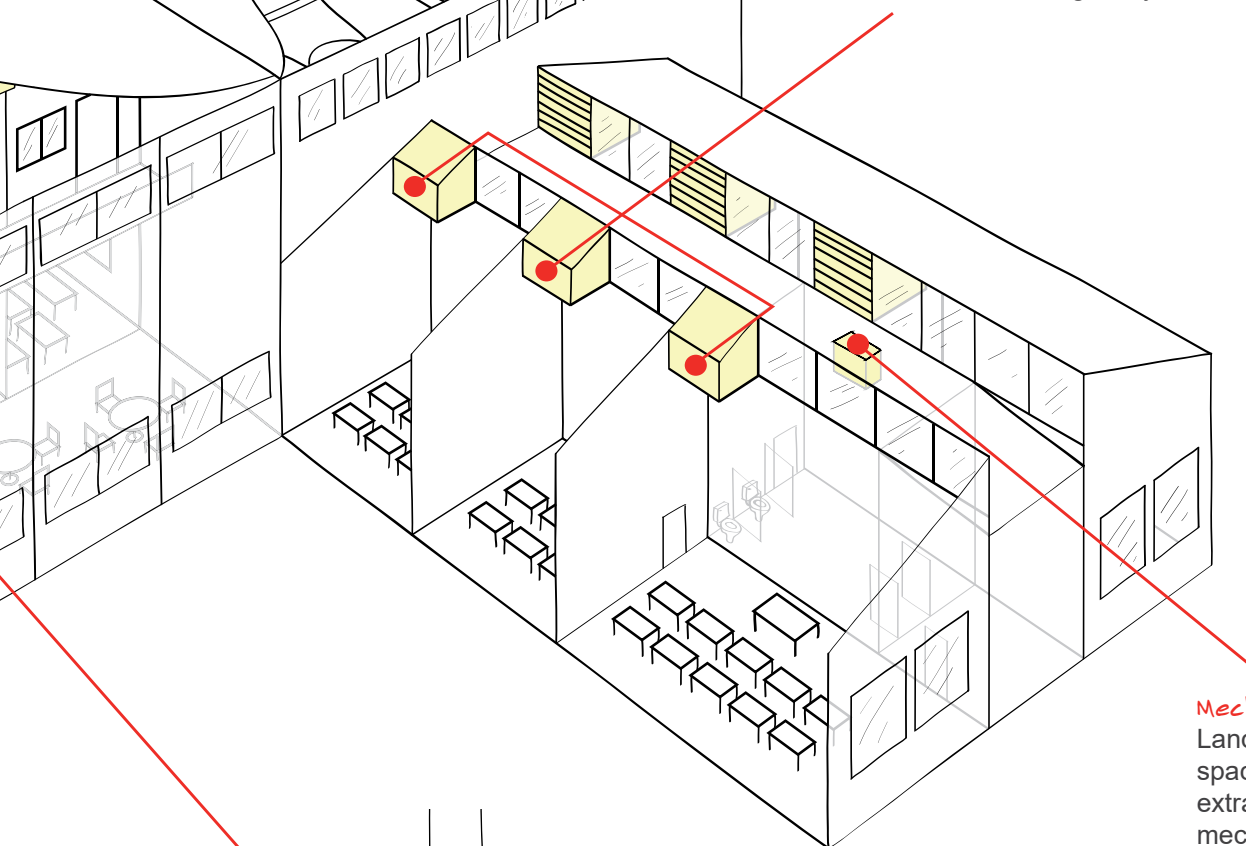
### S-Series

In larger spaces such as school halls, our S-1500 units ensure excellent ventilation and low energy consumption while also complying with BB101 summertime overheating requirements.



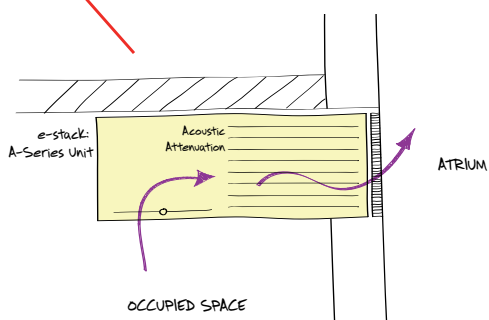
### F-Series

Our F-Series unit is ideal for classrooms with sloping roofs or which have a bank of clerestory windows facing away from an external wall.



### Mechanical Ventilation

Landlocked rooms or spaces requiring fixed extract rates will be mechanically ventilated as appropriate.



### A-Series

In an atrium with classrooms linked to it our A-Series units provide low cost mixing ventilation in winter, and compliance with BB101 summertime overheating.

# What We Do For Our Clients

Monitoring studies show that Breathing Buildings' systems can help to reduce heating bills by a factor of 3 compared with CIBSE standard practice

## Our Mission is Simple

We aim to help clients create the lowest energy building possible with minimum associated CO<sub>2</sub> emissions and capital cost, whilst providing good indoor air quality and thermal comfort at all times

- Unrivalled design services and modelling expertise
- Tried and tested, reliable products
- Dedicated project management service for every scheme

## Unique Design Service

- Expert consultation on natural and hybrid ventilation
- Dynamic thermal modelling
- Computational fluid dynamics
- Water bath modelling
- Design responsibility with full PI cover

## Product Solutions

- Natural ventilation systems
- Hybrid ventilation solutions
- Fully automatic or manual control
- Integration with BMS, heating and air-conditioning

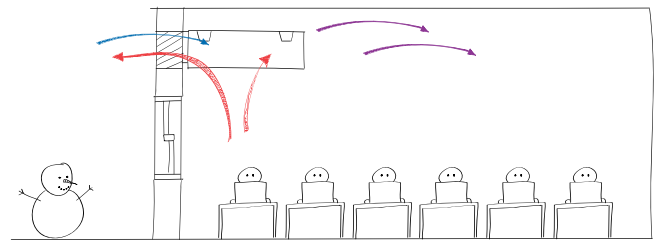
## Installation Support

- Commissioning and user training
- Service, maintenance, software upgrades and extended warranty
- Monitoring

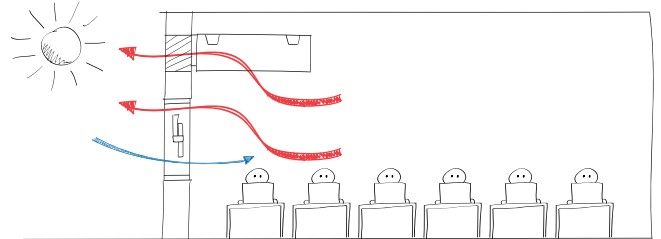
## Air Flow Strategies

Breathing Buildings NVHR® units provide façade-based mixing ventilation, offering enhanced natural ventilation in a slimline, compact unit. The below graphics demonstrate the different air flow strategies.

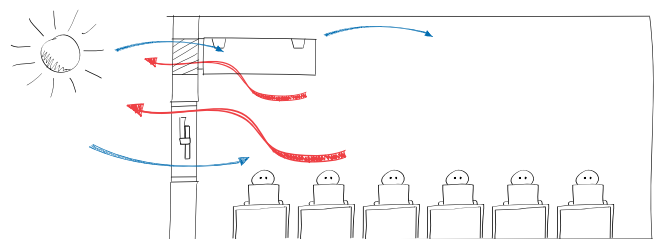
### Winter Mixing



### Natural Mode



### Summer Boost



## Seeing is Believing

We have projects all over the country so let us take you to one near you:

**Samuel Lister Academy Yorks PSBP** is one of the first UK schools to make use of the NVHR®+ enhanced natural ventilation system. The NVHR®+ heater pod variant incorporates a 'Low Temperature Hot Water' heating coil, and is an example of Breathing Buildings' continued product development. The BB team worked closely with the architect and main contractor to develop a precisely-tailored solution for the needs of this development.



**YMCA East Anton** is a purpose-built nursery for 0-5 year olds which opened in October 2017. At early design stage it was suggested that the classrooms should have mechanical ventilation systems. However, YMCA had concerns about the energy use as well as maintenance costs associated with a mechanical ventilation scheme. Breathing Buildings were approached by Darcy Construction to design a natural ventilation system that would be unobtrusive and provide high levels of ventilation to keep the rooms fresh.



**St Raphael's Primary School** in London features a low-energy ventilation solution designed by Breathing Buildings for a new teaching block. The building, completed in January 2015, includes a double-height dance/activity hall (ventilated with e-stack S1500 units), three ground floor classrooms (ventilated with NVHR® units) and three first floor classrooms (ventilated with e-stack R-Series units).



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