

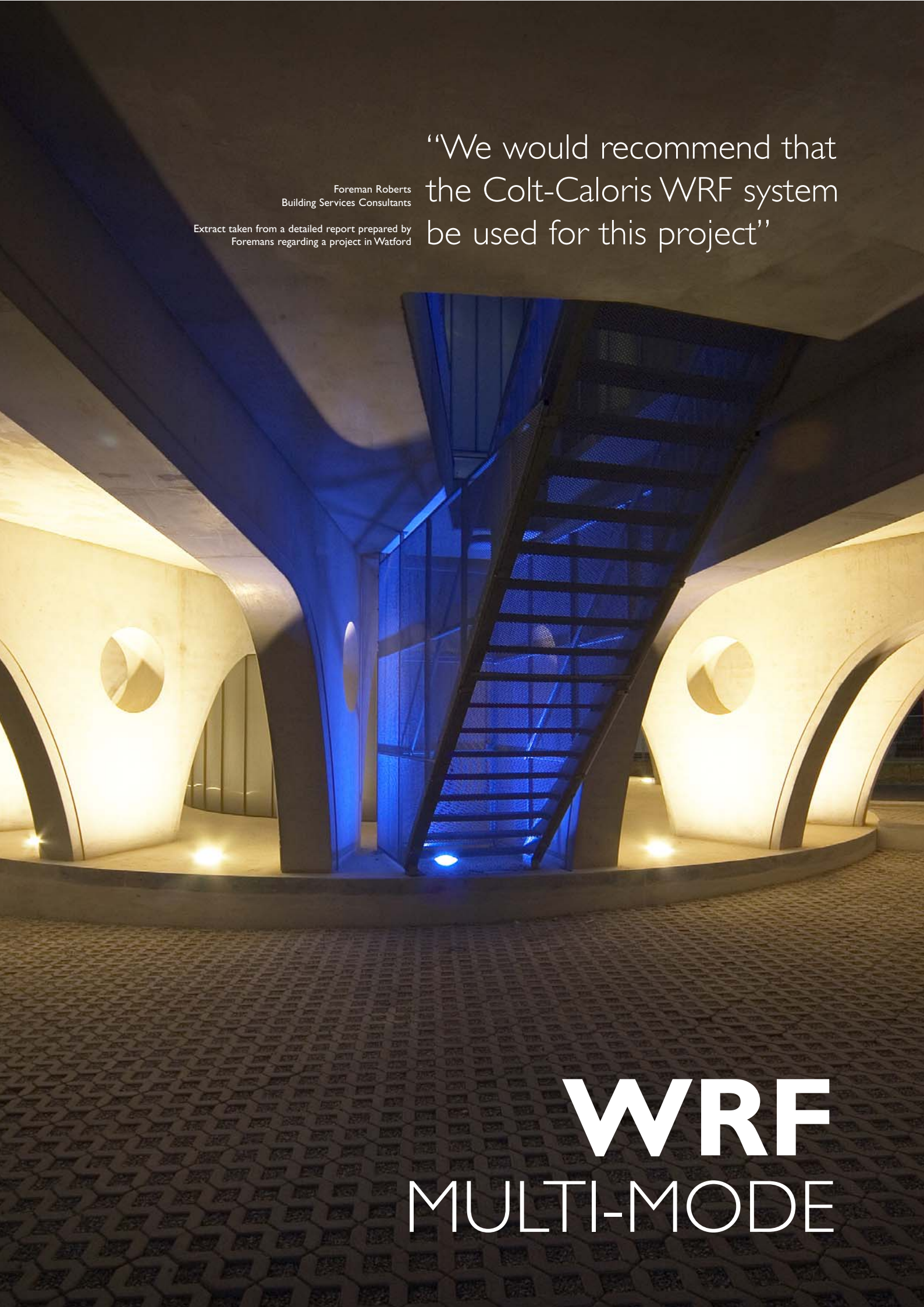
COLT

Colt Caloris <sup>WRF</sup>

Climate Control







“We would recommend that  
the Colt-Caloris WRF system  
be used for this project”

Foreman Roberts  
Building Services Consultants

Extract taken from a detailed report prepared by  
Foremans regarding a project in Watford

**WRF**  
MULTI-MODE

# WRF COLT CALORIS - INTRODUCTION TO CALORIS



## WHY IS COLT WRF CALORIS UNIQUE?

WRF - water and refrigerant flow. Colt Caloris is a reversed cycle water source heat pump that forms part of a WRF system.

Colt-Caloris **patent EP 1347253** encompasses a wide range of features that sets it apart from the competition. Its design makes it highly efficient and environmentally friendly.

Colt has utilised over 75 years experience of solving climate control problems, to take a fresh approach to the challenges associated with air conditioning. Investigations have resulted in advanced, safer and 'greener' performing systems.

## BENEFITS

Colt-Caloris is an ideal alternative to both conventional air conditioning and reverse cycle heat pump systems and includes benefits such as;

- **High unit COP, up to 4.3**
- **System allows unlimited number of units to be installed**
- **Uninsulated plastic piping**
- **Low noise levels (NR 28 - 35)**
- **Flexibility for future expansion**
- **Individual control for heating and cooling**
- **Neutral temperature of water system (between 15°C and 30°C)**
- **Slimline ceiling void unit, only 247mm high**
- **Maintenance-free horizontal compressor**
- **Two pipe system - a simpler install and reduced space requirements**

## UK MANUFACTURE

Colt-Caloris is manufactured for world wide distribution at our Havant factory.





### **Energy savings and the environment**

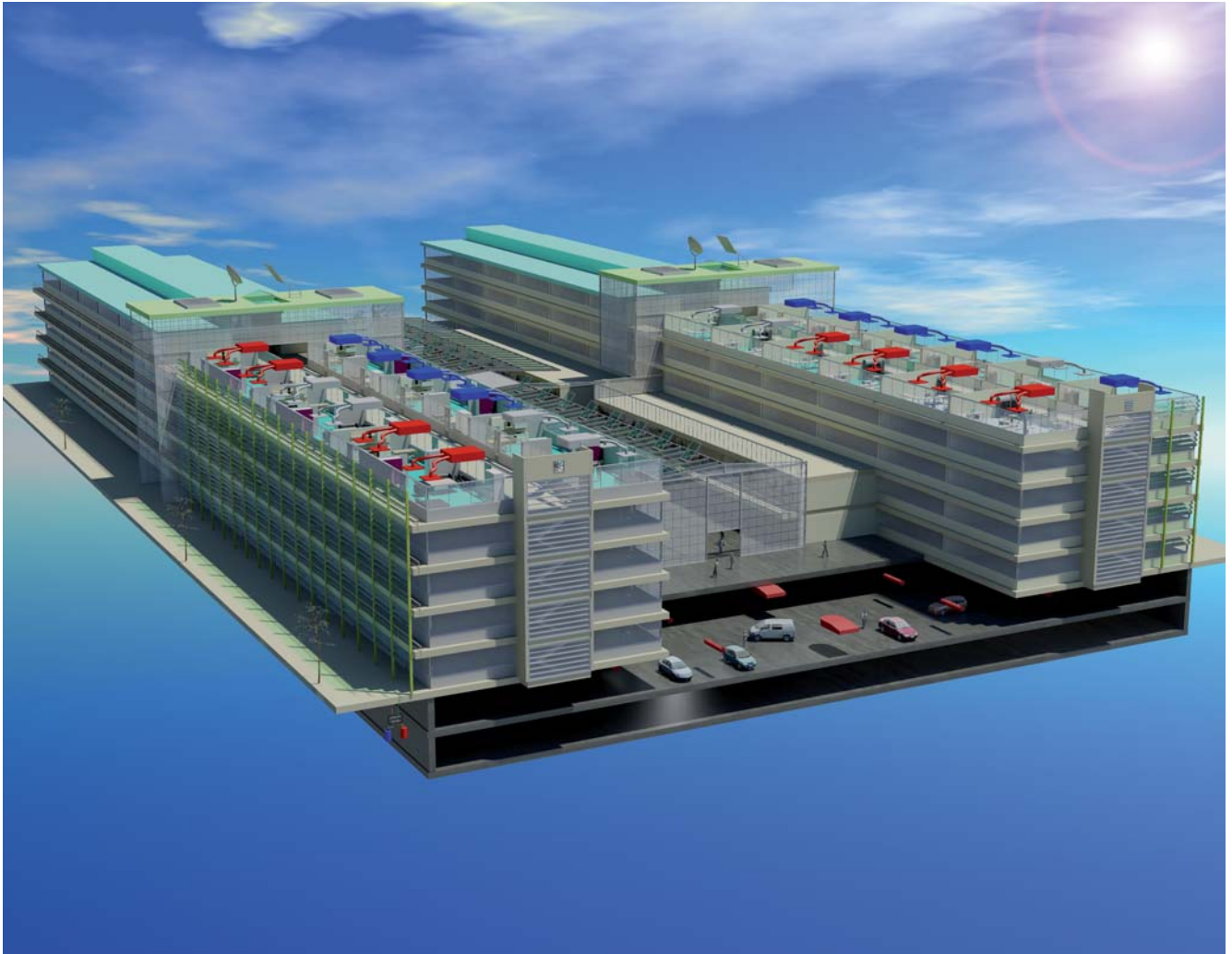
Colt-Caloris has a high COP/EER ranging from 4 to 6 depending on the ambient temperature.

The overall system performance has a COP/EER of approximately 4.5.

No other refrigerant-based air conditioning system of equivalent capacity contains a lesser charge of refrigerant. This reduces its potential environmental impact, **and the need for F-Gas inspections.**

# **WRF** SYSTEM OVERVIEW

# WRF COLT CALORIS - THE SYSTEM OVERVIEW



## **Low Noise Levels**

All local Colt-Caloris units incorporate a small refrigerant compressor which, of course, generates some noise. By implementing strategically placed anti-vibration mounts, cradle supports, special metal compounds and attenuation, Colt have been able to produce the quietest running units on the market.

All sizes have been independently tested and verified by Eurovent Certified laboratories.

## **Decentralised Individual Control**

Everybody has their own personal comfort level. The Colt-Caloris system allows every local unit to operate at any mode and temperature chosen by the user, irrespective of the location of the units.

Colt-Caloris systems afford freedom to heat and cool at the same time without modifications to the standard system.

## **Total Heat Recovery**

All units are connected to the same water system, mutually exchanging heat.

Colt-Caloris units achieve an extremely high recovery of thermal energy, irrespective of their position on the water system.

When embedding the pipework into the concrete structure of the building, thermal capabilities will be further increased.

## **Unit Design**

At just 247mm high, the horizontal units are the slimmest on the market and are designed to easily fit within most ceiling voids.

## **Pipework**

Unlike alternative systems, there is no limit to the pipework length. The system can use high quality, low cost, polymer piping unlike DX systems which require insulated high pressure pipework.

Colt-Caloris pipework is uninsulated: indeed, the system actually performs better without insulation. Utilising just two water pipes plus a condensation line significantly reduces space requirements and installation time.

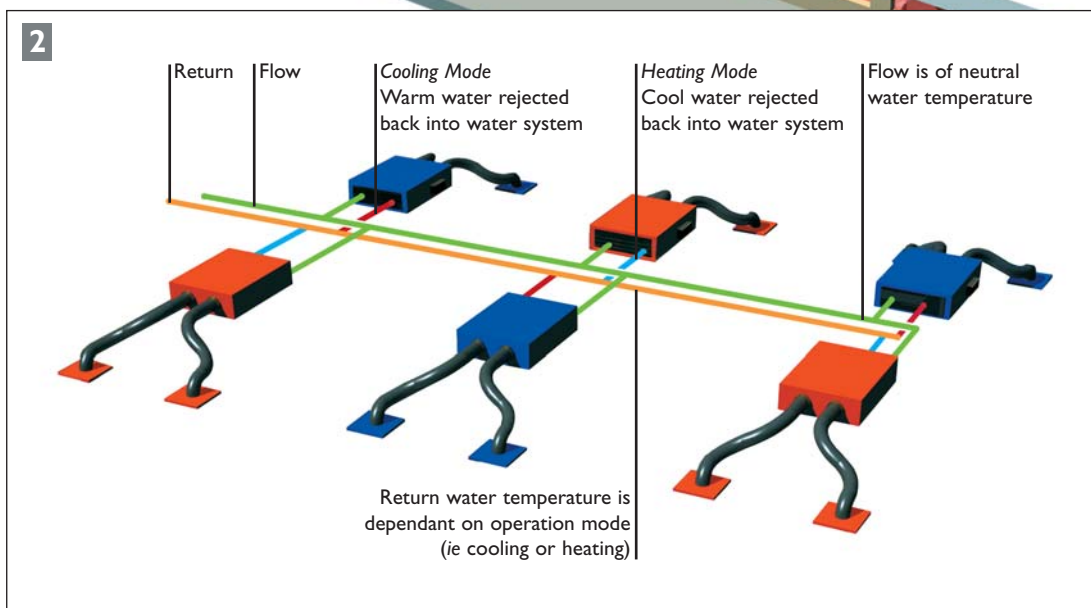
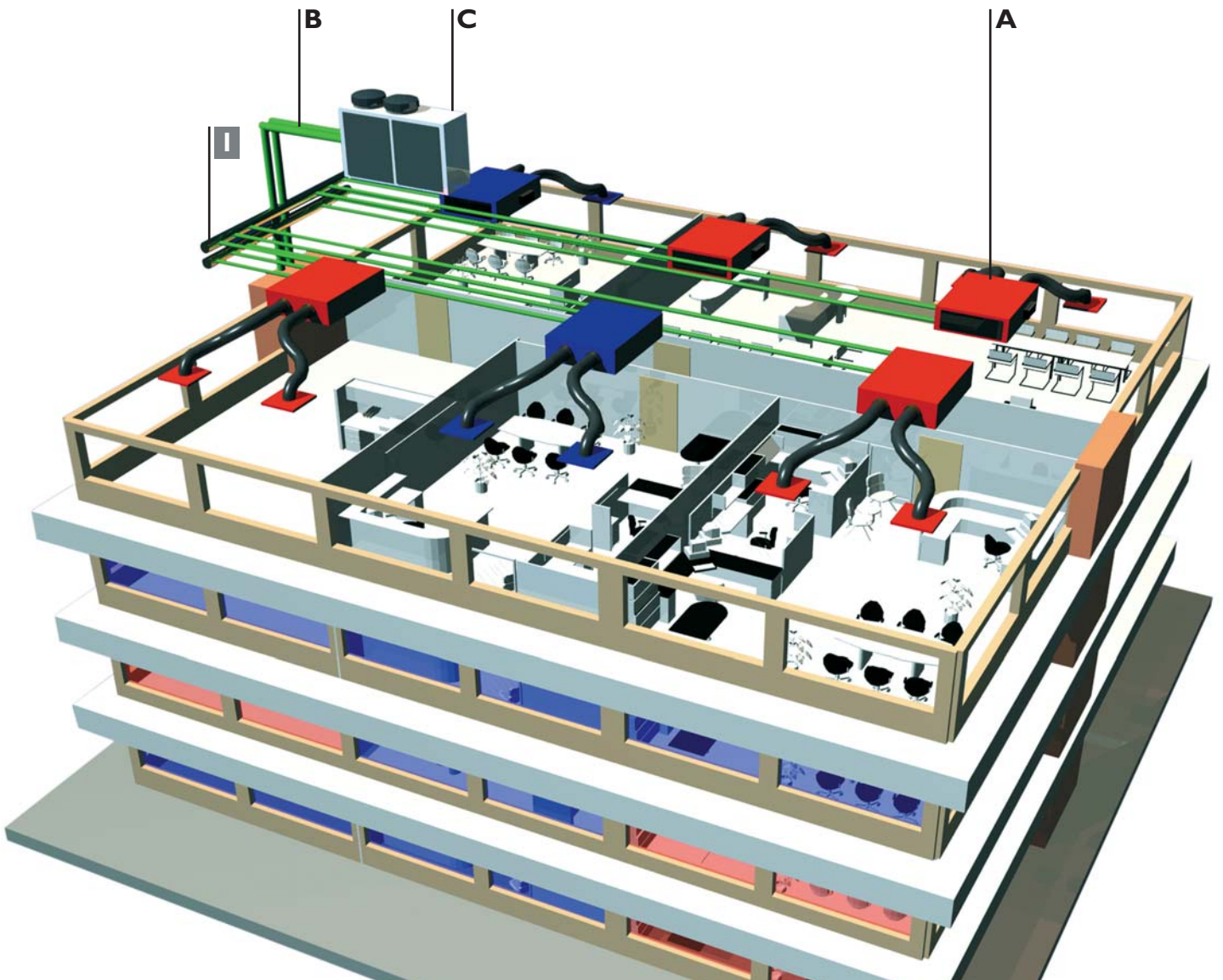
The length of the piping is unlimited, as is the number of units. 20 units or 2000 units, the Colt-Caloris system is completely flexible.

## **Reliability**

If in the unlikely event of a single unit failing, the other units will not be affected and the system will remain fully operational.



# WRF COLT CALORIS - THE SYSTEM



# WRF COLT CALORIS - THE SYSTEM

## HOW DOES IT OPERATE?

Colt-Caloris is based solely on heat pump technology. A central heat pump **C** is installed in a suitable location and local units **A** or **D** are installed within the ceiling voids or within the rooms. Each local unit also contains a heat pump.

The transportation of energy takes place by using water **B** which is at approximately the same temperature as the rooms within the building. The local reverse cycle units use this neutral water to either warm up or cool down the air already circulating within the rooms.

Systems can be installed traditionally or by embedding the pipes in the concrete floors. This makes use of the building's thermal mass.

The central heat pump is utilised to maintain the neutral temperature on the water pipework system.

Typically, for approximately 85-90% of the year, the water system is expected to remain at this neutral temperature, requiring no external energy from the central heat pump.

- A Colt-Caloris Local Heat Pump**  
An individual ceiling void local heat pump within each room that converts the energy in the water to energy in the air
- B Water System**  
Uninsulated plastic piping to facilitate a balanced flow of water to all local heat pumps at an average of 21-22°C
- C Central Heat Pump**  
A central external heat pump converts the energy in the air to energy in the water, maintaining the water loop system at no lower than 15°C and no greater than 30°C

**1 Manifold installation option**

**2 Simple flow & return installation option**

## WRF COLT CALORIS - INDOOR UNITS



### COLT-CALORIS LOCAL HEAT PUMP

Each internal space or room contains its own local unit, installed horizontally within the ceiling void or around the perimeter within the room.

Units can be operated in such a way that units on the warmer part of the building cool, and transfer the thermal energy to units on the cooler side of the building. No other system has provided individual users with this level of control and flexibility without making modifications and concessions to the main system.

The operation of this unit is based on a reverse cycle heat pump within the individual unit. The heat pump includes a refrigerant circuit with both refrigerant to air and refrigerant to water heat exchangers.

A reversing valve enables each heat exchanger to act as either an evaporator or a condenser.

A small charge of refrigerant circulates only within each unit, unlike other systems which pump refrigerant throughout the whole building.

In the unlikely event of one unit failing, all the other units will carry on working independently, making the Colt-Caloris system extremely reliable.

A remote room controller sets the personal temperature, air speed and desired mode, heating, cooling or recirculate.

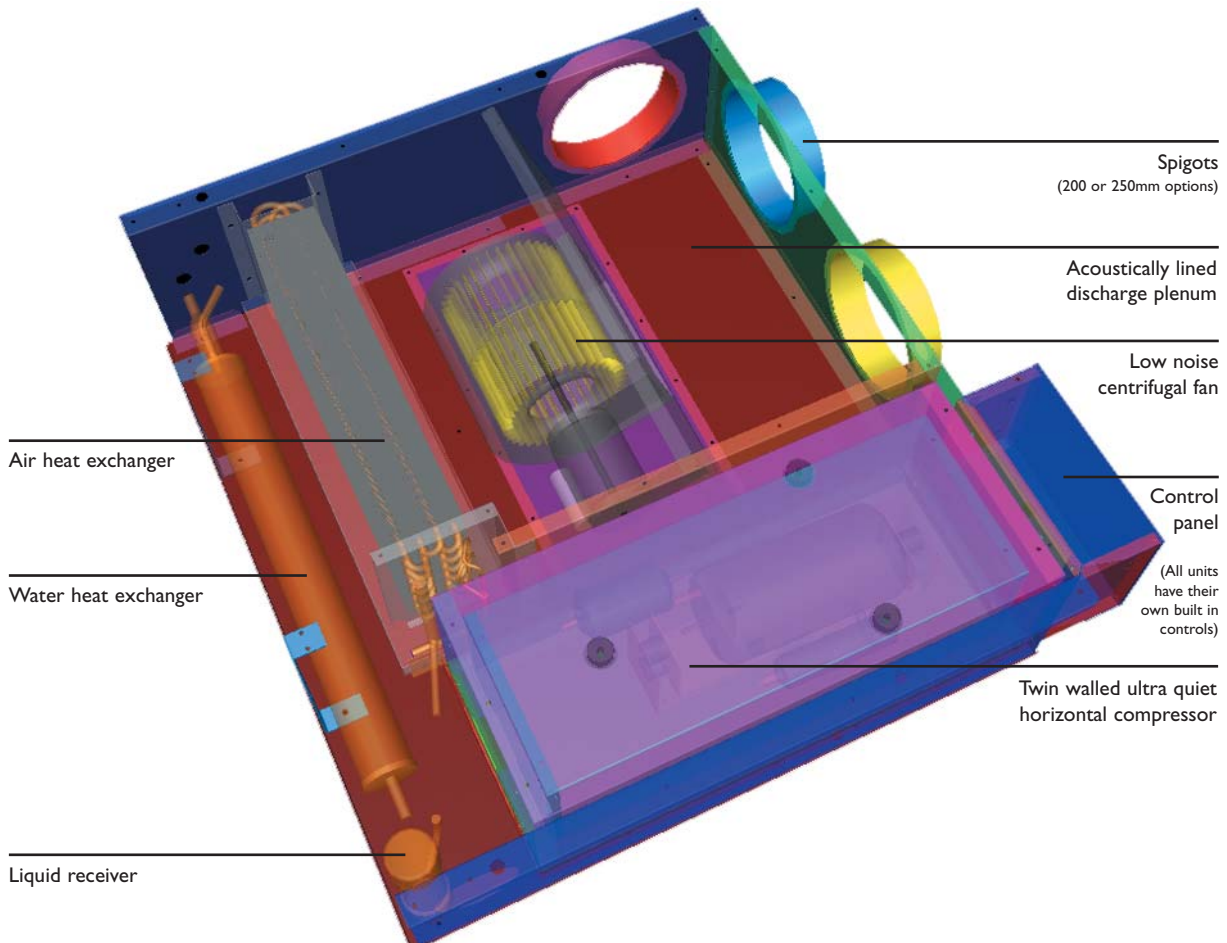


## FULL COMPRESSOR ENCLOSURE

Reducing noise levels is crucial for any type of air conditioning system. Colt has focused in particular on the design and manufacture of the compressor housing within the local heat pump unit. The result is the quietest running water source heat pump unit available today, thanks to its unique noise suppression system. The compressor is suspended on twin sets of anti-vibration mounts. Both mounts are further suspended onto the housing which is also sealed and insulated away from the rest of the unit.

During the development of the product, any additional noise provided by the integral horizontal compressor has been successfully absorbed, to within approximately 0.5dB to 1.0 dB sound power level contribution, using very effective noise attenuation.

The fan decks are state of the art and help make the Colt-Caloris one of the quietest water source heat pump systems on the market.



## WRF COLT CALORIS - OUTDOOR UNITS



### *W-Series external heat pump*

#### CENTRAL HEAT PUMP

The purpose of the external heat pump is to maintain the optimum temperature in the water loop between 15°C and 30°C, but since the building's mass helps to maintain the water loop temperature, this heat pump is rarely in operation.

The central heat pump will remain on stand-by for around 85-90% of the year.

#### UNIT TECHNICAL DATA

The Colt outdoor heat pump units are available from 20kW up to 300kW depending on the size of the system.

Unit sizes and technical data are available at [www.coltinfo.co.uk](http://www.coltinfo.co.uk).

#### OPERATION IN SUMMER

During the summer months, the central heat pump operates like a chiller unit but with greater efficiency, dissipating heat. Most water chiller systems operate around 5°C to 14°C whereas the Colt outdoor unit only starts up when the water temperature exceeds 28°C to 30°C.

It is much easier to cool water at 28°C than it is at 12 - 14°C. As a result the heat pump works at a higher efficiency for less time during the day. As soon as the water temperature reaches the normal specified level, the unit stops and waits until the water becomes excessively warm again, thus saving energy.

#### OPERATION IN WINTER

In winter, most internal rooms will require warm air. The local heat pumps take the heat energy out of the water loop which finally causes a heat deficiency within the system. The system copes with this by taking the cold external air and cooling it further, then transferring this heat energy into the loop. When outdoor units are de-icing, the indoor units continue to heat.



# WRF COLT CALORIS - OUTDOOR UNITS



*External units can be installed away from the main site if necessary as was the case at the Premier Inn Hotel, Wolverhampton.*

*Zon Holland Auction House with front offices spanning 3 floors.*



*Low profile roof units installed at the prestigious 5 star Luton Hoo Hotel*

- Uninsulated
- Unlimited in length
- Speed of installation
- Can be embedded within the floors
- Water not refrigerant carried at a neutral temperature (15 - 30°C)
- Closed water pipework system
- Plastic, copper or steel

### NEUTRAL WATER SYSTEM

The whole basis behind the Colt-Caloris system is to circulate water around the building between the local units and the central heat pumps at 15 °C to 30 °C thus minimising losses whilst saving energy.

All the local units and external mounted heat pumps are connected by a main two pipe, water system.

With the temperature of the water being neutral, insulated piping and traditional copper piping are not needed. Plastic piping can be used offering many cost and reliability benefits.

The pipes can be quickly installed into the system without any risk of condensation.

- **No refrigerant circulating through the building**
- **Simple, non-specialist pipe installation**
- **Easily modified or extended**
- **Unlimited lengths.**

### POLYMER PIPING

Piping for the water system can be made from smooth polymer, with an expected life span of over 50 years.

Piping is tested to BS 7291 and listed in the WRAS (Water Regulations Advisory Scheme) and is BBA Approved.

Polymer piping has many exceptional physical properties including:

**Resistance to stress crack formation**

**Long term stress rupture resistance at high temperatures**

**Kink resistance**

**Exceptional thermal ageing resistance**

**Chemical resistance and completely non-corroding.**

### ADDITIONAL OPTIONS FOR CONTROLLING THE WATER SYSTEM

On refurbishment projects, a heat injection source, such as a boiler system, may already be installed within the building. Similarly, a heat rejection source, such as a chiller unit or evaporative cooling tower may also be installed. If this is the case, then a central heat pump is not required and the system can be reconfigured to make use of existing systems.

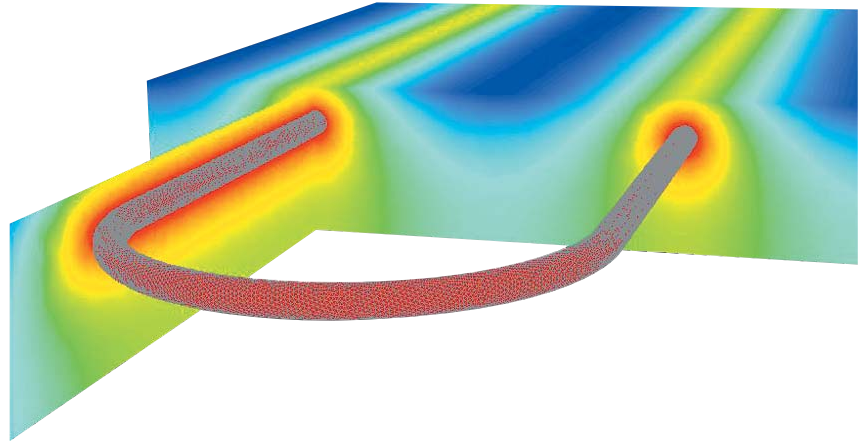
Ground coupled (long term) storage systems can be very beneficial and can even be capable of solely serving the water loop all year round depending on local geothermal situations.

Please contact Colt for further information.

***“Pipework runs can be unlimited in length”***



# WRF COLT CALORIS - THERMAL MASS



**“Pipework run outs can be embedded within the floor to provide extra thermal mass”**

## THERMAL ENERGY

The ideal scenario is for the water system to utilise the building’s thermal mass as an additional energy store. Pipes can be laid into the building’s concrete structure, taking advantage of the free thermal energy, which in turn can be stored and re-used later in the day.

Reducing energy consumption and the impact industry has on the environment has always played an important strategic part in the philosophy of Colt.

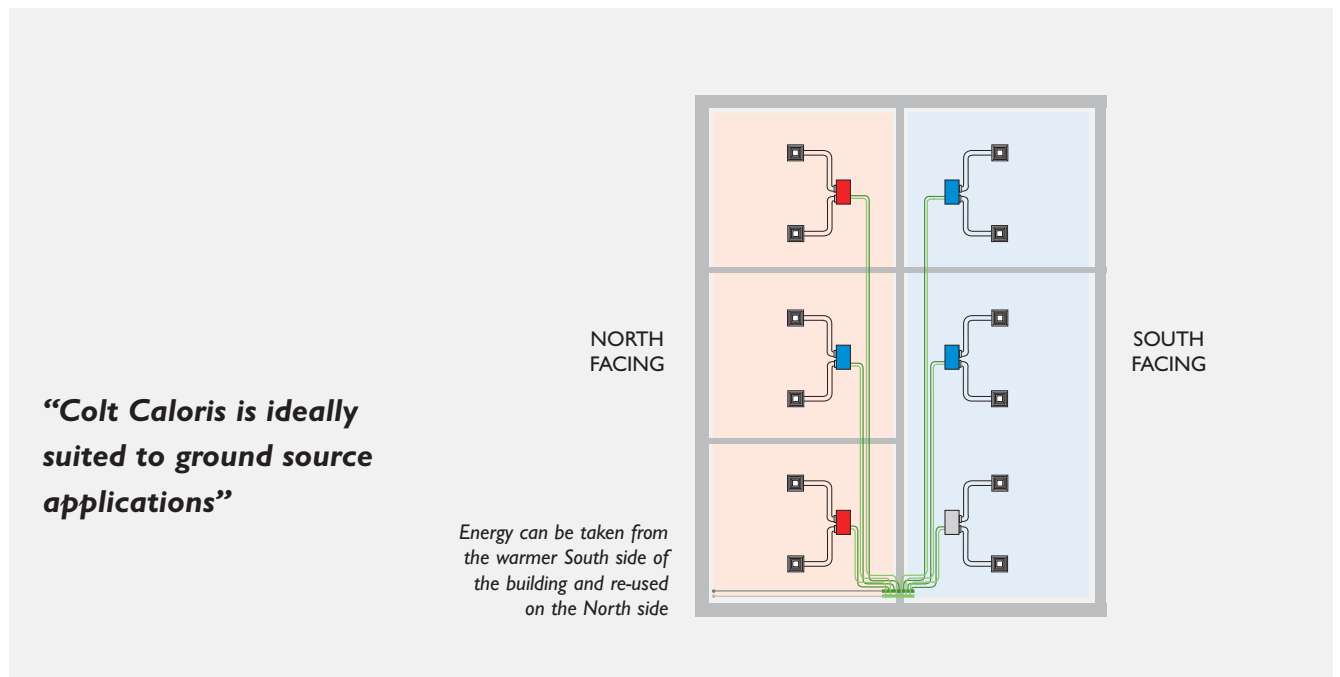
The Colt-Caloris system contains lower quantity of refrigerants compared to any other air conditioning system, yet the key

feature is the energy efficiency due to the neutral water pipework system.

Local heat injection is achieved by utilising ‘wasted’ heat coming from kitchens, hotel rooms, plant rooms, offices, IT rooms or collectively from South facing rooms.

Local heat rejection may be achieved by the re-use of energy from units in the heating mode, for example, those found on the North facing side of the building.

## HEAT REJECTION



**“Local Indoor Caloris units  
are not subject to F-Gas  
inspections”**

***In an attempt to limit emissions of F-Gas in the EU, the European Commission passed a new series of Regulations in the European Parliament in July 2006, that focus on containment and traceability.***

***These emerged from recommendations of the European Climate Change Programme and are modelled on a system put in place in the Netherlands from March 1993, known as STEK. This has reduced Dutch emissions of F-Gases on average, to 1.5% of charge per year in fixed cooling systems, and 4.5% in total including cooling systems found in transport, compared to 11% over the EU as a whole (& 9% in UK)***

***The prime objective of the F-Gas Regulations will be to prevent leakage, misuse and to ensure repairs are undertaken as soon as possible after a leak is detected.***

# F-GAS LEAK DETECTION



# WRF COLT CALORIS - CALORIS & THE ENVIRONMENT

F-Gases (fluorinated gases) are synthetic compounds, forming part of a basket of six greenhouse gases, that the EU has committed to reduce by 8% below 1990 levels before 2012, as defined by the Kyoto Protocol.

Current F-Gases, which include HFC134a, 407C and 410A, cause 1,300 to 1,890 times more global warming than a similar mass of CO<sub>2</sub>.

These compounds are increasingly prevalent, as they continue to replace the harmful, banned CFCs and HCFCs which have serious potential to deplete the ozone layer.

**“The local indoor Colt Caloris units contain less than 3kg of refrigerant and are therefore not subjected to F-Gas inspections.”**

## F GAS - VRF SYSTEMS

### Climate Change

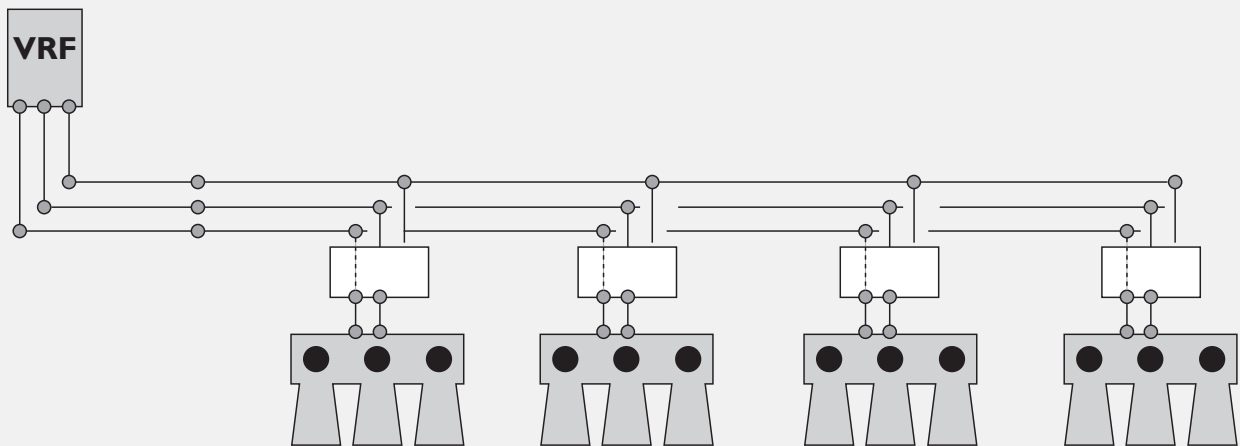
Loss of refrigerant = Less efficiency = More energy input to drive the system = more CO<sub>2</sub> produced than necessary

Responsibility lies with the End User

Up to 2-4 checks a year (depending on the charge of gas)

Large penalties - For the End User & Refrigerant Handler

Every 1kg of R410A refrigerant leakage is the equivalent of releasing 1800kg of CO<sub>2</sub> into the environment



## CONTAINMENT

It is only when the gases escape into the atmosphere that they become harmful, one of the key approaches to dealing with F-Gases is containment.

This involves ensuring that the equipment is leak-tight, that installation and servicing personnel are well trained and that F-Gases are carefully handled and fully traced at all stages of the refrigerant's life.

**“VRF systems can operate with minor losses of charge but the efficiency (COP & EER) are gravely affected. One leading VRF manufacturer has calculated a 15% loss can cause a 50% reduction in efficiency! in other words a doubling of energy input and hence emissions, without being warned.”**

## REGULATIONS

- In force 4th July 2007
- Objective to prevent leakage
- All pipework and joints, connections
- Responsibility on end user - inc. record keeping on refrigerant quantity - legal penalties
- 3kg+ inspection every 12 months
- 30kg+ inspection every 6 months
- 300kg+ inspection every 3 months (plus installation of leak detection kit)
- Further inspection one month after a leak has been repaired.



# UK PROJECTS



# WRF COLT CALORIS - UK PROJECTS



**Premier Inn - Wolverhampton**



**Sheffield University**



**Daimler Chrysler HQ - Milton Keynes**



**Luton Hoo Hotel - Luton**



**Hatchcroft University - Middlesex**



**Princess Alexandra Hospital - Harlow**



**Ramada Hotel - London**



**IBM - Hursley**



**Marks & Spencer - White City**



**HBOS - Bristol**



**Liverpool One - Liverpool**



**Abford House - London**



**Exchange Flags - Liverpool**



**Penninsular Dental School - Plymouth**





# OVERSEAS PROJECTS



# WRF COLT CALORIS - OVERSEAS PROJECTS



**Eekhout - Holland**



**Haasnoot Brugen - Holland**



**Kantoor Villas - Holland**



**Credit Force - Holland**



**Nic Oud - Holland**



**Veldzigt Park - Holland**



**Pre Wonen - Holland**



**Technocircle - Holland**



**Thomann - Germany**



**Ziengs Shoes - Holland**



**VNV Media - Belgium**



**Berntsen & Braam - Holland**



**Sofitel Hotel, Vienna - Austria**

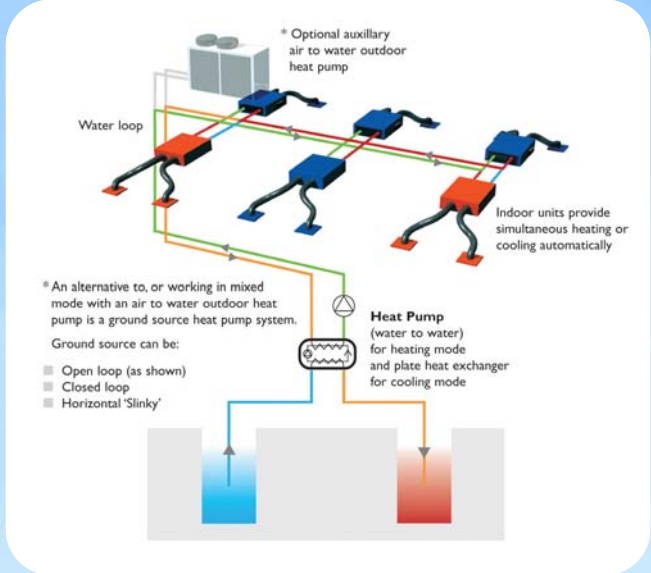
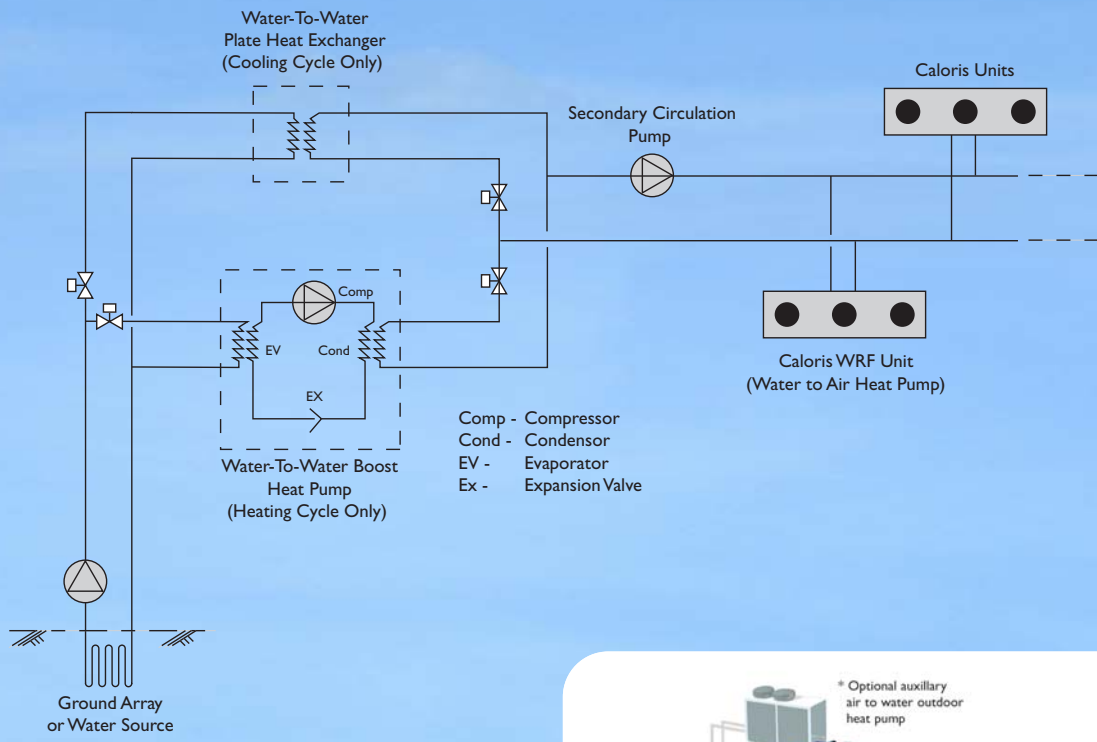


**Daneels - Belgium**



**Zon - Holland**





Typical installation layout

# PROJECTS

## GROUND SOURCE



# WRF COLT CALORIS - GROUND SOURCE PROJECTS



**Hatchcroft University - Middlesex**



**Ramada Hotel - London**



**Meerpal Business Park - Holland**



**Gooch & Housego - Somerset**

## **Hatchcroft University - Middlesex**

Ground source system consisting 55 bore holes at 60 metres deep providing a capacity of 235kW gross peak load and 190kW net cooling load.

## **Ramada Hotel - London**

Hybrid ground source and part airsource linked to 230 indoor Caloris units.

## **Meerpal Business Park - Holland**

A borehole ring main system has been extended across the business park to connect all buildings together. At regular intervals, two 100 metre deep bore holes - one for storage of cooler water and the other for warm water.

## **Gooch & Housego - Somerset**

A lake provides base load heating and cooling supplemented by auxiliary heating and cooling.



*Colt International Ltd won the prestigious H&V Environmental Initiative of the Year Award 2009 for its development of the WRF Caloris system combined with ground source, and a hybrid ground source/air source solution. Projects include Ramada Hotel in London and Hatchcroft University in Middlesex. This award recognises innovation, environmental awareness and the development of new initiatives which take meaningful steps toward safeguarding the environment.*

# WRF COLT CALORIS - COMPARISONS WITH OTHER SYSTEMS

## COMPARING FOUR PIPE FAN COILS AND VRF SYSTEMS

	4 Pipe Fan Coils	VRF	WRF/Colt Caloris
<b>Low install cost</b>	No	Yes	Yes
<b>Avoid refrigerant leak detection</b>	Yes	No	Yes
<b>Use building thermal mass to minimise energy use</b>	No	No	Yes
<b>Oil return cycle (No Output for Input Energy)</b>	No	Yes	No
<b>Comprehensive range of indoor units</b>	Yes	Yes	No
<b>Avoid F-Gas Regulations for annual inspection internally<sup>(2)</sup></b>	Yes	No	Yes
<b>Defrost cycle, hence draughts from indoors</b>	No	Yes	No
<b>Low running cost</b>	No	No	Yes
<b>Energy efficiency/output loss over 5m pipework</b>	No	Yes	No
<b>Energy recovery between units heating and cooling</b>	No	Maybe <sup>(1)</sup>	Yes
<b>Number of pipes</b>	4	2 or 3	2
<b>Pipework insulation required</b>	Yes	Yes	No
<b>Integrated controls</b>	No	Yes	Yes
<b>Standard design conditions</b>	European	Asian	European

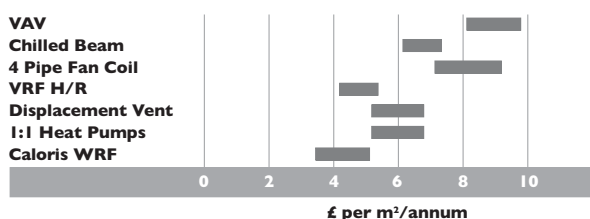
## COMPARING THE COLT CALORIS WRF SYSTEM AND WATER COOLED VRF SYSTEMS

	Water Cooled	Caloris WRF
<b>Circulation medium</b>	Refrigerant	Water
<b>Pipe-work</b>	Copper	Choice Inc Polymer
<b>Pipe insulation</b>	Required	Not Required
<b>COI/EER</b>	Good <sup>(1)</sup>	Good
<b>Use of building (or other)thermal mass for energy storage</b>	No	Yes
<b>Internal branch boxes</b>	Required	Not Required
<b>F-Gas Inspection (Internal)</b>	Yes <sup>(2)</sup>	No
<b>Refrigerant install qualified</b>	Required ACRIB <sup>(2)</sup>	Plumber Only
<b>Integrity on fault</b>	Whole System Fails	Just One Unit Fails
<b>Piping length</b>	Limited	Unlimited
<b>Piping height</b>	Limited	Unlimited

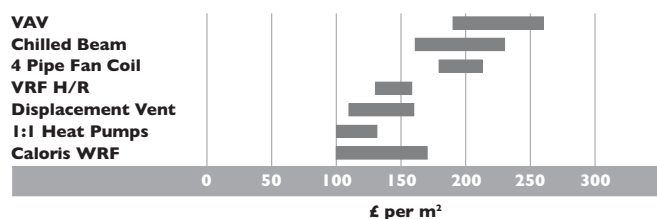
<sup>(1)</sup> However the COP/EER drops considerably in actual use as the compressor has to pump high pressure/velocity refrigerant around the system and the standard separation is only 5 (five)m in total. On average the COP will reduce by some 10% and EER by 15% for separations over 50m.

<sup>(2)</sup> From 27th July 2007 'F' Gas regulations came into force with traceability, monitoring and revised installation standards.

### RUNNING COST COMPARISON (Office UK)



### INSTALLATION COST COMPARISON (Office UK)





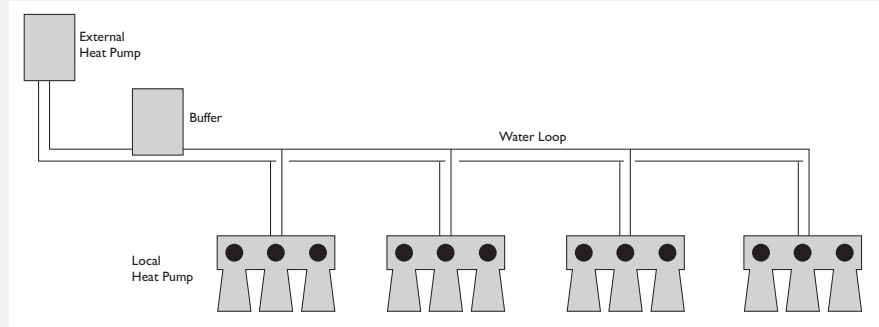
# WRF COLT CALORIS - COMPARISONS WITH OTHER SYSTEMS

## CALORIS - TWIN PIPE SYSTEM

### Advantages

2 pipe uninsulated plastic pipework & unlimited pipework length/heights & unlimited system capacity & number of indoor units.

Simultaneous heating & cooling with energy recovery between units and potential for energy saving through thermal mass.



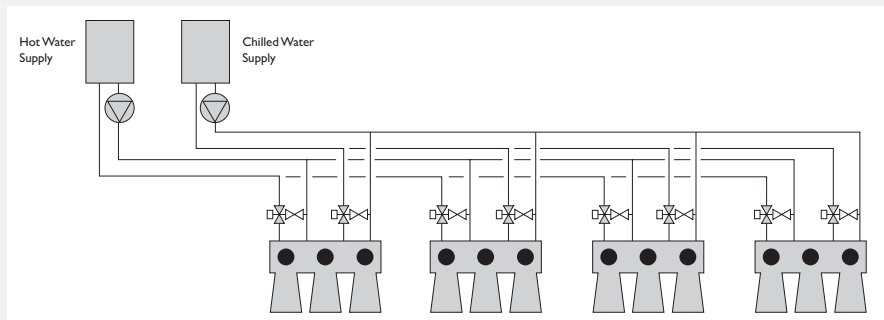
## 4 PIPE SYSTEM

### Disadvantages

Additional installation/cost of pipework (4 pipes).

Insulated pipework always required to avoid condensation and heat losses.

No heat recovery between systems which both use energy concurrently.



## VRF HEAT RECOVERY SYSTEM (3 PIPE OR R SERIES)

(Accounts for 90% of VRF Installations in UK)

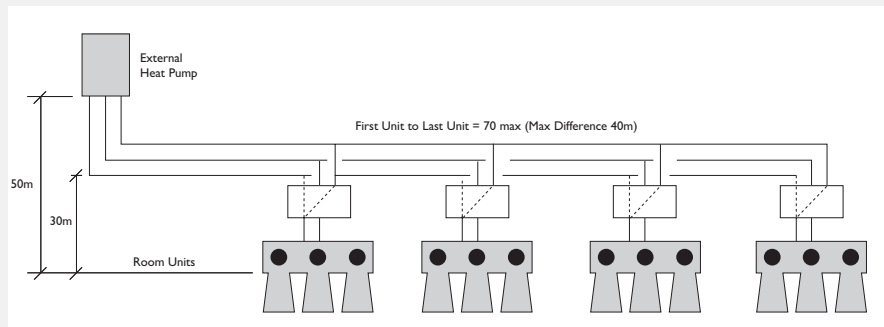
### Disadvantages

Additional installation/cost of pipework & changeover box and space.

Refrigerant fills the whole pipework system = quantity = F Gas.

Restrictions on length of pipework  
Insulated copper pipework carrying refrigerant (R410A) 450psi wp.

Leak detection to be considered for every room



## WATER BASED VRF HEAT RECOVERY SYSTEM

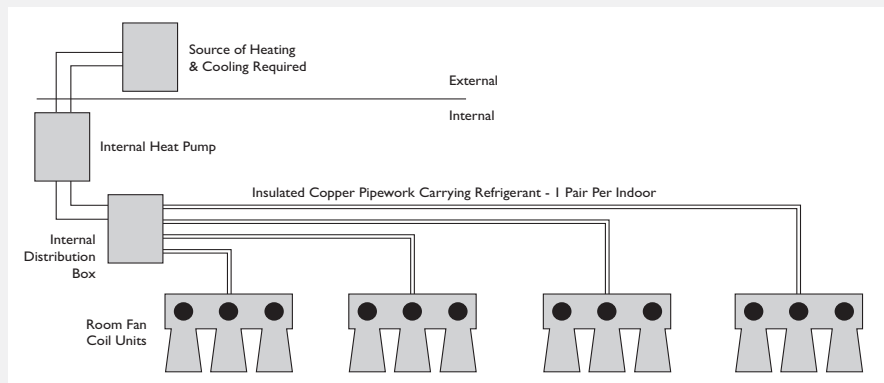
### Disadvantages

Space for distribution box(es)

Space for internal heat pump

Restrictions in pipework length

Complex multiple pipework



# WRF COLT CALORIS - PERFORMANCE INDOOR UNIT

	Size 1	Size 2	Size 3	Size 4
--	--------	--------	--------	--------

Cooling Performance @ 25 °C, RH 50%, Water 20/26 °C

Cooling Capacity	1508 W	2230 W	3360 W	4770 W
Compressor Power Input	316 W	442 W	652 W	871 W
COP Compressor Input Only	4.77	5.05	5.15	5.48
Unit COP (according to EN 255-2)	<b>4.11</b>	<b>4.21</b>	<b>4.65</b>	<b>4.72</b>

	Size 1	Size 2	Size 3	Size 4
--	--------	--------	--------	--------

Heating Performance @ 20 °C, Water 20/15 °C

Heating Capacity	1510 W	2350 W	3370 W	4135 W
Compressor Power Input	374 W	543 W	696 W	948 W
COP Compressor Input Only	4.04	4.33	4.84	4.36
Unit COP (according to EN 255-2)	<b>3.55</b>	<b>3.72</b>	<b>4.29</b>	<b>3.80</b>

Air Side Heat Exchanger

Model / Type	3/8" Curved Cu - tube with shaped aluminium fins			
Air Qty (speed 1) m <sup>3</sup> /h (l/s)	150/42	175/49	215/60	595/165
Air Qty (speed 2) m <sup>3</sup> /h (l/s)	180/50	260/72	445/124	800/223
Air Qty (speed 3) m <sup>3</sup> /h (l/s)	225/62	350/97	705/196	1230/342
Air Qty (speed 4) m <sup>3</sup> /h (l/s)	260/72	440/122	940/261	1465/407
Standard Static Pressure	30 Pa	30 Pa	30 Pa	30 Pa
Maximum Static Pressure	50 Pa	50 Pa	50 Pa	70 Pa

Water Side Heat Exchanger

Model / Type	Finned and Grooved Spiral Shell-in-tube			
Water Connections	15mm	15mm	15mm	15mm
Water - Minimum Flow l/s (l/min)	0.074 (4.5)	0.106 (6.4)	0.133 (8.0)	0.178 (10.7)
Waterside - Differential Pressure	1.0 kPa	1.5 kPa	2.0 kPa	5.0 kPa
Waterside - Max Pressure	20 bar	20 bar	20 bar	20 bar
Water Capacity	2.4 L	2.4 L	2.8 L	3.3 L

Noise Data (at standard power and speed)

Sound Power (SWL)	45 dB(A)	49.5 dB(A)	51 dB(A)	50.5 dB(A)
Typical Lp	28-33 dB(A)	32-37 dB(A)	33-38 dB(A)	31-36 dB(A)
Typical N R	23-28 dB(A)	26-32 dB(A)	27-32 dB(A)	25-30 dB(A)

Heat Pump

Compressor Type	Low Noise Cradle Hermetic Horizontal Rotary/scroll			
HCFC - Free Refrigerant	R134a	R407C	R410A	R410A
Refrigerant Quantity	0.395 kg	0.75 kg	0.75 kg	1.015 kg

Dimensions & Weights

	Dim A	Dim B	Unit Weight	Spigot Options
Unit Size 1	820	776	72 kg	1,2
Unit Size 2	980	936	80 kg	1,2,3
Unit Size 3	1280	1236	88 kg	1,2,3,4
Unit Size 4	1580	1536	108 kg	1,2,3,4,5

Electrical Data

Power Supply (V / ph / Hz)	230/1/50	230/1/50	230/1/50	230/1/50
Total Absorbed Power @ 30°C	0.5 kW	0.7 kW	0.8 kW	1.2 kW
Nominal Current Compressor/Fan	1.9 / 0.25 A	2.8 / 0.4 A	3.4 / 0.5 A	5.0 / 0.5 A
Max Starting Current	16 A	16 A	16 A	19 A
Minimum External/Internal Fuse	7 A	7 A	7 A	10 A
Max No. Units off 13 Amp Supply	4	3	2	2

† Digital controls only

Acoustical data are based on the report of Peutz & Associés BV (NL) and SRL Limited (UK) in accordance with EN ISO 3741:1999, EN ISO 5135:1999, BS 4856:1997 and Eurovent 8/2 1992. Sound pressure levels are based on measurements taken in a reverberation chamber with a half second echo and 8-4 kg/m<sup>2</sup> ceiling mass.

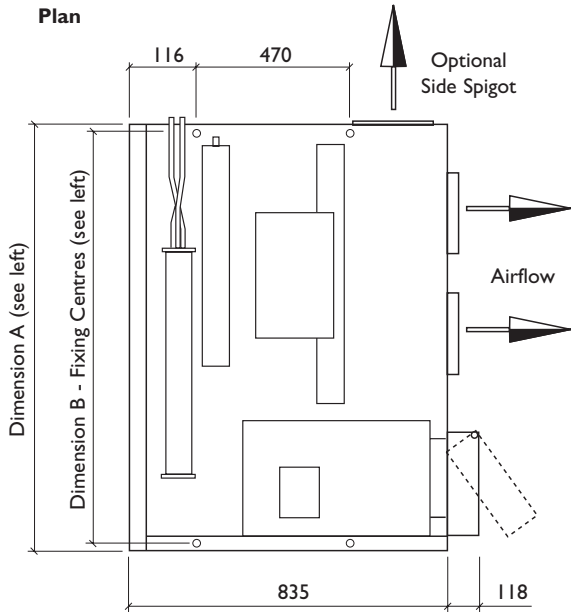
Performance data has been measured in a EN 14511-certified laboratory.

As with all heat pumps water flow is critical: It is essential to ensure that all flow rates are within CIBSE guidelines (w), ie 0% tolerance for underflow, 10% tolerance for overflow.

0% tolerance for underflow  
10% tolerance for overflow



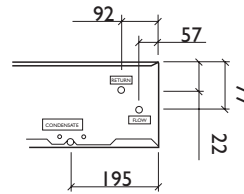
# WRF COLT CALORIS - DIMENSIONS INDOOR UNIT



**Side view**



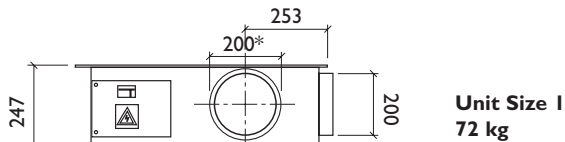
**Water Connections**



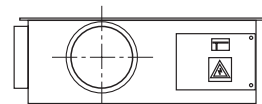
15mm diameter copper tails  
 Outlet - (Return)  
 Inlet - (Flow)

15mm diameter stainless steel  
 Drain - (Condensate)

**Left Handed**



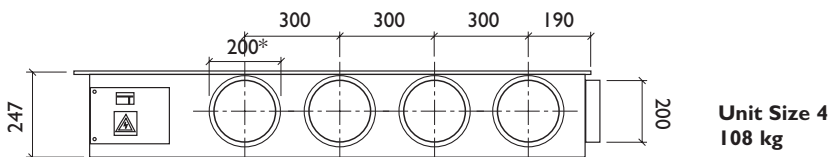
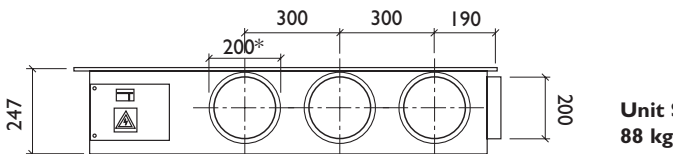
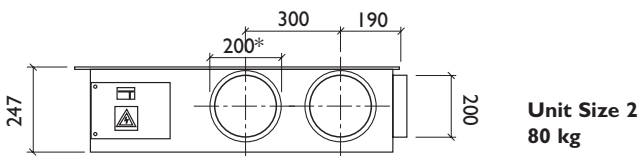
**Right Handed (Size 1 only)**



Standard spigot diameter is 200mm (sizes 1-4)

\*250mm diameter spigots are also available on request

A condensate pump is also optional.





# CONTROL SYSTEMS



# WRF COLT CALORIS - CONTROL SYSTEMS



Room controller shown in grey

Colt digital (LCD display) room control panels can be stand alone for a Caloris system or limited into central BMS systems via the following:

- Modbus ASCII / RTU
  - LON
  - BacNet
- } Easy plug-in boards

- Each room controller can control up to 16 units, providing temperature control.
- From a single controller you can operate temperature, fan speed or change from Auto to heating, cooling or de-humidification mode.
- Weekly timer
- Colt digital controls allow occupancy detection (ie - PIR) or hotel slip card system
- Easy commissioning and service by mini USB cable to any remote controller.

A central touch screen controller is also available on request.

## OPTIONAL CONTROLS



### Simplified Temperature Scale

For limited temperature adjustment against set point.



### +/- 3°C only

For limited temperature adjustment.

## OPTIONAL COLOURS



Black



Silver



White

## OPTIONAL BMS INTERFACES



- Modbus ASCII
- Modbus RTU
- LON
- BacNet

## THE COLT PACKAGE

We offer the following services:

Free no obligation survey.

Free no obligation HVAC design and advisory service.

Detailed scheme design for natural ventilation systems, for both industrial and commercial buildings.

Caloris WRF heat pump air conditioning system design and supply.

Provision of performance specifications.

Project and site management.

Supply, installation, commissioning and maintenance of all Climate Control 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.



Colt offer integrated natural ventilation, solar shading, smoke control and air conditioning systems. See [www.multimodeventilation.co.uk](http://www.multimodeventilation.co.uk) for further details

## Our Mission Statement

To meet the building occupiers' expectations of a comfortable and healthy 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)