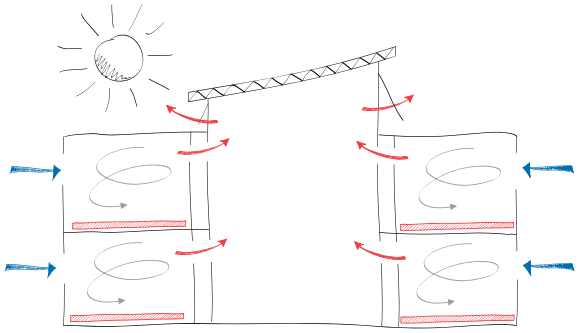
Breathing Buildings

e-stack: A-Series

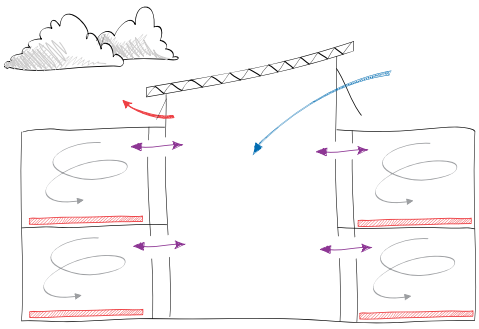
Ventilation System for Buildings with Atria

Atria are often designed into buildings to provide a light and airy environment which is adaptable for the needs of the occupants. By providing a flow path through the building, they can also aid the adoption of a natural ventilation strategy for the surrounding rooms.



Summer Strategy

Upwards Displacement Ventilation



Winter Strategy

Winter Mixing Ventilation

Breathing Buildings have developed an innovative low energy approach to the ventilation of buildings where rooms are connected to a central atrium. The system can be deployed in single as well as multi-storey buildings.

In summer the building is ventilated using upflow displacement ventilation. Air enters through exterior windows in each space before flowing into the atrium through e-stack A-Series units. The air rises within the atrium and exits through the openings at the top of the space. The difference in height between the low level entry of fresh air and the exit of warm air through the atrium creates a natural buoyancy effect which draws air through the building.

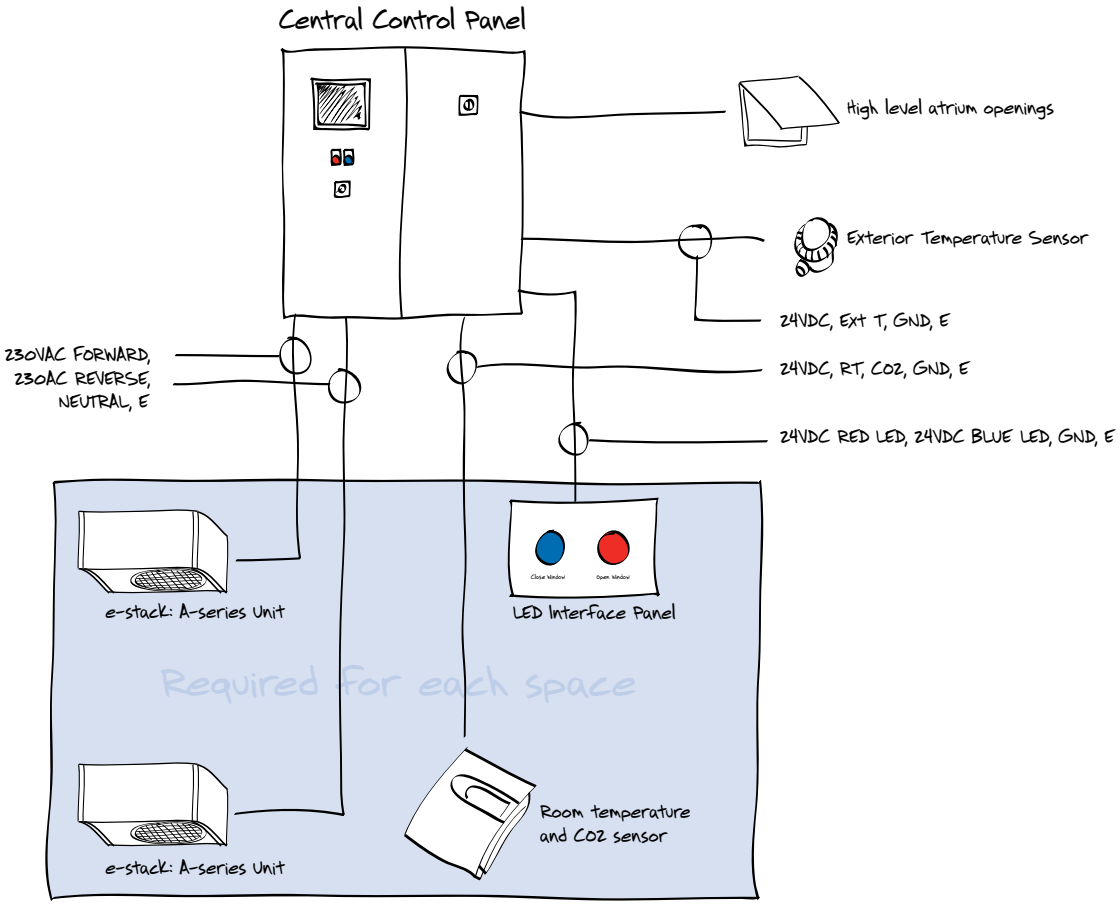
In winter, incoming air has to be warmed before it enters the occupied space. Instead of bringing air in at low level and pre-heating, a different strategy is used which can lead to significant energy savings. The low level openings in the side rooms are closed and the building is ventilated using the openings at the top of the atrium. Ventilation of the side rooms is then achieved by mechanically exchanging air with the atrium using the e-stack A-Series units. Two units are incorporated into each space, one to supply air to the room and the other to exhaust it. By exchanging air between the side rooms and the atrium in winter, the atrium recycles the heat within the building.

The ventilation system is fully controlled from a central control panel with dedicated temperature and CO_2 sensors for each space. This allows the system to optimise the ventilation strategy for comfort and energy use. The panel also controls the high level openings in the atrium and provides a signal to the LED interface panel in each space to indicate when the windows should be opened.

e-stack: A-Series
Mechanical and Electrical Specification

Dimensions:	A-500: 1810mm (L) x 1338mm (W) x 500mm (H) A-800: 1810mm (L) x 1008mm (W) x 800mm (H)
Positioning in the space:	A room set comprises two A-Series units. These may be positioned in a bulkhead, suspended ceiling or left visible within the space
Nominal Weight:	A-500: 200kg A-800: 220kg
Construction:	Galvanised steel or Zintec
Recommended fixing methods:	Via drop rods and cradle arrangement (by others) or brackets (at additional cost)
Colour:	Standard galvanised finish or Zintec powder coated to RAL9010 as standard (other RAL and BS colours available at additional cost)
Controller:	A Central Control Panel mounted remotely from the units is typically used to control all A-Series units connected to a single atrium. Central Control Panel also provides a control signal to actuated high level openings.
Sensors:	Combined interior temperature / CO_2 sensor, per space. External temperature sensor
User interface:	Red / blue "Open/Close Windows" indicator panel (for low level manually opening windows)
Acoustic Performance:	The A-Series units have been acoustically tested in accordance with BS EN 20140-10:1992 and ISO 140-10:1991 and are shown to meet the requirements of BB93 – Acoustic Design of Schools

Typical Control System Layout



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