

NEW: ECHO High Efficiency IT Cooling System

The high efficiency ECHO IT Cooling System is the perfect, future-proof solution to meet the cooling parameters of latest IT hardware, not only in terms of temperature but also airflow and pressure. This ensures the right air temperature, in the correct quantity and at the correct pressure is presented to the server inlet, enabling it to breathe efficiently. By varying the air volume, the ECHO system operates not only with air volumes 50% less than traditional cooling systems but much more efficiently and with elevated water temperatures that allow up to 95%* free-cooling (London, UK).

Complete, flexible, free-cooling solution

At the hub of the ECHO system is an ACE (Active Cabinet Exhaust) unit which sits on top of the server cabinet, drawing precisely the right amount of hot discharge air from the servers and rejecting it away into the ceiling void, without any impingement into the IT environment. The air is ducted directly to an Airedale ECHO CRAC unit which in turn is linked to one or more Airedale ECHO free-cooling chillers via interactive controls logic and intelligent software. This smart, controls logic, matched with all the latest technology direct drive EC fans and chilled water coil technology, is key to the ECHO's ability to communicate from rack to chiller and gives the ECHO system its intelligence, high efficiency and resilience.

Key benefits at a glance

- > Outstanding energy efficiency providing reduced operating costs and carbon impact
- > Variable rack load densities to a maximum of 20kW per rack
- > No chilled water/refrigerant connections at the rack or in the IT space
- > The Airedale ECHO CRAC unit does not overcool as airflow demand is communicated via the ACE and the rack demand
- > Control is led from rack level, rescheduling the Airedale ECHO CRAC and free-cooling chiller to optimise performance
- > The use of thermal inertia in the room in the event of ACE failure means no rapid overheating
- > Higher density cabinets can be designated as the technical space is populated, rather than at day one
- > The entire technical space is at the server inlet temperature, thus avoiding hot spots and providing a buffer of cool air in the event of failure
- > With no hot/cold aisle configuration, the technical space available for IT equipment is increased

Example ECHO application: PUE 1.2*



ACE



Airedale ECHO CRAC unit



Airedale ECHO free-cooling chiller



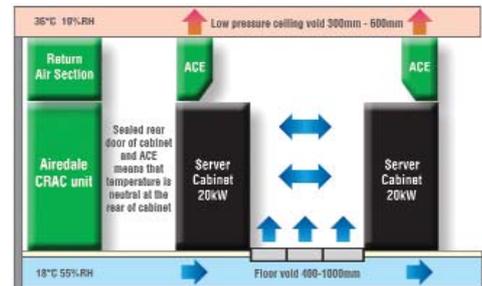
Airedale ECHO Monitoring & Control System (EMCS)

ECHO: Space-saving and operationally-friendly

The ACE combined with the Airedale ECHO CRAC unit creates a temperature neutral environment that intelligently measures and provides the air volumes demanded by each individual rack. Because the hot discharge air from the servers is managed, there is no re-circulation into the IT space eliminating the need for any hot aisles. This allows the optimum utilisation of data hall floor space.

Since the Airedale ECHO CRAC unit provides the primary heat transfer of the cooling system, the ACE is completely dry, involving movement of air only. Moreover all noise is contained. The ACE unit is contoured to allow data cabling to the rear of the cabinet and allows access to the rack without impairment. The Echo system ensures that the entire data centre, front and rear of rack, is at server inlet temperature creating a more comfortable working environment for IT operatives.

ECHO system: Typical operating parameters



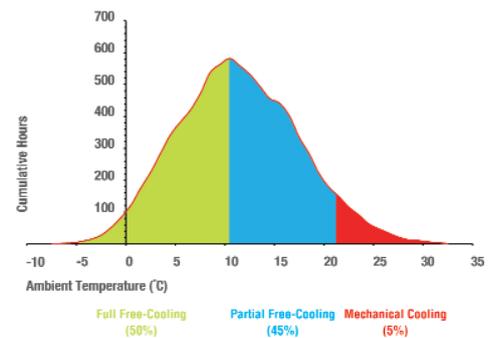
Higher temperatures for more free-cooling, more of the year

With the higher operating temperatures of the ECHO system, concurrent free-cooling and mechanical cooling can be achieved for 95% of the year and full free-cooling for over 50% of the year. The graph shows the ambient profile for London, where the ECHO system enables free-cooling even with ambient temperatures up to 21°C.

Free-cooling is achieved indirectly, which means there is no introduction of air from outside which would require a higher degree of filtration, humidification and a full mechanical cooling installation for times of peak load. This keeps operating costs to a minimum and reduces indirect carbon impact.

In comparison to a conventional downflow system, the energy reduction of the ECHO system is approximately 67% and in comparison with a conventional free-cooling system, the energy saving is approximately 46%.

ECHO system: Concurrent free-cooling/mechanical cooling for 95% of year



Complete confidence

Designed to support critical IT services, the ACE is fitted with redundant fans (N+1) and quick change controls and fan drawers. In the event of a high temperature alarm, a damper opens to vent the discharge air to the room, preventing rapid overheating of the cabinet. The ACE also features a hot swappable fan tray and control panel.

Design features for increased redundancy of the ECHO system include dual power supply as an option in the CRAC unit; dual circuit configuration in the free-cooling chiller and dual temperature sensors in the air stream of the ACE unit.

ACE: Designed for resilience

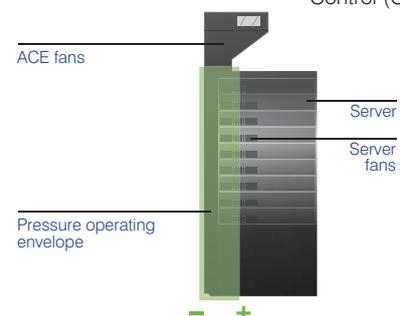


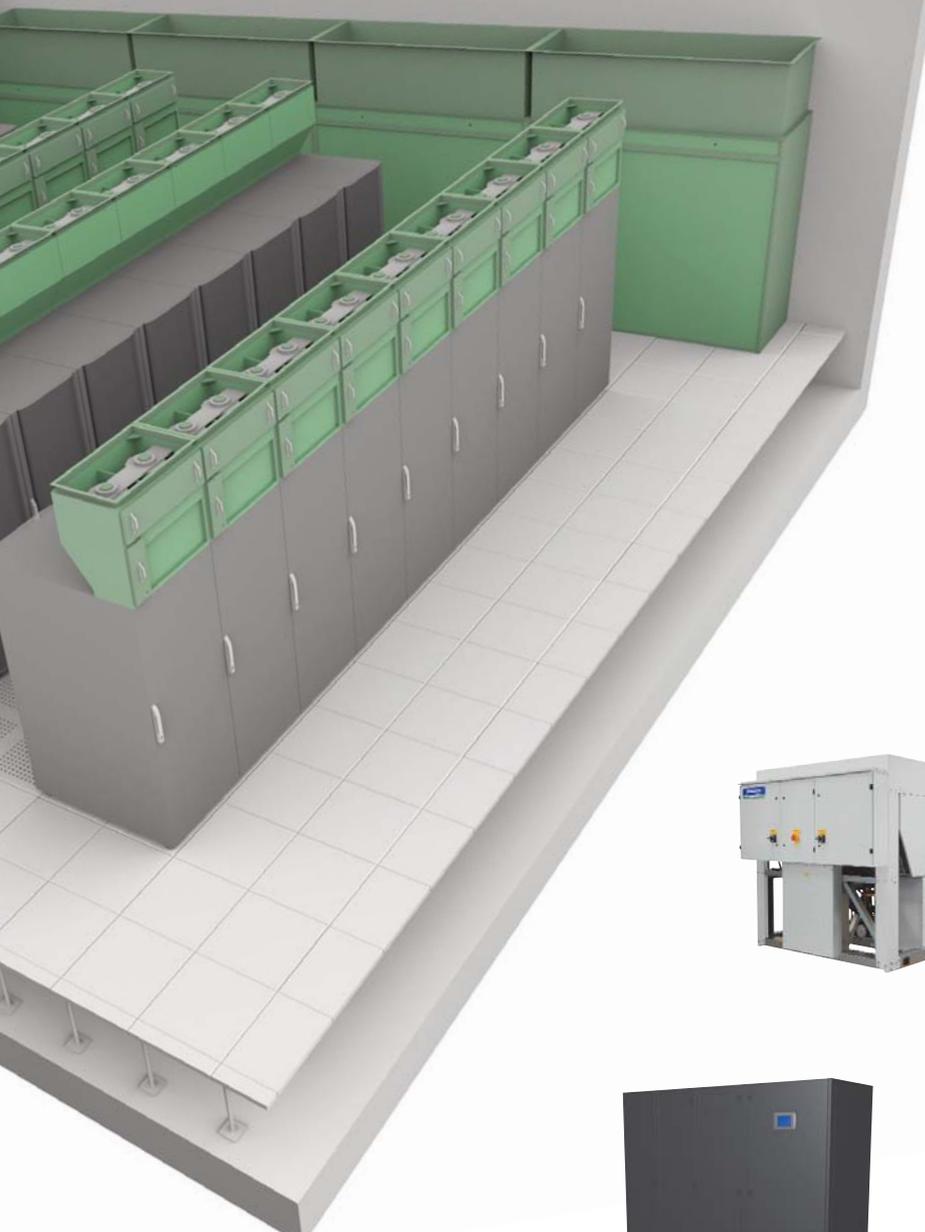
Pressure differential management

By measuring pressure in the server rack, the ECHO system controls the ACE fans to ensure they mirror the fans cooling the servers inside the cabinet. The ACE is sympathetic to IT hardware and is fitted with the exclusive Cabinet Differential Pressure Control (CDPC) system maintaining pressure in the rack within the server design envelope, whilst still ensuring temperature is controlled.

Monitoring points of the control system maintain a positive pressure within the floor void and at the front of server, while creating a negative pressure at the rear of the IT cabinet and return air void to ensure no discharge air short circuits to the server inlet. Slight differential pressure across the IT hardware is precisely controlled so that air is not 'forced' through the IT equipment.

ECHO system: Cabinet Differential Pressure Control (CDPC)





ACE

2 – 20kW

Twin EC variable Speed Fans
(N+1 up to 18kW per rack)

Pressure monitoring at front and rear of cabinet

Dual temperature sensors in air stream

Exhaust damper



Airedale ECHO free-cooling chiller

20 - 1,350kW

R410A, R407C and R134a free-cooling chiller

ESEER up to 5.69

Class A EER up to 3.68



Airedale ECHO CRAC unit

6 - 150kW

DX R407C, R410A and/or chilled water

Single/dual circuit or dual cool

Free-cooling

EC fan

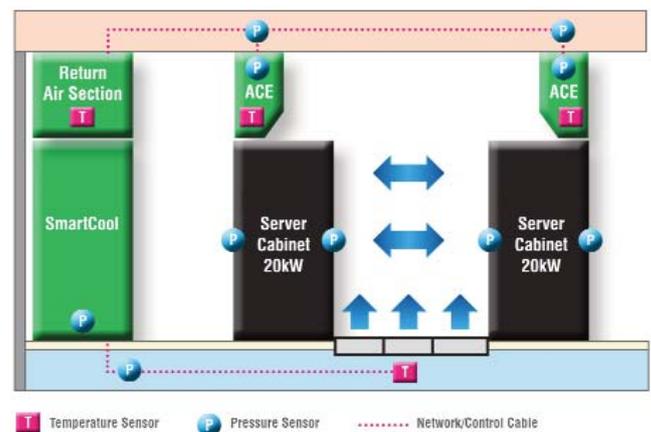
ECHO Monitoring & Control System

The Airedale EMCS is the dashboard of the ECHO system, providing quick analysis in terms of energy usage and able to display real-time PUE as well as other energy ratios and data relating to system health.

Run and stand-by temperature sensors in the air streams of the server cabinets and the Airedale ECHO CRAC unit ensure that each system component maintains precisely the right air flow, temperature and pressure in response to changes in the heat dissipation and air throughput from the IT hardware. Chillers are sequenced depending on demand and prevailing ambient conditions to provide optimised performance and maximise any available free-cooling.

Whilst the robust, open architecture of the control system enables a fully transparent user interface, both at local and remote level, it is also secure in terms of access and security.

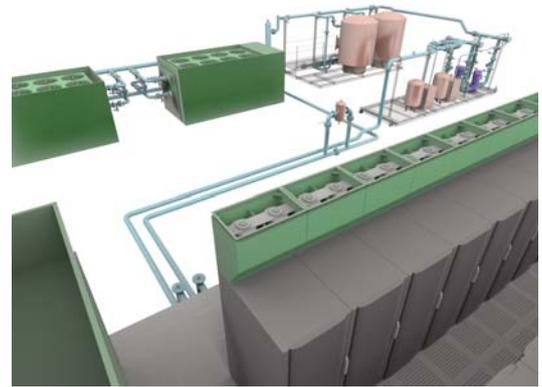
ECHO Typical controls methodology



Looking forward - as your data centre grows

By installing the ECHO cooling system, it is possible to future proof the data centre such that it can operate at low, medium and high densities.

The system also allows a uniform heat load density per cabinet that can be altered over the life cycle of the data centre, so there is no need to stipulate high density cabinet positions from day one.



Examples of other Airedale products

PRECISION AIR CONDITIONING

Our precision air conditioning units maintain accurate control of room temperature and humidity. Ranges include:



EasiCool
6 - 60kW



AlphaCool
8 - 101kW

CHILLERS

Airedale high efficiency chillers supply chilled water to precision air conditioning systems, heat exchangers and comfort cassettes. Ranges include:



TurboChill/FreeCool
200 - 1100kW



LogiCool FreeCool
20kW and 40kW

SafeCool Service Plan – maintaining your precision air conditioning system efficiency ChillerGuard Service Plan – maintaining your chiller's efficiency

For more information visit www.airedale.com

- > For the latest information on Airedale products please visit: www.airedale.com
- > Please refer to the technical manuals for more detailed information

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