



## Colt in Education

### *Environmental Solutions for Educational Buildings*



Climate Control, Smoke Control & Solar Shading

# NATURAL VENTILATION

Colt specialises in providing tailored natural ventilation solutions for all types of educational buildings.



Colt systems are designed in accordance with BB 101.

With sustainability and energy efficiency in mind, many educational buildings are designed to be naturally ventilated. Natural ventilation harnesses the freely available elements of wind and heat to move air through a building. Natural ventilation can be effective whilst offering reduced capital, space and running costs compared to conventional air conditioning.

Colt's natural ventilation systems concentrate on automatically opening and closing windows, ventilators and rooflights in a controlled manner. The systems can range from a simple open / close switch to a fully integrated energy management system, which could include carbon dioxide measuring, internal and external temperature measuring, external weather sensors as well as interfaces with building management systems.

Whether the requirements are for day-to-day ventilation or a combination of day-to-day ventilation with smoke control, or a hybrid system of mechanical and natural ventilation, Colt can provide the solution.

Colt is able to offer a total solution to its clients from assistance at concept stage through to the installation of the system and beyond to service and maintenance.



*Coltlite is a natural glazed ventilator for installation into the facade which can provide both day to day and smoke ventilation. Its form and function make it particularly suited to educational buildings where good U values and low air leakage are required.*



*Colt Turret units are available in a wide range of standard sizes in Single bank or Double bank configurations. Colt Turrets are available in a complete range of finishes and materials from standard mill finish and polyester powder paint finish to anodised and stainless steel.*

# SMOKE CONTROL

Smoke prevents people from escaping and makes it difficult for the fire brigade to see where the source of the fire is. Colt's smoke control systems ensure that if there is a fire, smoke is contained and removed, allowing safe evacuation and fire-fighting.



Farnborough 6th Form College - Natural ventilation, WRF Caloris, External Solar Shading and smoke control ventilation system controlled by Colt's ICS4-Link control system.

Building Bulletin 100, Design for Fire Safety in Schools, applies to nursery schools, primary and secondary schools, academies and city technology colleges, special schools and pupil referral units. It is the normal means of compliance with Building Regulations for fire safety design in new school buildings and sets out the DCSF policy on fires within schools.

With Smoke Control Ventilation, the detailed design guidance mainly relies on containment by walls and doors to prevent smoke from entering escape routes. Automatic smoke control systems

(triggered by an automatic detection system) can achieve the same ends, by extracting smoke from the building. This provides benefits for means of escape and also facilitates access by the Fire and Rescue Service. It is important to note that most natural ventilation solutions can be utilised for dual purpose smoke control with little design change.

Colt can provide a premium design service from initial bid through to final negotiation. When it comes to educational buildings, Colt's unique breadth of expertise and product range

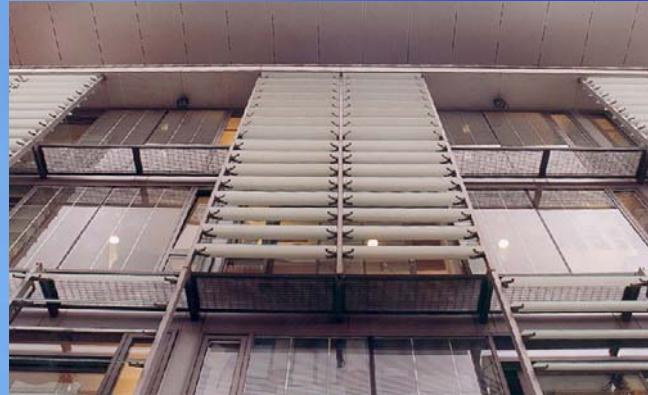
spans across the specialities of smoke control, climate control, solar shading and glazing systems. We design, manufacture, install and commission each system, and importantly, make them work in harmony with each other.

# SOLAR SHADING

Controlled natural daylight is critical for any educational facility. Colt solar shading systems offer designers the opportunity for distinctive architectural impact, whilst reducing solar glare and solar heat gains.

The need to provide extensive cooling in summer and insulation in winter inevitably arise with today's modern buildings.

Colt design a wide variety of fixed and movable solar shading systems that optimise the flows of heat and light energy. This in turn may have a positive effect in reducing the heat load and glare, into the learning spaces enhancing the use of natural daylight. This helps enhance internal working conditions for both staff and students.



St Aloysius' School, Glasgow

The new Junior School for St Aloysius' was designed by Glasgow based architects Elder and Cannon and incorporates Colts Shadoglass Solar Shading System



University Library, Portsmouth

A new three-storey extension has been built, designed by architects Penoyre & Prasad and includes a bespoke solar shading system and hidden natural ventilators



Tanaka Business School, London

When the Imperial College in London asked Foster and Partners to redesign the "black tower" portion of their flagship Tanaka Business School building on Exhibition Road in London, Colt were consulted with regard to the design of a glass louvered veil to conceal the existing concrete structure, whilst allowing daylight penetration to the fenestration behind.



# HEATING & COOLING

Designing natural ventilation solutions is of paramount importance when it comes to education building design. But what energy efficient option could you consider for heating (or even boost cooling for those occasional hot summer days)?

The award winning Caloris WRF (water and refrigerant flow) water source heat pump system can be installed in the classrooms with de-centralised local control to provide both heating during the winter and boost cooling in the summer where the heat loads are expected to become too high for natural ventilation. WRF offer customers a more efficient and effective option than traditional VRF and fan coil systems that provide both performance and environmental benefits.

The Colt WRF system is based on reverse cycle water source heat pump technology and uses water rather than refrigerant as its main energy transfer medium. Local units are linked together by this neutral temperature water loop to form a complete system. Refrigerant charge is minimal and local to the Caloris unit, so it is not affected by the forthcoming F Gas regulations.

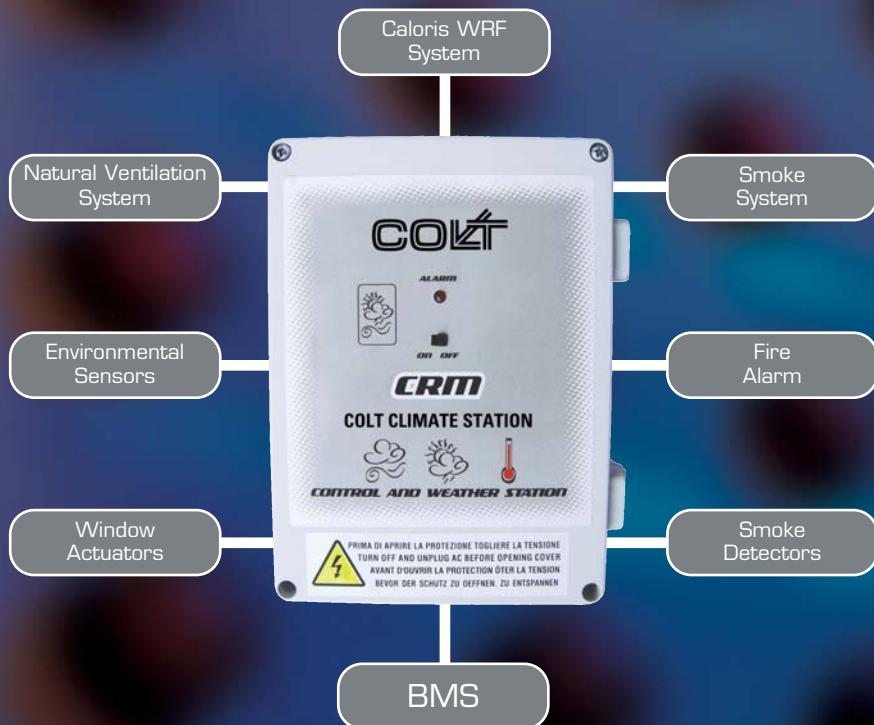


Caloris Indoor Units have a EER of between 3.7 and 6.4 and an Outdoor Unit has a EER of between 3 to 5 in winter and 4 to 5 in summer and can make use of the building mass, PCM (phase change material) or even a water reservoir (e.g. via a GSHP system) as a heat sink for both heating and cooling.

Caloris WRF can be seen operating at Sheffield University (Alfred Denny Building), Hatchcroft University, Farnborough 6th Form College and many other buildings throughout the UK and Europe.

\* Colt International Ltd has won the prestigious H&V Environmental Initiative of the Year Award 2009 for its development of the WRF Caloris system combined with ground source, for Hatchcroft University in Middlesex

# CONTROLS



Colt controls allow the automatic opening and closing of Colt window actuators and ventilators in case of high internal temperatures, smoke detection or CO levels in conjunction with external rain or wind alarm conditions detected by optional sensors.

COLT IN EDUCATION - **TRACK RECORD**

# TRACK RECORD



St Christopher's School



University of Portsmouth



University of London



Harefield Academy



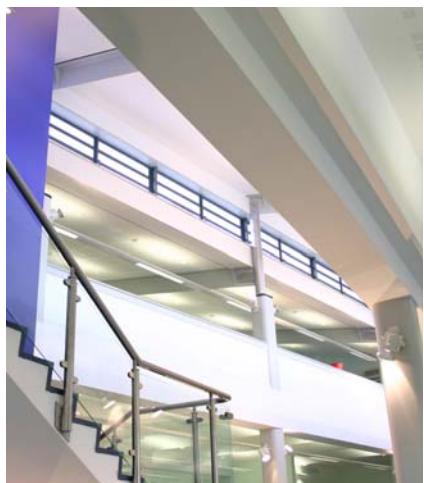
St Matthew's Academy



Harris Academy



St Matthew's Academy



University of Leeds



University of East London



St Matthew's Academy

## COLT IN EDUCATION - TRACK RECORD



**University of Plymouth**



**Northampton School for Boys**



**University of Leeds**

Blackburn Sixth Form College  
Canterbury Christchurch University  
Carmel College  
Cleeve School  
Cranfield University  
Edinburgh University  
Eyemouth High School  
Farnborough Sixth Form College  
Gladsmore Sports Centre  
Harris Academy  
Heathfield University  
Heriot Watt University  
Hertford Regional College  
Holyrood School  
James Square University  
Kingsley College  
Knowsley Schools

London School of Economics  
London School of Hygiene  
Malvern St James School  
Merrylee Primary School  
Middlesex University  
Napier University  
Oakington Manor Primary School  
Petchey Academy  
Peninsular Dental School  
Queen Margaret University  
Sheffield University  
Sherborne School  
Southampton University  
St Christopher's School  
St Matthew's Academy  
Tanaka Business School  
Telford College

University of Bristol  
University of Coventry  
University of Dundee  
University of Glasgow  
University of Hertfordshire  
University of Leeds  
University of Plymouth  
University of Portsmouth  
University of St Andrews  
University of Strathclyde  
University of Sunderland  
University of Worcester  
Uxbridge High School  
Woodbridge Sixth Form College  
Walthamstow Academy  
Warwick University

# Farnborough 6th Form College



**Project Brief**

To provide natural ventilation with dual purpose smoke control protection and winter heating to classrooms, atrium and corridors.

**Project Location**

Farnborough, UK

**Colt Solution**

Caloris WRF heat pump air conditioning units have been installed in the classrooms where the heat loads may at times become too high for natural ventilation. Caloris WRF has been designed to automatically function with the Colt natural ventilation system.

**Colt Products**

Colt window actuators

Coltlite glazed ventilators

Roof turrets

Caloris WRF

ICS4 Link controls

Kameleon glazed roof ventilators

**Architect**

Broadway Malayan

**Main Contractor**

Bowen PLC

**M&E Contractor**

Walsh Mechanical and Electrical

The Sixth Form College, Farnborough is one of Britain's top sixth form colleges. It has sought to retain and build upon its reputation as a distinguished major provider of the highest quality academic and vocational education.



*Actuators controlling both high & low level windows*



*Caloris WRF unit installed within purpose built bulkheads*



*Roof top double bank louvre turrets with internal controllable dampers to regulate the flow of air and eliminate rain entry.*

# Hatchcroft University



**Project Brief**

To provide an energy efficient HVAC solution for the Hatchcroft building

**Project Location**

Hendon, UK

**Colt Solution**

To provide a complete WRF and Ground Source Heat Pump package.

**Colt Products**

Colt Caloris WRF air conditioning system

**Architect**

BPR Architects

**Main Contractor**

Alfred McAlpine / Carillion

**M&E Contractor**

Rolton Group

**Ground Source Heat Pump**

Vertical closed loop borehole system

**Number of Indoor Units**

59

**Date of Completion**

Mid 2008

Colt has successfully linked its WRF air-conditioning system, Caloris, with Ground Source Heat Pump (GSHP) technology, to provide an energy efficient HVAC solution for the Hatchcroft building, a new, multi-million pound teaching and research facility, for Middlesex University.

The building, which has a capacity of 1,100 staff and students, has been designed to be both adaptable and sustainable, accommodating laboratories for Biomedical teaching and research, classrooms and associated facilities for Psychology, Computing and Sports Sciences.

Built in place of six, now demolished, buildings, the new development has achieved a 12% reduction in CO<sub>2</sub> emissions. Colt Caloris linked to GSHP was chosen as an energy efficient solution to assist in this reduction, as well as generally contributing to the University's ambition of achieving an "Excellent" BREEAM rating.

Throughout the building, 59 Caloris indoor units have been installed connected to a vertical, closed loop borehole, GSHP system. Taking up an area of approximately 1,400 m<sup>2</sup>, 55 boreholes have been drilled to an approximate depth of 60m, accommodating the GSHP's 32mm coil arrangement. The resultant HVAC solution can provide a capacity of up to 235 kW gross peak heating load and 190 kW net peak cooling load.

Colt was awarded this contract due to its ability to help integrate the complete package of works, from the design and installation of the GSHP system, to providing the link between the ground and the indoor Caloris WRF units.



*The Caloris WRF indoor units connected to a Ground Source Heat Pump system*

# PRODUCT SOLUTIONS

## Natural Ventilation



COLT NFV  
**Natural facade ventilator**



COLTLITE  
**Natural glazed louvred ventilator**



UNIVERSAL LOUVE  
**Screening or ventilation louvre**



CALORIS WRF  
**Water source heat pump**



LOUVRE TURRET  
**Ventilation louvre**



WINDOW ACTUATOR  
**Automatic opening device**

## Smoke Ventilation



EN SEEFIRE  
**Natural louvred ventilator**



METEOR  
**Natural flap ventilator**



LIBERATOR  
**Mechanical smoke extract ventilator**



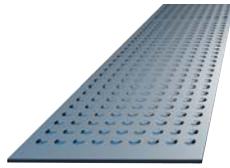
DEFENDER I/2  
**Smoke & fire damper**



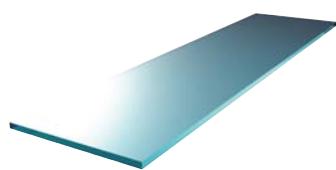
KAMELEON  
**Natural glazed flap ventilator**

# PRODUCT SOLUTIONS

## Solar Shading



**SHADOMETAL**  
Fixed or movable sheet metal louvre available in a wide range of patterns and finishes



**SHADOGLOSS**  
Glass louvre available in a range of tints, frits and clamping systems



**SOLARFIN**  
Fixed or movable elliptical extruded aluminium louvre



**BRISE SOLIEL**  
Fixed shading louvre



**TIMBER LOUVRES**  
Fixed or movable wooden louvres

## Controls



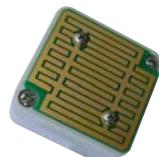
**COLT CONTROLS**  
Other control options available



WIND SPEED DETECTOR



TEMPERATURE SENSOR



RAIN SENSOR



CO SENSOR



SMOKE SENSOR

## THE COLT PACKAGE

Colt offer the following services:

Free no obligation survey.

Free no obligation design and advisory service.

Detailed scheme design for natural ventilation, smoke control and solar shading systems.

Caloris WRF heat pump air conditioning system design and supply.

Integrated solar shading systems with sun tracking louvres which can be integrated into any ventilation scheme design via our own sophisticated controls.

Provision of performance specifications.

Project and site management.

Supply, installation, commissioning and maintenance of all Colt Systems.

## OTHER REASONS TO CHOOSE COLT

Quality and safety underpin all our activities. We operate to strict quality and environmental standards including ISO 9001 and ISO 14001.

Over 75 years experience in the design, manufacture & installation of heating and ventilation systems.

Our innovative attitude and capability is backed up by our own manufacturing and test facilities.

## OUR MISSION STATEMENT

To meet the building occupiers' expectations of a comfortable and safe working environment utilising energy efficient products with the desire to be in full control of this environment at all times.

"People feel better in Colt conditions"

Architectural Solutions

Climate Control

Smoke Control

Service and Maintenance



## Colt International Limited

New Lane Havant

Hampshire PO9 2LY

Tel +44(0)23 9245 1111

Fax +44(0)23 9245 4220

[info@coltgroup.com](mailto:info@coltgroup.com)

[www.coltinfo.co.uk](http://www.coltinfo.co.uk)