



Eaton-Williams reduces cooling costs for new language labs at Scottish university

Case Study



Air distribution from Eaton-Williams® helps deliver energy savings at Heriot-Watt university's landmark language and interpreting facilities.

Heralded as the finest in Europe, the four new labs and one self-study lab are modelled on those used in the European Parliament. They provide students with hands-on interaction with translation and interpreting equipment and also include facilities for the first British Sign Language (BSL) interpreting degree in Scotland.

In addition to COLMAN® air terminal units, Eaton-Williams supplied REPUS® displacement ventilation systems to maximise the opportunities for using fresh-air in the laboratories to provide free cooling for a large proportion of the year.

Free cooling is provided for a large proportion of the year.

With increasing demands for greater energy savings in buildings and the tightening of buildings regulations, the combination of displacement ventilations systems and standard air distribution systems offered the most energy efficient solution.

Relying on natural buoyancy (thermal convection) of warm air to deliver improved ventilation and comfort, displacement ventilation delivers fresh, filtered air at low velocity and low levels at a temperature lower than the desired room temperature. The cooler supply air then displaces the warmer room air, creating a zone of cool fresh air at the occupied level.



Heriot-Watt required a fast track approach and high specifications. Two types of air distribution systems were used in the translating booths. A circular connection was selected because of space limitations and to prevent air being blown across users' faces and to facilitate the use of larger plenums, particularly in larger booths.

The diffusers are mounted in each teaching booth. As space is limited the students are very close to the terminals

in a confined space, resulting in very short 'near zones' being requested. The circular diffusers have surface mounted fronts which incorporate the wall, so these were customised using the COLMAN online calculator. Square perforations were requested by the university with additional perforations to the border of the diffusers, because of the extremely short 'near zones' in the booths.

REPUS rectangular panels were also used as these are designed for mounting in any building where recesses or stud walls form part of the construction or where columns are boxed in. They provide a displacement ventilation system with improved air quality and lower temperatures in the occupied zone than with traditional air distribution systems. Their internal nozzles deliver a radial distribution of air over the entire face area without risk of draughts. The panels use no foam or filters there are no risks of clogging and are maintenance free.

Case Study: Eaton-Williams reduces cooling costs for new language labs at Scottish university



Eaton-Williams® COLMAN® range of ceiling grilles were also extensively used. The 'D' Series of fixed circular swirl diffusers which offer a high level of induction due to the angle of the blades and provide warm or cooled air to the required space are used for extracting air in the language labs. The 'G' Series of return air grilles were selected for both wall and ceiling applications.

Benefits

- Economical to run
- Operational efficiency
- Can be concealed with architecturally designed fascia
- Quiet operation
- Greater compatibility with architectural / building requirements
- Improved air quality in occupied space
- Opportunities for customised designs to suit aesthetic requirements
- Draught free

Displacement ventilation offers a flexible, environmentally friendly solution for indoor-air-quality and comfort issues

Applications

Displacement ventilation systems are ideal for a variety of premises and environments with high ventilation requirements. These are typically where contaminants are warmer and/or lighter than the surrounding air, where the supply air is cooler than the ambient air and where the room heights are more than three metres.

As well as industrial environments, applications include classrooms, airports, atria, retail, food service areas, concert halls and lecture theatres; systems are also used in offices. In many cases the reduced air-volume requirements of displacement systems means that the costs compare very favourably with a mixing system.



The Building Research Establishment (BRE) has carried out research to determine if displacement ventilation is an effective method for producing low-cost energy-efficient cooling.

Results show that displacement ventilation on its own using appropriate diffusers can manage with heat loads of around 60 W/m² to 80 W/m² in typical office environments without causing thermal discomfort outside the 'near zone' area. This enables a reduction in energy by using fresh-air free cooling for much of the year.

