



Energy Efficient Direct Adiabatic Cooling Solutions

General Sales Manual

Contents

Introduction and Comparisons	03	Fixed Installations - Attemperation	14
How Evaporative Cooling Works	04	Fixed Installations - Evaporative Cooling	15
Performance and Weather Data	05	Installations Options - Filtration	16/17
Installations - Evaporative Cooling		CREC Control	18/19
With Mechanical Ventilations	06/07	Additional Products and Spares	20/21
Installations - Evaporative Cooling		Energy Savings	22
With Attemperation	08	Free Cooling in the UK	23
Installations - Ventilation Systems	09		
Introduction to Products	10/11		
Internal Products	12		
External Products	13		

Evaporative cooling is a completely natural way of producing cool fresh air

Comparison with A/C Systems

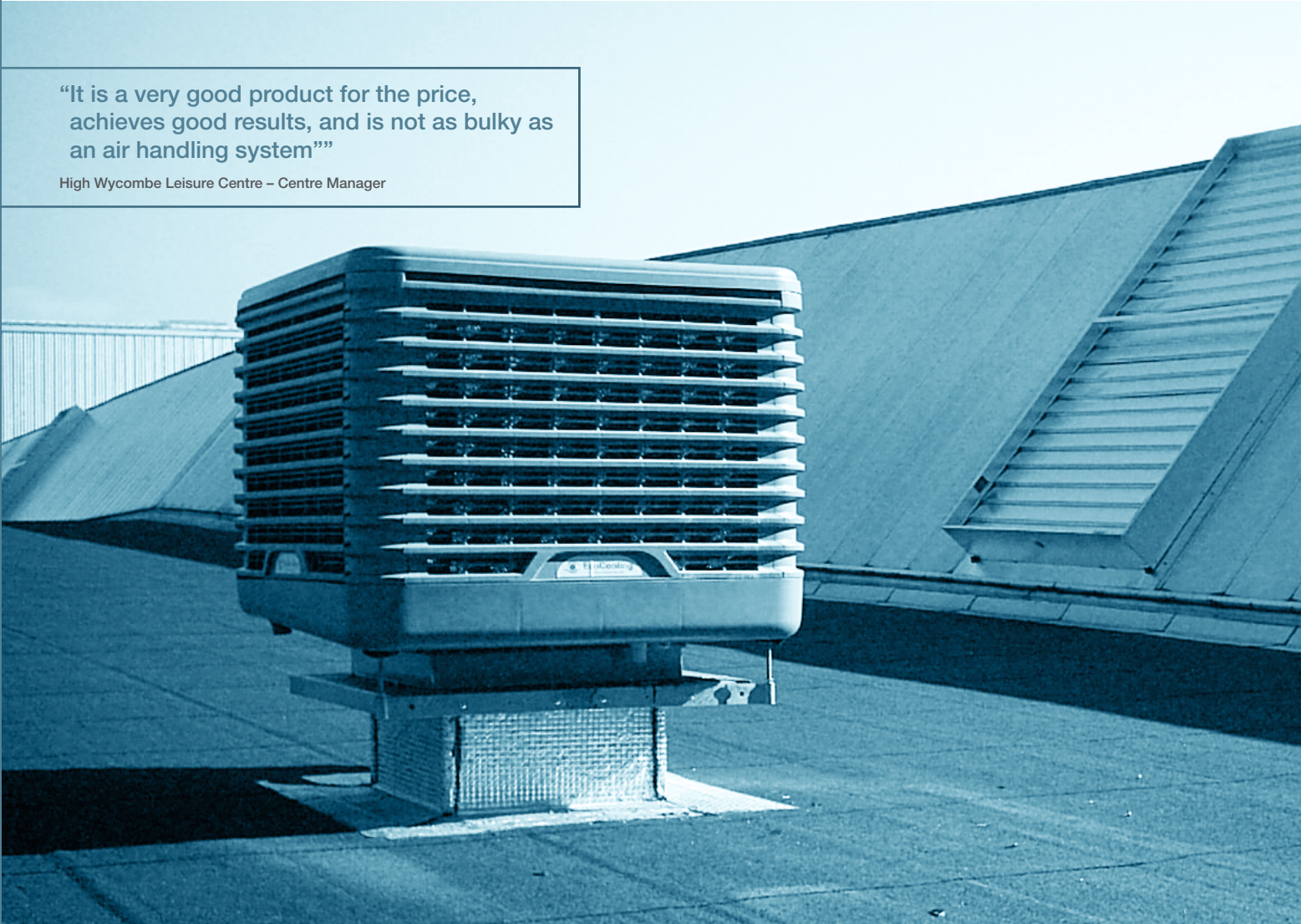
Many modern buildings require cooling either for the comfort of the occupants or to protect the processes/ equipment they contain.

There are three typical methods which can be employed to cool these buildings; ventilation, evaporative cooling or a refrigeration based air conditioning system. The choice of system can have a dramatic effect on the total carbon emissions of the buildings.

Evaporative and Ventilation	Refrigerated Air Conditioning
Typically uses less than 10% of the electricity than conventional air conditioning	High electrical use due to refrigerant circuit compressor
No refrigerants	Uses environmentally damaging refrigerants
Supplies 100% fresh cooled air	Uses mainly recycled air
Low carbon dioxide footprint	High carbon dioxide impact
Simple engineering	Complex engineering
Low purchase cost	High capital and operational cost
Can accommodate the very hottest days	Performance reduces at high ambient temperatures
Low maintenance costs	High maintenance costs

“It is a very good product for the price, achieves good results, and is not as bulky as an air handling system””

High Wycombe Leisure Centre – Centre Manager



Save up to 90% on cooling costs with EcoCooling coolers and control systems

Evaporative Cooling

Introduction and Basic Principles

EcoCooling systems use mechanical ventilation coupled with evaporative cooling to deliver cool, fresh air which can provide complete building coverage or spot cooling. Sophisticated process controls together with naturally low water operating temperatures ensure a hygienic and legionella safe cooling unit. EcoCooling units are designed and built to ensure the cooling process is both safe and economical.

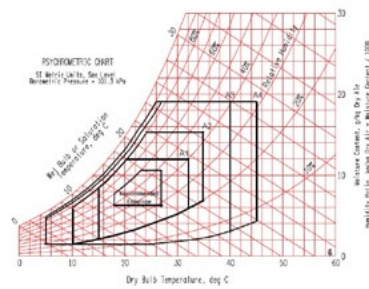
Ventilation and Evaporative Cooling

Ventilation systems alone can provide comfort cooling for most of the year in the UK. However, on hotter days they are unable to maintain internal temperatures below 25°C. It is at this point that additional cooling is required.

Using evaporative cooling as an integral part of a balanced ventilation system means that the temperature of a building can be controlled even on the very hottest days.

Principles of Evaporative Cooling

Evaporative cooling works by employing water's large enthalpy of evaporation. The temperature of dry air can be dropped significantly through the phase transition of liquid water to water vapour.



Cooling Performance

The performance of an EcoCooler is dependent upon the temperature of the air and its relative humidity (RH). The hotter the outside temperature and

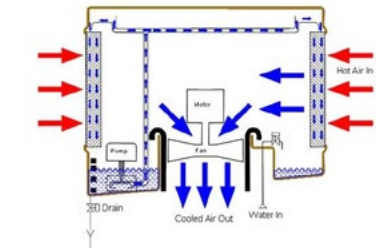
the lower the humidity, the greater the cooling effect. (See table)

	Relative Humidity			
Temp	20%	40%	60%	80%
20°C	10.2	13.1	15.6	17.9
25°C	13.7	17.0	20.0	22.6
30°C	17.0	21.0	24.4	n/a
35°C	20.4	25.1	n/a	n/a

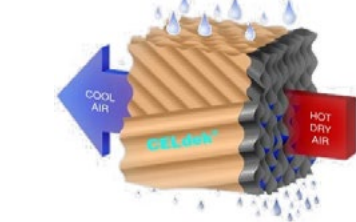
The temperature profile for the UK shows we do not experience hot and humid conditions, therefore on the hottest day up to 15°C of cooling can be achieved through the evaporative cooling process. This temperature profile is the same for most of Europe and other temperate climates. The air off temperature of an EcoCooler in the UK is always below 24°C, thus providing excellent comfort cooling for most building requirements.

Mechanics of an EcoCooler

Water is brought into the cooler from the mains water supply and is pumped up to the top of the unit using a circulation pump.



The water is then dispersed over the Munters Celdek® pads using a water distribution system which provides a continuous flow of water over the pads. As the pads become saturated, air is drawn through and the water evaporates causing the air to cool.



The cool air is then ducted round the building to provide cooling by means of an axial fan.



Humidity

With an evaporative cooler you are basically turning a hot summer day into a warm spring day. If the building does not suffer from humidity problems in April. Humidistats can be fitted if humidity is critical and dynamic temperature control can be used in IT environments to reduce high humidity.

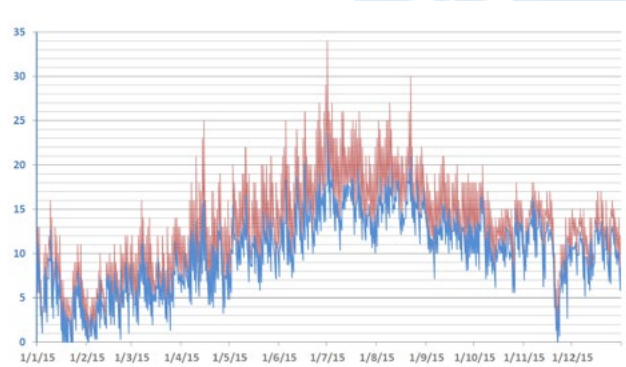
Performance data for UK

Temperatures that can be achieved

The maximum amount of cooling achievable with EcoCooling systems cities in the British Isles is shown in the graphs below. Performance data is based on daily temperature data taken at each location, the data is supplied by a third party. We can provide expected performance data for cities globally.

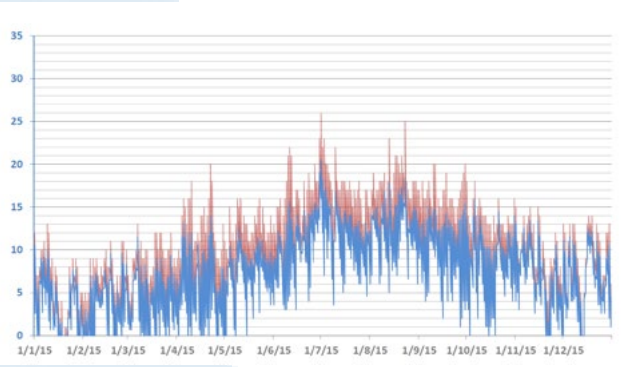
Red line - Ambient Blue line - Cooled temperature

South East England - London



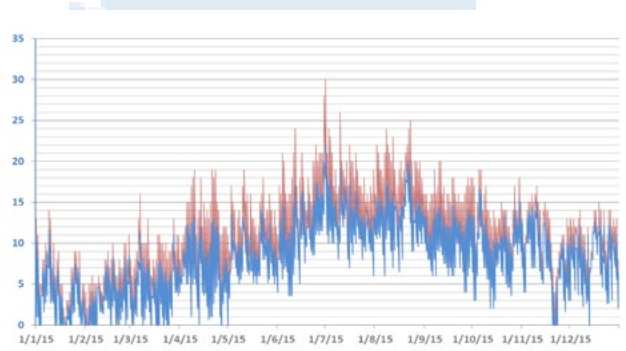
Maximum ambient temp: 30°C Max cooled temp: 20°C

Scotland - Glasgow



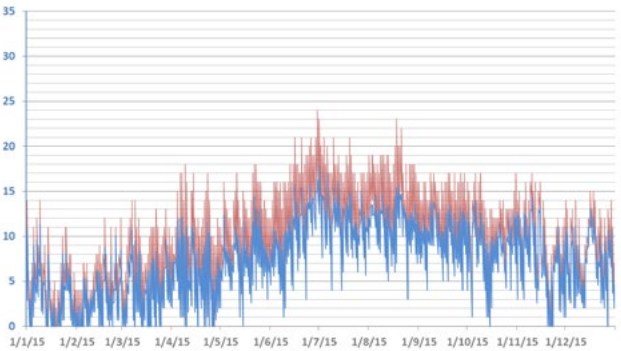
Maximum ambient temp: 25°C Max cooled temp: 20°C

North England - Manchester



Maximum ambient temp: 25°C Max cooled temp: 19°C

Ireland - Dublin



Maximum ambient temp: 21°C Max cooled temp: 18°C

Have we missed your city? No problem, drop us an email to sales@ecocooling.org with your location and we can send you back the relevant performance data!

EcoCooling has over 3000 costs with EcoCooling coolers and control systems

EcoCooling Systems

Flexible Products and Installation Types

Installation Types

Evaporative Cooling with Mechanical Ventilation

EcoCoolers are used as part of a mechanical ventilation system to provide a cost effective alternative to refrigeration for large buildings. Standard evaporative coolers have a supply air temperature dependent upon the ambient temperature and humidity. On cool days this is the ambient (dry bulb temperature) and on hot days, when evaporative cooling is enabled, this is close to the 'wet bulb' temperature.

How Systems Work: General Principals

Step 1: Fresh air is brought into the system through EU4 pre-filters and Munters CELdek® pads.

Step 2: Evaporative cooling operates during warm periods to cool external air.

Step 3: An extract fan is specified to match the integral supply fan

Step 4: Control systems automatically match air flow to the amount of cooling required.

Use in Industrial and Commercial Environments:

To calculate how many coolers are required for an installation, the air change method can be used. The volume of the building is calculated and multiplied by a scaling factor dependent on the application, this gives the hourly flow rate required. Different air changes per hour are required for different applications.

Offices and shops: 8-10

Light manufacturing: 10-15

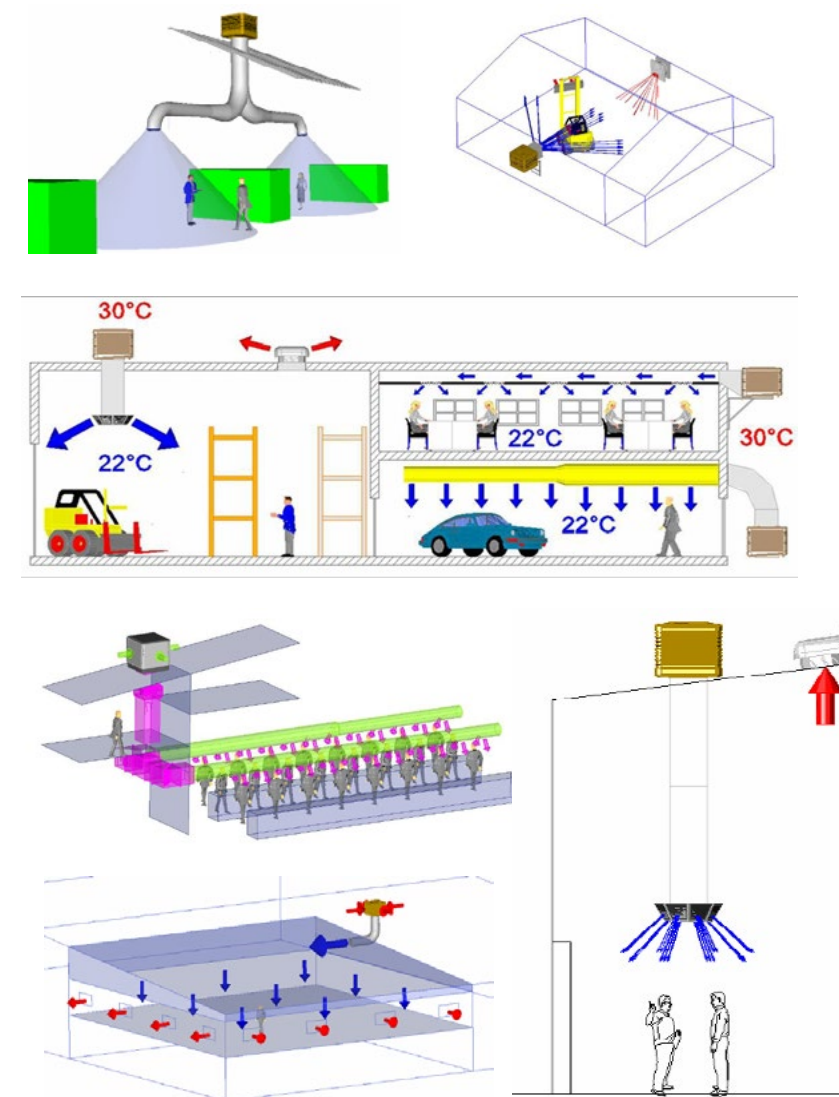
Normal manufacturing: 15-20

Heavy manufacturing: 20-30

Extreme conditions: 30-40

Choosing a Product:

Contact us directly for a quote or to arrange for an approved installer to visit your site.



Product	Nominal Flow Rate (m³/hr)	Cooled Area Diameter (m)		
		10	20	30
ECP- T/D	12,600	38	9	4
ECP- S	9,600	28	7	3
ECPL - T/D	18,000	48	12	5
ECPL - S	12,000	36	9	4

End user applications this system include:

Warehouses | Manufacturing Facilities | Mezzanine Floors | Production Lines | Bakeries | Laundries | Food Processing | Churches | Lecture Theatres |

"We are extremely happy with the performance of our EcoCoolers, the system consumes 87% less power than the previous DX system"

Mark Jacob's - Facilities Manager - Talk Talk

Installation Types

Evaporative Cooling with Attemperation

Using a standard system can result in supply air temperature can vary during the day and throughout the year. This can cause issues in some applications such as IT cooling where either temperature variation or low temperatures are not acceptable.

To avoid these issues EcoCoolers can be incorporated into a system which uses attemperation. The hot air from the extract is mixed with the incoming cool air to provide a controlled temperature flow. A PLC (Programmable logical controller) set the position of dampers to maintain a temperature set point. It also varies the fan speed to minimise energy use. Water use is optimised by evaporative cooling only being enabled when pure ventilation cannot maintain the desired temperature.

How Systems Work: General Principals

Step 1: Fresh air is brought into the system through EU4 pre-filters and Munters CELdek® pads.

Step 2: Evaporative cooling operates during warm periods to cool external air to the supply set point.

Step 3: During winter periods warm exhaust air is mixed with cold fresh air. EcoCooling describe this mixing process as attemperation.

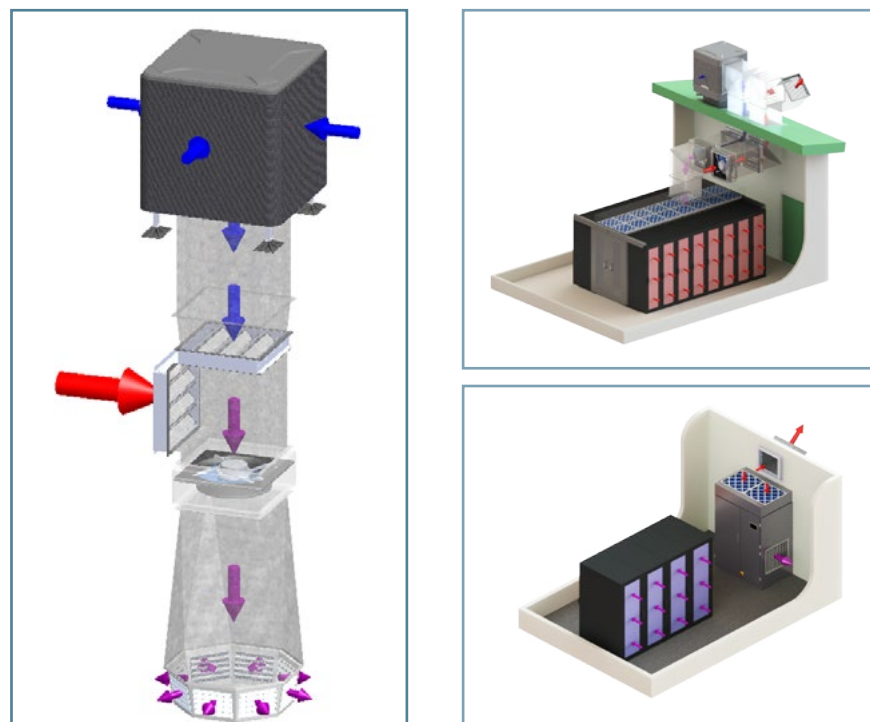
Step 4: Low energy variable speed EC (Electronically Commutated) fans are specified to supply and extract air.

Step 5: Patented control systems measure and control air flow rate, supply and exhaust temperature.

Step 6: Control systems automatically match air flow to the amount of cooling required. **A CREC control system is required for this system.**

Use in Data Centres:

See the table to the right for our full range of products and associated cooling capacities over different ΔT .



Product	Nominal Flow Rate (m³/hr)	Cooling Capacity (kW)		
		$\Delta T=5^{\circ}\text{C}$ (comms)	$\Delta T=10^{\circ}\text{C}$ (servers)	$\Delta T=15^{\circ}\text{C}$ (blades)
ECT5400	5,400	10	19	29
ECT10800	10,800	19	38	58
ECP- D/T	12,600	22	45	67
ECP- S	9,600	17	34	50
ECPL- D/T	18,000	38	64	96
ECPL- S	13,500	29	48	72

End user applications this system include:

Data Centres | IT | Comms | Schools and Classrooms | Lecture Theatres | Gyms and Fitness Suites | Restaurants | Venues | Theatres | Offices | Greenhouses |

Installation Types

Fresh Air Ventilation Systems

The ECV range of units consist of a mechanical ventilation unit with attemperation. There is no cooling facility. This product has been designed for buildings where temperatures above 25°C are not considered to be of significant importance or in rooms where free cooling can be used to supplement refrigeration equipment. There is on average 300 days a year in the UK where free cooling can be used to replace refrigeration..

How Systems Work: General Principals

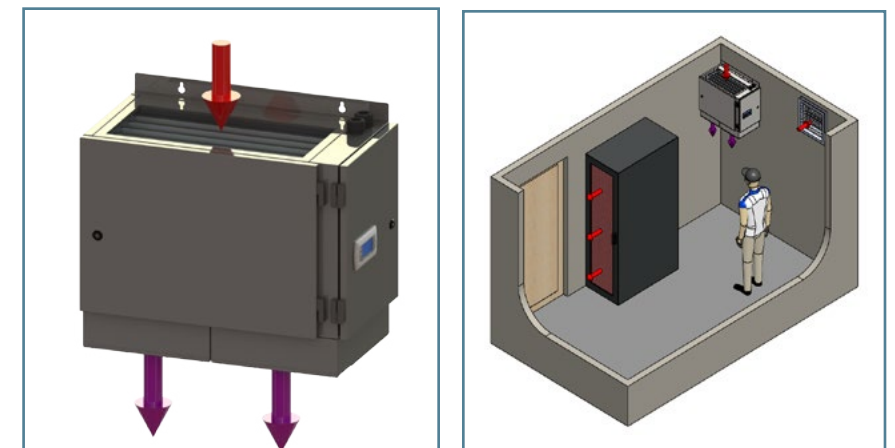
Step 1: Fresh air is brought into the system through EU4 pre-filters.

Step 2: During winter periods warm exhaust air is mixed with cold fresh air. EcoCooling describe this mixing process as attemperation.

Step 3: Low energy variable speed EC (Electronically Commutated) fans are specified to supply and extract air.

Step 4: Patented control systems measure and control air flow rate, supply and exhaust temperature.

Step 5: Control systems automatically match air flow to the amount of cooling required.



Product	Nominal Flow Rate (m³/hr)	Cooling Capacity (kW)		
		$\Delta T=5^{\circ}\text{C}$ (comms)	$\Delta T=10^{\circ}\text{C}$ (servers)	$\Delta T=15^{\circ}\text{C}$ (blades)
ECV 220	2,200	4	7	11

Modular cooling systems allow end users more design flexibility

ECP and ECT Ranges

3500 Installations Worldwide



“I am so impressed with the evap system. We had a demo of it working at full blast and you could not hear a thing, it was so quiet“

Jo Dearham, Bristol City Council

EcoCooling Product Ranges

EcoCooling's expansive product range and configuration options allow installers and end users to create bespoke cooling systems from modular components. The cooling units have been designed with features to increase installation compatibility while reducing operational and capital costs.



Internal Product Range (ECT): Compact and Flexible Solutions

The ECT range of coolers are designed to be installed internally. Designed originally for IT applications. Multiple configuration options allow for air to be supplied either directly, through ductwork or raised floors. There are over 500 internal installations in the UK.

Single box solution, dampers, supply fan and control system all incorporated into the EcoCooler design.

Worried about getting the cooler into your room? The ECT5400 will fit through a single door.

For complete peace of mind a sophisticated leak detection and alarm system has been incorporated into all of our internal products.

Humidification: ECT units can be fitted with a humidification option to remove low relative humidity non-compliance. These are fitted as standard to the Nordic grade cooler.

Efficiency: All ECT units are supplied with EC fans which are at the forefront of fan technology.

External Product Range (ECP): Proven Technology and Results

The ECP range of coolers can be installed externally or inside a plant room. They are the cooler of choice in most industrial installations. The large number of configuration options mean more installations are achievable than would be with competitive products. There are over 3500 ECP installations worldwide.

Advanced water controls minimise risk of legionella formation.

Attemperation: ECP units can be fitted as part of a CREC system with recirculation for close control of temperatures in an air handling system.

Flexible installation options: Available as both a cooler (inbuilt fan) or a wetbox in top, side and down discharge configurations.


Compact modular design: Units fit on a standard pallet for shipping and can be stacked for installations where there is limited external space.


EcoCooling offer
one of the largest ranges of coolers available

Internal Product Range

ECT Specifications

The ECT range of coolers combine a ventilation system, cooling, recirculation, filtration and controls into a single box solution, this significantly reduces installation costs. ECT units are not suitable for external use.

	Characteristic/Feature	Value/Detail
	Power Supply	3~400V 50 Hz
	Cooling Capacity in Adiabatic Mode	35kW (ΔT of 8°C)
	Design Flow Rate	10,800m³/hr
	Weight	392kg
	Dimensions (h x d x w)	2575 x 860 x 1300mm
	Design Power Usage (60% fan speed):	
	Cooling Mode	0.9kW
	Ventilation Mode	0.9kW
	Fresh Air Intake Size (h x w)	1200 x 400mm
	Recirculation Air Intake Size	700 x 700mm

	Characteristic/Feature	Value/Detail
	Power Supply	1~ 230V 50Hz 13A
	Cooling Capacity in Adiabatic Mode	15kW (ΔT of 8°C)
	Design Supply Flow Rate	5400m³/hr .
	Weight	<300kg
	Dimensions (h x d x w)	1800 x 820 x 1220mm
	With Recirculation Filter Module	2050 x 820 x 1220mm
	With Supply Filter Plinth	2200 x 820 x 1228mm
	Design Power Usage:	
	Cooling Mode	0.28kW
	Ventilation Mode	0.21kW
	Recirculation Intake Size (h x w)	600 x 300mm
	Fresh Air Intake Size (h x w)	600 x 300mm

Component Specifications


Cooling Pads: Munters CelDek® pads in the side of the unit are used to cool incoming air.

Control System: The unit is controlled via a touch screen user interface.

Efficient Fan: Use of EC fans results in significantly quieter and more energy efficient operation.

EU4 Filtration: The airflow can be subject to EU4 filtration both at the fresh air intake and at the point of supply.


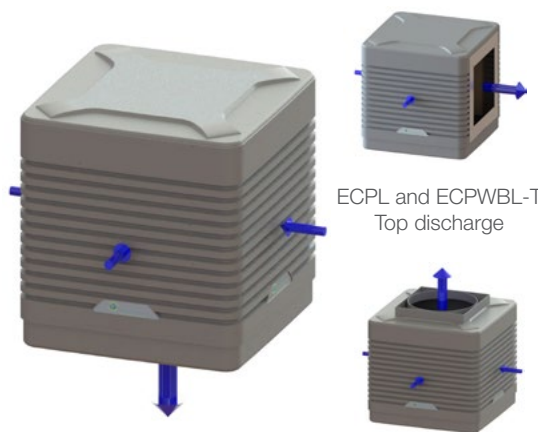
ECM Mobile Specification

	Characteristic/Feature	Value/Detail
	Electrical Supply	1~ 230V 50 Hz
	Current (Start/Running)	6A/1.7A
	Design Flow Rate	7000m³/hr
	Weight (Dry Sump)	78kg
	Dimensions (h x d x w)	1109 x 1142 x 748mm
	Design Power Usage:	
	Start	1.4kW
	Running	0.4kW


ECP External Product Range

Specifications

There are over 3000 ECP installations worldwide. The standard cooler option with in-built fan is usually the best option for industrial installations, where a simple, economical system is required. Wetboxes don't contain a fan and should be used as part of a mechanical ventilation system.

ECP/ECPWB - EcoCooler		Characteristic/Feature	Value/Detail
<div>ECP and ECPWB Down discharge configuration</div>  <div>ECP and ECPWB - S Side discharge</div> <div>ECP and ECPWB-T Top discharge</div>	Power Supply ECP ECPWB	1 ~ 230V 50Hz 8A 1 ~ 230V 50Hz 0.25A	
	Design Supply Flow Rate ECP/WB - T & ECP/WB ECP/WB - S	12,600m³/hr 9,450m³/hr	
	Weight ECP ECPWB	125Kg 95Kg	
	Dimensions (h x d x w) ECP/WB ECP/WB - T ECP/WB - S	1800 x 820 x 1220mm 2050 x 820 x 1220mm 2200 x 820 x 1228mm	
	Cooling Pad Area ECP/WB - T & ECP/WB ECP/WB - S	2.3m² 1.7m²	
	Standard Control System Standard Fan (cooler option only)	EcoCooling 5-speed	
	ECPL-ECPWBL - EcoCooler Large		Characteristic/Feature
<div>ECPL and ECPWBL Down discharge configuration</div>  <div>ECPL and ECPWBL-S Side discharge</div> <div>ECPL and ECPWBL-T Top discharge</div>	Power Supply Cooler Wetbox	3~ 400V 50Hz 8A 1 ~ 230V 50Hz 0.25A	
	Design Supply Flow Rate Top and Down discharge Side discharge	18,000m³/hr 13,50m³/hr	
	Weight Wetbox	115Kg	
	Dimensions (h x d x w) ECPL/WBL ECPL/WBL - T ECPL/WB - S	1306 x 1250 x 1250mm 1406 x 1250 x 1250 mm 1306 x 1250 x 1250mm	
	Cooling pad area ECPL/WBL - T & ECPL/WBL ECPL/WBL - S	3.3m² 2.5m²	
	Standard Control System Standard Fan (cooler option only)	EcoCooling 2-speed EC 630mm	

FC220 Ventilation Product Specification

	Characteristic/Feature	Value/Detail
	Electrical Supply	230V/50 Hz
	Current (Running - Soft Start)	1.6A
	Design Flow Rate	2,200m³/hr
	Weight (Dry Sump)	43kg
	Dimensions (h x d x w)	602 x 725 x 400mm

Installation Examples with Attenuation Data Centres and Comms Rooms

Choosing the right EcoCooler configuration for your installation is essential to its success. The ECT and ECP units are designed to be as flexible as possible. For attenuation ECP wetboxes are usually used as part of an air handling arrangement for systems requiring attenuation. ECP units can also be stacked for installations with limited outdoor space. ECT units incorporate a single box air handling solution but do require an additional extract fan to drive the exhaust air out of the building.



Installation Examples - No Attenuation Industrial and Commercial

ECP units are used as standard in industrial and commercial installations. While most of the time a down discharge cooler placed on a roof is the simplest option, there are times when alternatives are required. Top discharge coolers are ideal for clients concerned about maintaining equipment on the roofs of buildings and can be placed on the ground outside of the facility. Side discharge coolers can be used for situations where coolers need to be placed on the sides of buildings off ground level.



"We have found the EcoCooling evaporative cooling units to be the best on the market, they are the most powerful of all available and the most reliable, whilst being competitively priced"

Jim Jackson - Managing Director, Celsius Design

Guarantee air quality
compliance for all environments

Installation Types

Using Filtration in Fresh Air Systems

When fresh air is used in some environments there can be a risk of either particulate or gaseous contamination. The quality of the air in the locality of the data centre can affect the feasibility of the use of fresh air. Adequate filtration must be specified in certain environments.

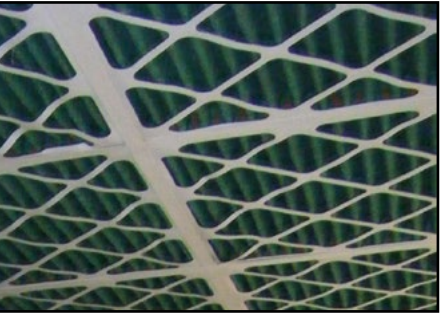
Types of Filtration

Depending on the type of installation, filtration requirements may vary. For instance it is advised to use a minimum of EU4 filtration on both the supply and attemperated air in IT environments. Additionally, in some industrial installations, for example food production, filtration up to F7 is required for the supply air. Standard filtration standard grades and properties are outlined below:

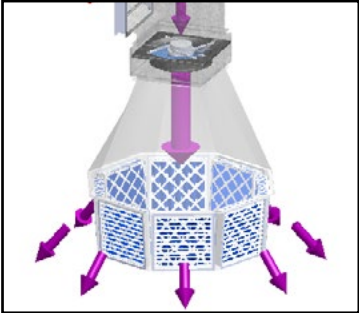
Filter	General properties	Class	Effect
Basic Filter	In general: - produced in synthetic fibres - efficient for particles > 4-5 mm - air speed < 2.5 m/s - start pressure drop approximately 50 Pa - final pressure drop approximately 150 Pa	EU1	Protects against insects and fibres. Limited effect against larger pollen (<70%) Ineffective against smoke and blacking particles.
		EU2	Effective against larger pollen (>85%) and larger atmospheric dust. Limited effect against dust and blacking particles.
		EU3	As EU2
		EU4	Limited effect against dust and blacking particles
Fine Filter	In general: - produced in glass fibres - efficient for particles > 0.1 mm - air speed < 2- 3 m/s - start pressure drop approximately 50-100 Pa - final pressure drop approximately 200 -250 Pa	EU5	Effective against pollen and finer atmospheric dust Considerable effect against smoke. No effect against tobacco smoke
		EU6	As EU5.
		EU7	Effective against pollen and blacking dust
		EU8	Very effective against particles and blacking. Very effective against microbes. Effective against tobacco.
		EU9	As EU8.

Installation Options

There are various ways of incorporating filters into the installation design. The below examples showing some possibilities for incorporating filter into different installations:



Filter panels in a ceiling in a data centre



Filter panels built into a plenum



Pre-filter jackets

“EcoCooling worked with us to develop a system for our facility in Sweden, which is one of the most efficient in the world”

Alex Chiolo, Technical Director, Hydro 66

EcoCooling ‘s wide
range of filters ensure clean air all year round

Cost effective controls
solutions optimise efficiency

Control Systems

Advanced Systems

An EcoCooling control panel is integral to the success of any installation which requires recirculation or attemperation. The standard control system is Crouzet and the program has been developed by EcoCooling in-house over the last 10 years to optimise both the energy savings and operation of the cooling system.



Versatile Communication Options: Modbus TCP/IP allows for easy communication into most major BMS systems. An inbuilt VNC server allows the HMI to be viewed remotely on most mobile phones and tablets. Assistance with converting data and SMPT logging is available on request.



Resilience: All systems can be produced with a built in 'fail-safe' and incorporate manual control and backup power options to ensure fans will continue running in the event that a control system goes down.



Redundancy: All key sensors are duplicated and refrigeration can be automatically activated as a backup if there is a fault.



Alarm Notification: The control system automatically notifies the BMS system in the event of a problem. Email and text notification can also be enabled. Direct links to fire systems are available, when activated the control system automatically closes fire dampers and switches on any backup systems.



Historical Data and Event Logging: The HMI can log and present different variables as a trend display. Chosen data can be stored on the HMI for download at a later point via USB. This data can also be emailed after a predefined fixed time interval.



Remote Commissioning: EcoCooling offer a remote commissioning service, saving time and money, particularly in foreign locations.

End user applications for this system include:

Data Centres | IT | Comms | Schools and Classrooms | Lecture Theatres | Gyms and Fitness Suites | Restaurants
| Venues | Theatres | Offices | Greenhouses |

Our new data centre in Leeds is as advanced as any in the world. Moreover, while the EcoCooling systems underscores the CCS's commitment to the environment it also means that we can significantly reduce our costs which will be passed on to our customers in the corporate sector."

Peter Knapp, MD, CCS

**Increase functionality
and monitoring capacity with a CREC touch screen**

Additional Products

General Spares and Dampers

Dampers

Effective control of the volume flow rate of the various air streams within an EcoCooling system is essential to its successful function. The range of dampers offered by EcoCooling has been specified so that they offer the required flow regulation and integrate easily into CREC controllers. Features offered include:

Tip Seal Blades – minimising air leakage between damper blades

Sealed Blade Carriers – minimising air leakage between damper blades and the damper frame

Spring Return Actuators – ensuring rapid response in case of emergency or power failure

EcoCooling are also able to provide fire rated dampers, but these should not be used alone for volume flow control in a mixing system.

The ECT range of units have integrated intake and recirculation dampers. An additional exhaust damper is recommended in general, and is required when the units are used within a system using either back up air conditioning or fire suppressant gas.

The ECP range of units require dampers to control air intake, recirculation and exhaust air flow rates when included in a system that requires attemperation.

Spare parts

EcoCoolers have very few mechanical parts compared with refrigeration technologies and are simpler to maintain.

All coolers come with a preprogrammed test sequence which will highlight faults with core components to allow for easy diagnostics.

Spares for all units are available ex-stock. A spare parts list can be requested from sales@ecocooling.org.

Colour Coating

Some installations require colour coating of units due to external building regulations or to improve the installation aesthetically.



Both the external and internal ranges can be colour coated when a RAL number is provided.

Additional Products

Filters and Fans

Filtration

When fresh air is used in a sensitive environment there can be a risk of either particulate or gaseous contamination. The quality of the air in the locality of the data centre can affect the feasibility of the use of fresh air. It is now normal to fit filtration to a minimum of EU4/G4 standards.



The ECT units have inbuilt filtration. The ECP units require filtration to be built into the ventilation system design. EcoCooling stock a variety of filters in different grades up to F7. This range has been specially selected so they are easily incorporated into our systems.

Pre-filter jackets

These fit around the outside of the external coolers, prefiltering the supply air.

Cartridge filter

These can be fitted as part of the attemperation loop to ensure recirculated air is also filtered.

Filter bags

These are used in the ECT10800 units to filter both supply and recirculated air.

Dual Filtration

Air intake filtration (pre-filter jackets) is designed to eliminate potential contamination from external air. In addition cartridge filters can be used in either ducting or as replacement ceiling tiles to filter the recirculated air.

EcoCooling Fans

The ECP60-03 EcoCooler is provided with inbuilt fans as standard.

Noise Controls: For installations where there are noise restrictions the fan can be upgraded and antivibration mounts added to the unit before dispatch.

EC Fans

All ECT units are supplied with inbuilt EC fans. They are also specified by EcoCooling for any ECP CREC systems as standard.

EC Fans are available in a variety of sizes, ex-stock.

Electronically commutated (EC) fans are driven by a micro-controller instead of a traditional AC motor. The technology provides the following advantages:

Increased speed control:

EC technology enables continuous adjustment of the fan speed to meet the cooling demands of the data centre. EcoCooling control systems are designed to take advantage of the energy savings which can be gained by reducing fan speeds.

Low power usage at partial loads:

The relationship between fan speed and power utilisation is subjected to a x^3 relationship, meaning that at half the speed the fan will be using an eighth of the electricity. Operating the EcoCooling system at half speed reduces the fan energy use by over 85%.

Plenum Options

Plenums are used as a standard solution for air distribution in industrial installations. EcoCooling stock a number of plenum which can be incorporated into system designs.

“An incredibly effective cooling system, resulting in a dramatic reduction of operational costs.”

Matthew Butt, Managing Director, Netwise Hosting

Evaporative Cooling

Energy Use of Standard Systems

An evaporative cooling installation typically consumes less than 10% of the electricity compared to the equivalent rated refrigeration based cooling system. Return on investment for industrial systems is usually between 2-5 years and can be as low as 0.5 years for environments where the cooling is required 24/7 e.g data centres. Below are some example savings calculations

Industrial Systems

Compared to a traditional refrigeration system the estimated energy savings are expected to be around 90%. A single EcoCooler, rated at 35kW, can show carbon savings of up to 10,000kg per year and cost less than 15p per hour to run.

Energy Consumption: Running costs for a single unit ECP60-03 based on an average airflow of 14,000 m³/hr are:

Utility	Usage and Cost per Hour
Electrical Consumption	£0.120
Water Consumption (average)	£0.012
Total Cost per Hour	£0.132
Total cost per 168 hour continuous working week	£22.18



Data Centre and Comms Systems

Depending on the installation and operation of CREC® systems, return on investment can be achieved in under a year. Below are operating cost calculations for some of our products. For cost calculations for your project and location please contact us directly.

Energy Consumption: Electricity at 10p/kWhr. Water £1.00/m³. London location. 24/7 usage. ΔT=10°C

Operating Costs	AC (CoP 2)	EcoCooling	Savings
1. System Design: 100kW cooling load. Product: ECP-D, ΔT=10°C			
Total Cost	£43,800	£3,386	£40.414
CO₂ Impact	235 tonnes	17 tonnes	218 tonnes
2. System Design: 35kW cooling load. Product: ECT 10800, ΔT=10°C			
Total Cost	£15,333	£828.40	£14,505
CO₂ Impact	77 tonnes	4.2 tonnes	73 tonnes
3. System Design: 15kW cooling load. Product: ECT5400, ΔT=10°C			
Total Cost	£6,573	£260.428	£6,313
CO₂ Impact	33 tonnes	1.3 tonnes	31 tonnes

Exploiting free cooling in the UK

using evaporative cooling

Free cooling is an economical method of using low external air temperatures to reduce the amount of additional cooling required. When the ambient external temperature is below the desired supply set point the cooling system can run in ventilation mode, bringing fresh cool air in from outside. On warmer days of the year, evaporative cooling is used to cool the air to the desired set point.

EcoCooling systems use direct adiabatic/evaporative cooling which exploits the full free cooling envelope.



The number of exploitable free cooling days is dependant on your location and desired supply temperature;

Cooler climates provide more free cooling potential.

Higher supply temperatures increase the available number of free cooling days.

Examples:

Location: London
Desired Supply Temp: 18°C
% time in free cooling mode: 86%

Location: Manchester
Desired Supply Temp: 18°C
% time in free cooling mode: 94%

Location: Aberdeen
Desired Supply Temp: 18°C
% time in free cooling mode: 97%



Save up to 90% on cooling costs with EcoCooling coolers and control systems

