



## **TROX AIR MANAGEMENT SYSTEMS BEST IN CLASS FOR UNIVERSITY OF BIRMINGHAM LABORATORY PROJECT**

TROX EASYLAB air management systems, VAV units, and fume cupboard controllers have been chosen to optimise energy efficiency at the new BREEAM 'Excellent'-rated Collaborative Teaching Laboratory (CTL) at the University of Birmingham.

Completed in August 2018, the new-build facility represents an investment of over £40m in the field of Science, Technology, Engineering and Mathematics (STEM). The new CTL building has a striking design, using large amounts of glass to reflect the spirit of collaboration and community engagement driving the project, and featuring a large angled brise-soleil made from gold anodised aluminium which projects over the main entrance. The three-storey 72,120 sq ft building is constructed in a variety of materials and forms, to represent three different internal environments of the laboratories (the dry lab, the wet lab and the e-lab). 'Collaboration' holds a double meaning for this project. In addition to promoting interdisciplinary engagement across the different departments of the university, the new building is designed, internally, to lower the amount of redundancy present when running multiple single-disciplinary labs. The aim is to create spaces that are utilised for a greater percentage of the time, with the ambition of achieving occupation rates of up to 70%.

For the parties involved in the design and installation of the building services, including consulting engineer Couch Perry Wilkes and M&E contractor Imtech, the energy efficiency of the research spaces was a major priority. The energy consumption of laboratories is often three to four times that of offices on a square metre basis, due to higher cooling loads and the requirement for larger volumes of conditioned air for equipment such as fume cupboards.<sup>1</sup>

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<sup>1</sup> Peter James and Lisa Hopkinson, 'Carbon, Energy and Environmental Issues Affecting Laboratories in Higher Education - A Supplement to the HEEPI Report on General Regulations and Schemes on the Topic', August 2011.

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This can mean that laboratory buildings are responsible for between 50% and 80% of the total energy-related (non-residential) carbon emissions of research-intensive universities. To meet the demanding criteria for the new CTL, laboratory air management specialist TROX was approached to provide best-in-class solutions capable of optimising energy efficiency whilst maintaining the appropriate safety and comfort conditions for building occupants.

The new facility houses nine purpose-designed laboratory spaces ranging in size, scope and purpose. To maximise environmental performance of these areas TROX installed EASYLAB room air management systems incorporating 88 TROX VAV (Variable Air Volume) units. The TROX EASYLAB systems manage the supply and extract controllers to provide a rapid response to changes in extract volumes by the technical extract (for example fume cupboards) to ensure the correct air flow balance and room pressure at all times in the laboratories. This significantly improves energy efficiency, as it prevents unnecessary supply of conditioned air to the space.

TROX also supplied equipment capable of optimising the lifecycle costs of the University's extensive investment in scientific hardware. For example, one large space in the CTL includes no less than 50 fume cupboards. To optimise energy efficiency of these pieces of equipment, TROX's air management system divides the lab into 5 zones, each with 10 fume cupboards fitted with TROX EASYLAB TVLK-type fume cupboard controllers. Sash distance sensors control the volume flow rates based on the height of the sashes, and TROX BE-SEG-02 user displays, with traffic light warning systems and audible alarms, contribute to safe working procedures. Each zone features two supply air VAV units which track the extract air, ensuring the maintenance of correct leakage flows. By matching the supply of air to the changing requirements of the space these features reduce over-supply and wastage of conditioned air, ensuring that research can be carried out safely in the space whilst achieving the optimum level of environmental and financial performance.

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The open bench area features eight dedicated EASYLAB VAV units, switched locally, to provide LEV extract with local fault and alarm indication. All the units in the project feature a BACnet MS/TP interface card, allowing the University Estates team to monitor the specialist lab air management systems via the site's BMS. The levels of efficiency made possible by the TROX air management systems have contributed to the outstanding levels of environmental performance of the new building as a whole. The building boasts an 'A' EPC rating and has been rated 'Excellent' by BREEAM.

Ian Thomas, Product Technical Manager – Air Products at TROX UK, commented, "It's a pleasure to be involved in a forward-thinking project such as the Collaborative Teaching Laboratory facility at the University of Birmingham. The logistics of the project offer considerable efficiency improvements over running multiple single-disciplinary labs, and we are extremely proud to have been able to support that vision with our equipment."

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