

COLT

Coolstream
Adiabatic Cooling System

Climate Control



Colt Coolstream is a natural cooling system which employs the principle of adiabatic evaporation. Evaporative cooling is an efficient and effective alternative to conventional air conditioning. This is particularly so in storage or production facilities, where these buildings are simply too large for air conditioning to be cost effective.

The process involves drawing hot dry air across wetted media, which results in an exchange of energy and a significant reduction in the temperature of the air. The warmer the outside temperature, the more efficiently evaporative cooling works. Above 30°C, the air can cool down adiabatically by 10°C or more, resulting in very efficient cooling. Evaporative cooling is 4 to 7 times more economical than conventional systems, and at a lower investment.

In addition, evaporative cooling involves supplying 100% fresh air and thereby maintains air quality. In effect, it's an enhancement of an input ventilation facility, which means that it can be used throughout spring and summer with the cooling function only being operated when conditions dictate. Heat is normally removed at high level via natural ventilators, providing a pleasant temperature at the working area. Coolstream is well suited for retrofit into existing ventilation systems, including large spaces in which a pure ventilation system cannot ensure a comfortable internal working climate. Coolstream is well

suitable to industries such as plastics, metal, or food, and for installation in warehouses, restaurants and shopping centres, or leisure and exhibition centres. Colt can advise on all aspects of the ventilation design.

Being environmentally safe, with low installation and very low running costs, Coolstream is a reliable and green system with proven, non-complex technology.



Snel BV in Holland has equipped its 4,800 m² production hall with a Colt integrated scheme for heating, cooling and ventilation, enabling its 100 employees to have a more pleasant working climate. This scheme also ensures excellent humidity control, which is necessary for the processing of paper and cardboard.

Colt took an integrated approach to reduce energy consumption. In winter heat is reclaimed from the machines and brought down to working level, and in summer a natural extract ventilation scheme complements the Coolstream system. These ventilators also provide release of smoke should a fire break out.



HOW DOES COOLSTREAM WORK?

Evaporative Cooling involves drawing hot dry air across wetted media, which results in an exchange of energy and a significant reduction in the temperature of the air.

A revolving axial fan draws the external air through the desorption medium. This medium is simultaneously wetted with water and the air is separated from the water. This cooler fresh air, which can also be combined with natural or powered ventilators to remove excessive heat at high levels, provides a pleasant internal working environment for the occupants.

Coolstream is manufactured in two versions, with two nominal supply air flows of either 2.77 m³/s (10,000m³/h) or 4.44 m³/s (16,000m³/h), each available with a 230V AC fan (variable speed) or 400 V AC fan (two speed).

Quiet axial fan



SAFE AND ECO-FRIENDLY

The Coolstream is designed to ensure that water circulates safely and importantly, at the correct temperature. Water is systematically refreshed to avoid the growth of unwanted bacteria. No CFC or other similar refrigerants are required for this cooling process.

Aluminium fins protect the medium from direct sunlight and the unique 'Z' shape configuration prevents light entering the unit. This guarantees an optimum water quality since the unit remains in complete darkness inside keeping the process water clean and cool.

In addition, there is an "All Seasons" option providing ventilation, recirculation (heat recovery) and cooling throughout the year.

Control for max. 16 units

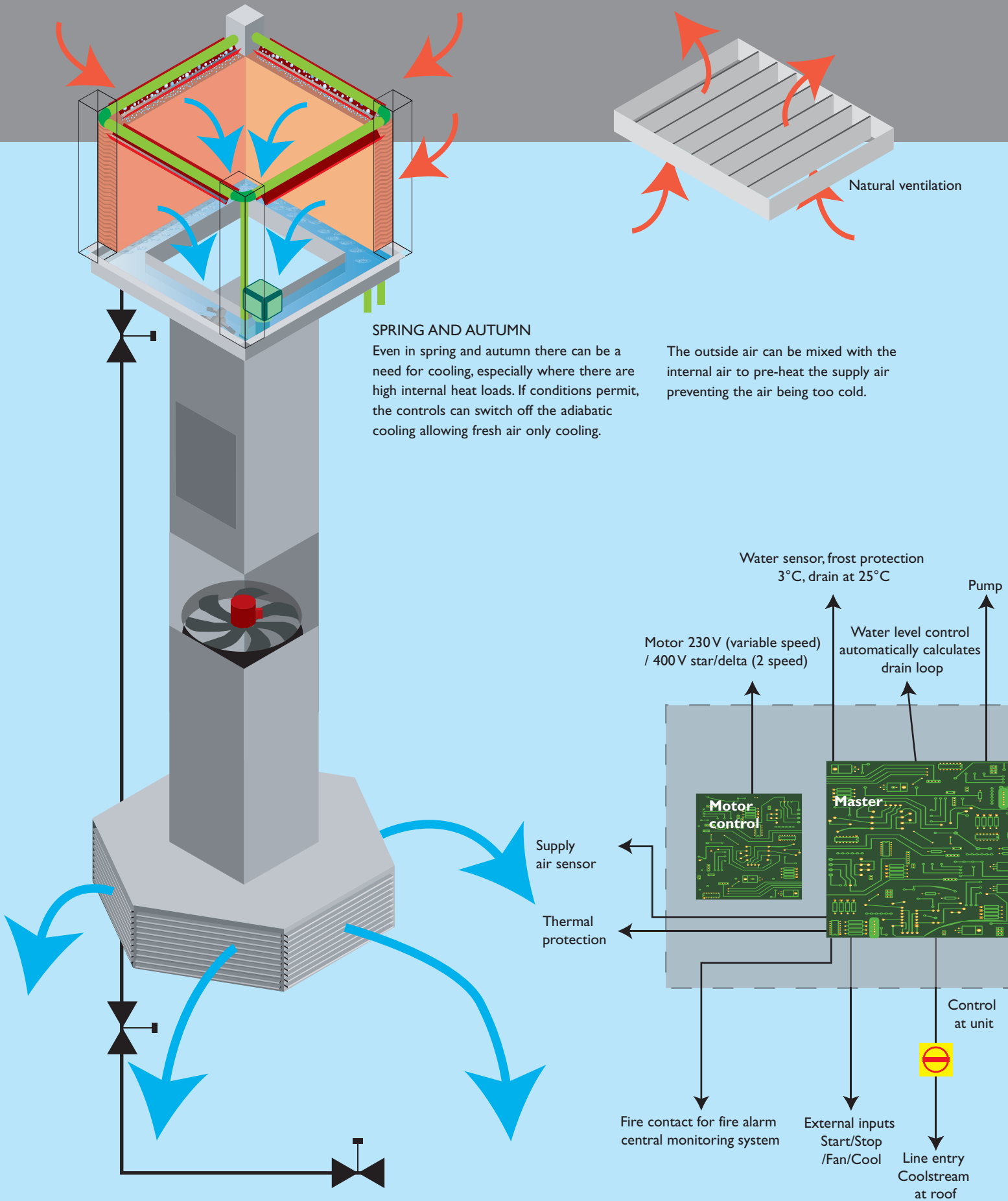


FEATURES AND BENEFITS

- Corrosion resistant aluminium housing with double-layer polyester and epoxy coating of drip tray
- Highly durable desorption medium with large surface area and low resistance to air flow thus efficient in heat transfer
- Integrated water quality system. Safe circulation, temperature and renewal of water to avoid the growth of bacteria. Coolstream has been extensively tested and certified hygienically in accordance with VDI 6022 and EN 13779 ("Ventilation for non-residential buildings. Performance requirements for ventilation and room-conditioning systems"). This is a rigorous standard for air conditioning systems and attests to the high quality of supply air. See certificate on the opposite page.
- High performance of adiabatic cooling, with up to 90% efficiency
- Only uses 100% outside air, so no stuffy internal air is recirculated
- Low cost of operation and maintenance, with a power consumption of only about 1kW per hour and 0.055 m³/h water per hour when providing 2.77 m³/s (10,000m³/h) of supply air
- Two speed or variable speed options
- Digital control with master/slave operation potential to be linked with a Building Management System (via Modbus)
- Quiet operation.

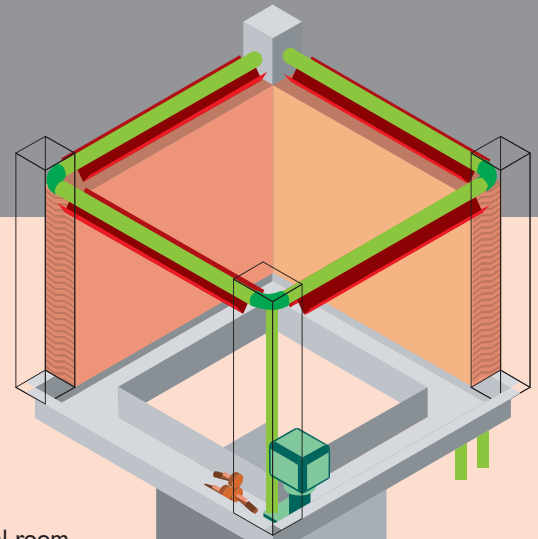
Coolstream "All Seasons"

This special design of Coolstream is designed for all-season operation. An electronic control, embedded in the roof component, provides fully automatic control during the course of the whole year.





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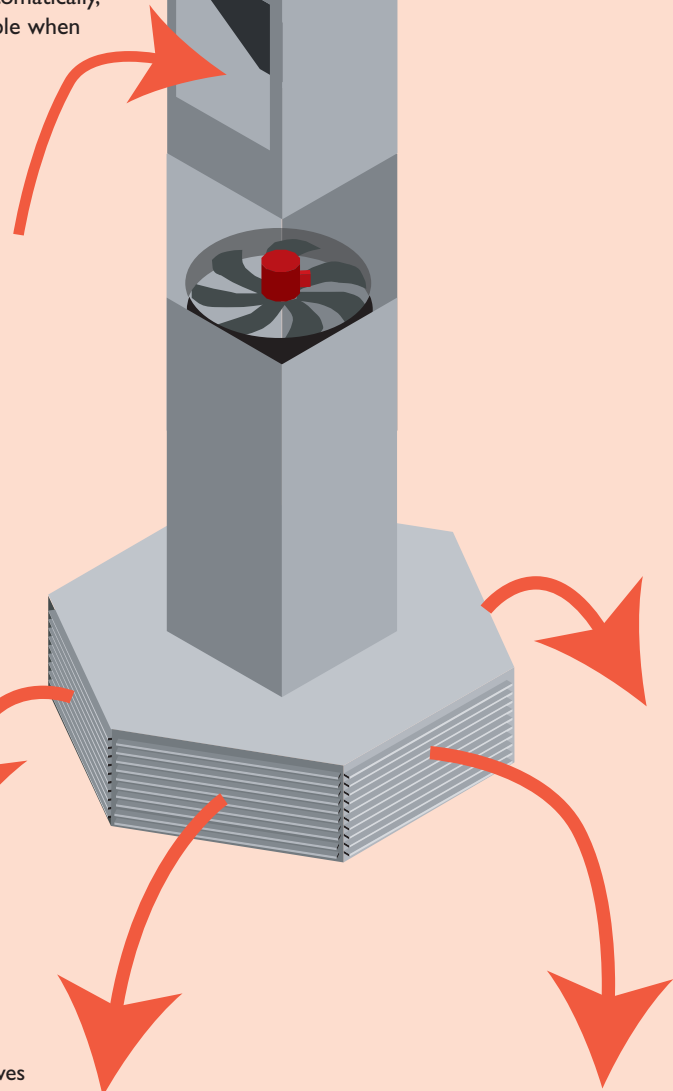
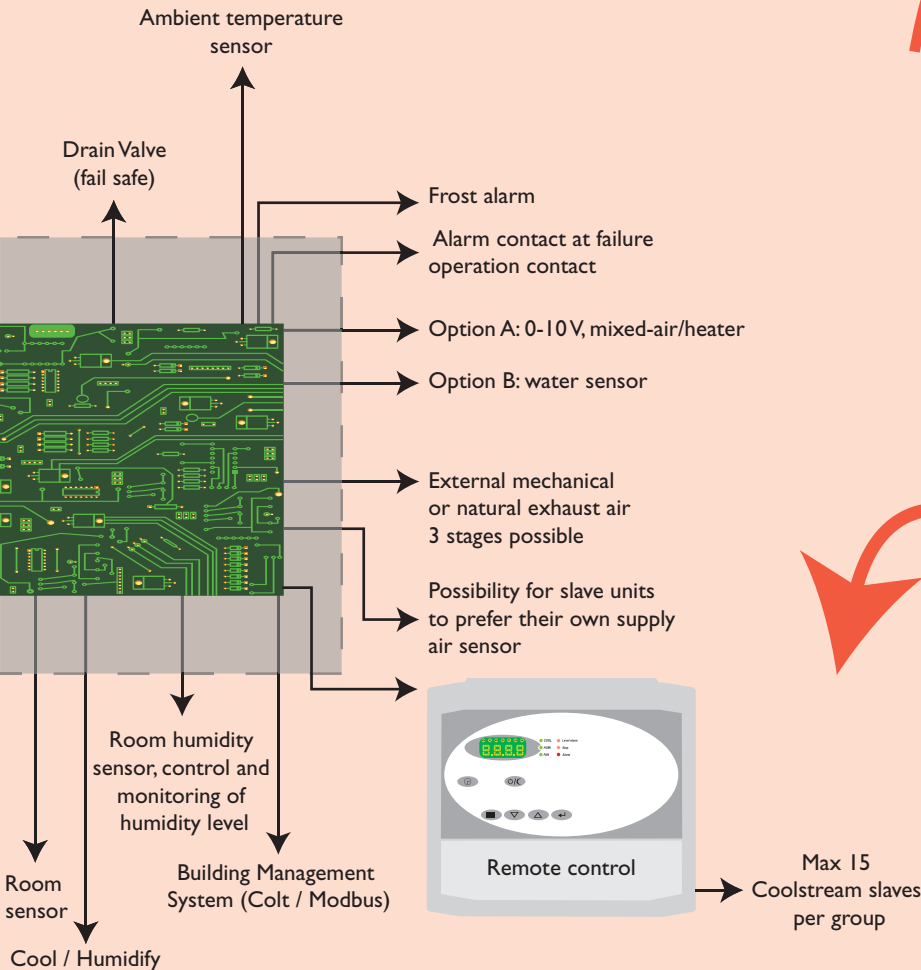


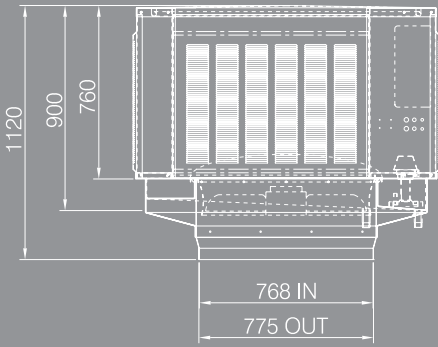
WINTER

During the winter months it is possible to use a combination of internal and outside air. If no residual heat is available, an optional recirculation function switches to 100% inside air and brings the heat at high level down to the working area.

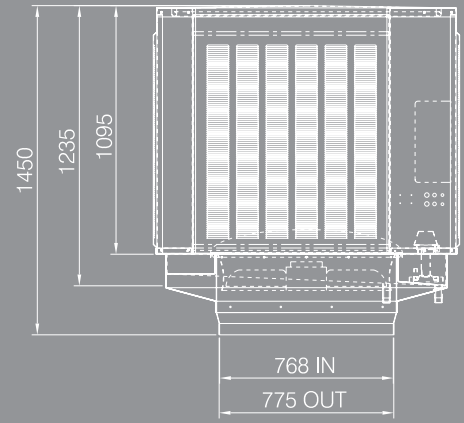
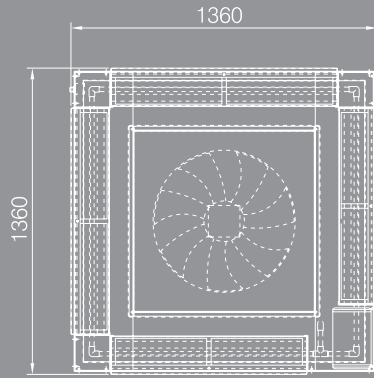
CONTROL

Every unit can be fitted with a local room sensor so that the zone temperature can be adjusted locally. The central remote control manages the entire installation. The unit functions completely automatically, but manual override is also possible when desired.

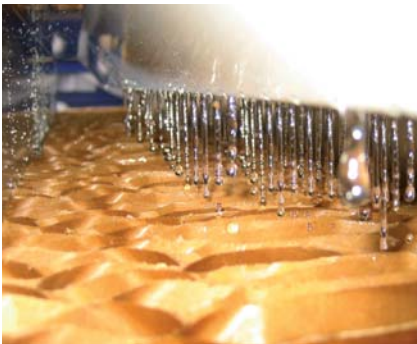




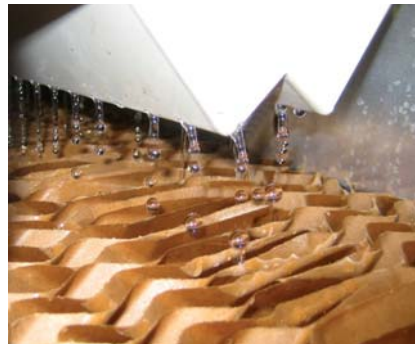
Coolstream 10



Coolstream 16



External air is mechanically drawn into the unit which is then brought into contact with the water in the wetted medium. The air is then separated from the water providing a dramatically reduced air temperature.



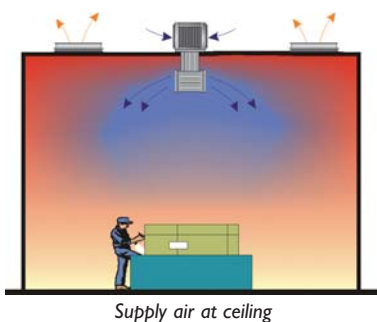
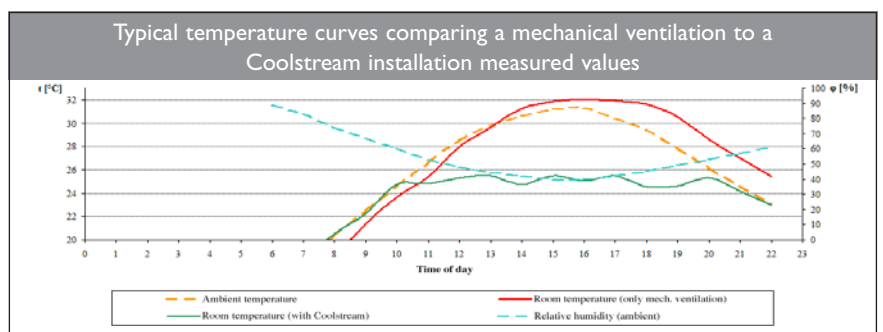
Ultra-modern design utilising twin water distribution channels provides the perfect displacement of water.



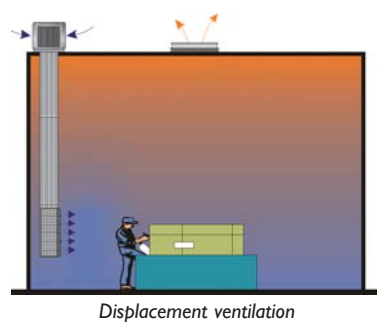
The jagged shape of the desorption medium prevents light ingress and inhibits algae growth, and aluminium fins prevent the incidence of sunlight.

SYSTEM DESIGN

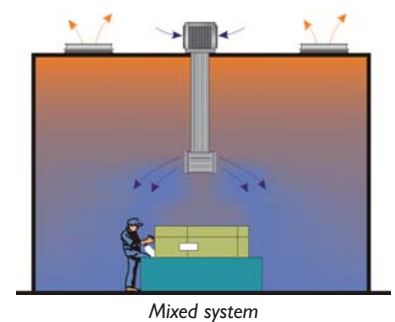
Whether yours is a new or an existing building, Colt have the capability to design and install a unique solution. This can include our detailing the system costs and water usage per day over the whole year. Colt can also compare the Coolstream option against other traditional air conditioning systems providing you with an energy usage and cost comparison.



Supply air at ceiling



Displacement ventilation



Mixed system

Technical Data for Coolstream	Size 10		Size 16	
	Motor A	Motor B	Motor B	Motor C
Fan	delta / star	30-100% variable	30-100% variable	delta / star
Air volume at 75/50 Pa stat external (m ³ /s)	3.13 / 2.36	3.20	3.33	5.64 / 0.43
Cooling capacity @ 32°C 40% RH (kW)	33 / 25	34	35	59 / 45
RPM	900 / 690	310 ~ 890	310 ~ 890	1300 / 990
Type	Ziehl-Abegg direct drive 710mm diameter axial fan			
Supply (V / ph / Hz)	400 / 3 / 50 + N	230 / 1 / 50	230 / 1 / 50	400 / 3 / 50 + N
Motor output (kW)	0.9 / 0.68	0.89	0.89	2.6 / 1.7
Motor current (A)	1.7 / 1.1	4.1	4.1	4.8 / 2.9
Motor protection	IP 54 Class F			
Thermal protection	internal, manual reset by controller			
External fuse essential (for 1.5mm cables)	10A slow blow			

Pump	
Circulation pump	1/ 30 HP – 2-pole centrifugal non corrosive
Motor power (W)	90
Motor current (A)	0.56
Water capacity at 1.1m lift	30 litres/min
Thermal protection	Internal, automatic reset
Filter type and surface	1.5 mm stainless mesh filter 500 cm ²

Cooling System	Model 10	Model 16
High efficiency desorption medium	70/90 darkening cooling pad 150mm thick	
Pressure drop at nominal speed	15 Pascal	
Evaporative max adiabatic efficiency	89 - 90%	
Average airspeed through medium	1.1 m/s	
Desorption medium front surface	2.53 m ²	3.8 m ²

Sound	10 A	10 B	16 B	16 C
Sound power level (dB(A))	76/72	81	81	90/83
Sound pressure level @ 10m (dB(A))	48/44	53	53	62/55

Weight (kg)	Model 10	Model 16
Weight without supports/base (inc fan)	45 (75)	55 (85)
Weight fully operational (inc water)	115	125
Weight for mounting base or supports	12	

Water	
Water reservoir tray	< 6 % sloped epoxy polyester coated aluminium
Water content min operation	12 L
Water content max operation	30 L
Water content for overflow	42 L
Water drain pipe and drain valve	DN 25 / 1 " (min. 0.5 L/s flow)
Water overflow connection	1 "
Supply water valve	220-240 V / 5 Watt (min. 0.15 L/s flow)
Water inlet	3/4 " male outer valve, 1 ~ 6 bar water pressure
Water distribution	Double rows 215 x 3.3 holes – W distributors
Water transport	Multi layer poly butylene 22mm - full removable joints

Dimensions (mm)	Model 10	Model 16
Height	1125	1450
Width	1360	1360
Depth	1360	1360

Outlet	
Duct connection (inner)	768 x 768 mm

Outlet Temperature °C						
Relative Humidity	30%	40%	50%	60%	70%	
Temperature °C	20	13	14	15	16	17
	24	16	17	19	20	21
	28	19	20	22	24	25
	32	22	24	26	27	28
	36	25	27	29	31	32
	40	28	30	32	34	

Cooling Capacity kW						
Relative Humidity	30%	40%	50%	60%	70%	
Temperature °C	20	25	20	15	12	9
	24	27	22	17	13	10
	28	30	24	19	14	11
	32	33	27	21	16	12
	36	35	29	23	17	12
	40	38	31	24	18	

This data assumes a 80% relative humidity and an air volume of 2.77m³/s (10,000 m³/h).
The specification for the "All Seasons" model is available on request.

THE COLT PACKAGE

Colt Climate Control offers 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.
- 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 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 and air conditioning systems.

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

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