

# ACP AIRCONDITIONING

ECO - VAP



Refrigerant

Free

Cooling



# ECO - VAP

## Refrigerant Free Cooling

The ECO - VAP Adiabatic Cooling System.

Adiabatic cooling is a process that has been in use ever since air-conditioning was introduced, Even before this the ancient Egyptians identified its application by means of evaporative cooling tanks on the roofs of their houses with wicks passing down and over the open doorways and windows providing a cooling effect now known as "Dessert Cooling".

In line with present day and future thoughts A C P Airconditioning have updated the system to offer a means of cooling without the necessity of installing mechanical chillers.

By using air to air plate heat exchangers with water atomising nozzles on the exhaust air side cooling can be achieved on the supply air side of the system. As the process is applied to the exhaust air this benefit is accomplished without the addition of moisture to the incoming fresh supply air.

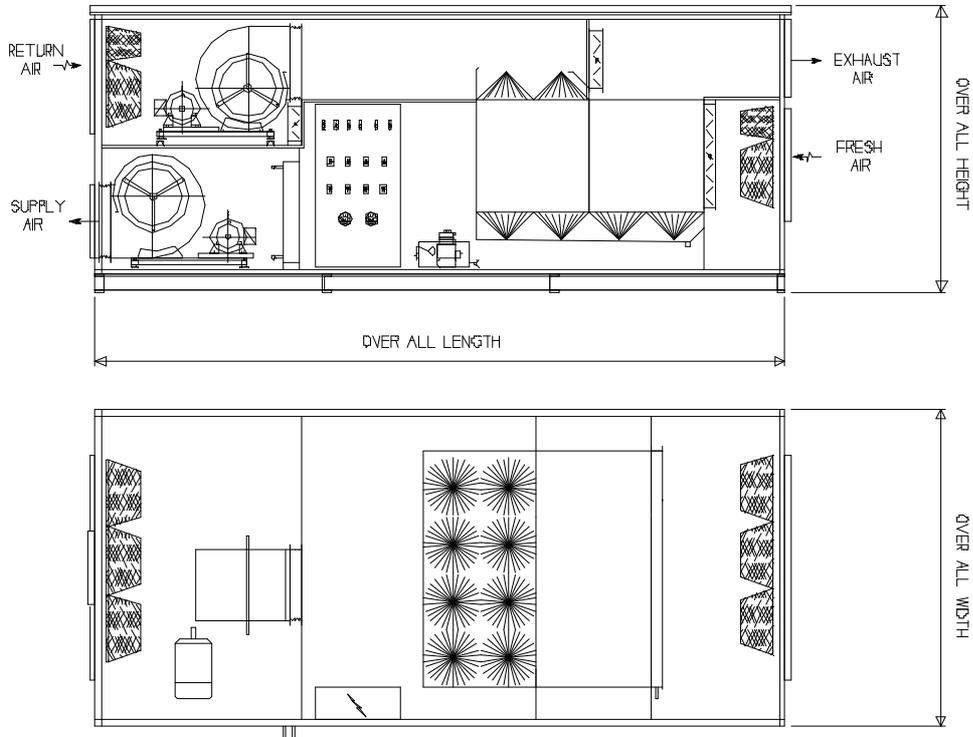


Dependent on the return air wet bulb condition, up to 10 C reduction in supply air can be achieved .

In the event of very high cooling requirements The ECO - VAP package can be supplied with supplementary cooling.

Free cooling, variable fresh air, partial and full heat recovery can all be achieved with the simple in built DDC control system providing a fully integrated energy centre.

The water circuit includes for full hygienic protection components and when integrated with our unique control scheme provide a high integrity package.



**REFRIGERANT FREE (a)**  
**10 C COOLING, (b)**  
**85% HEAT RECOVERED (c)**

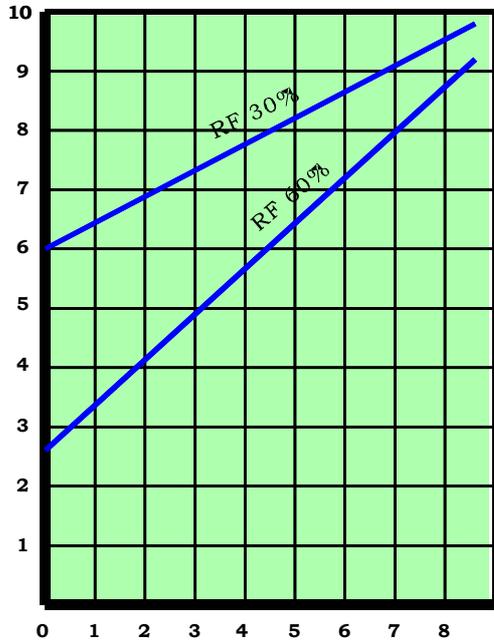
- a. The ECO - VAP system uses the principal of indirect adiabatic cooling
- b. Under certain return air conditions 10 C cooling can be achieved
- c. Maximum heat recovery energy efficiency in winter heating season.



# ECO - VAP

## Refrigerant Free Cooling

Tu - Tt C



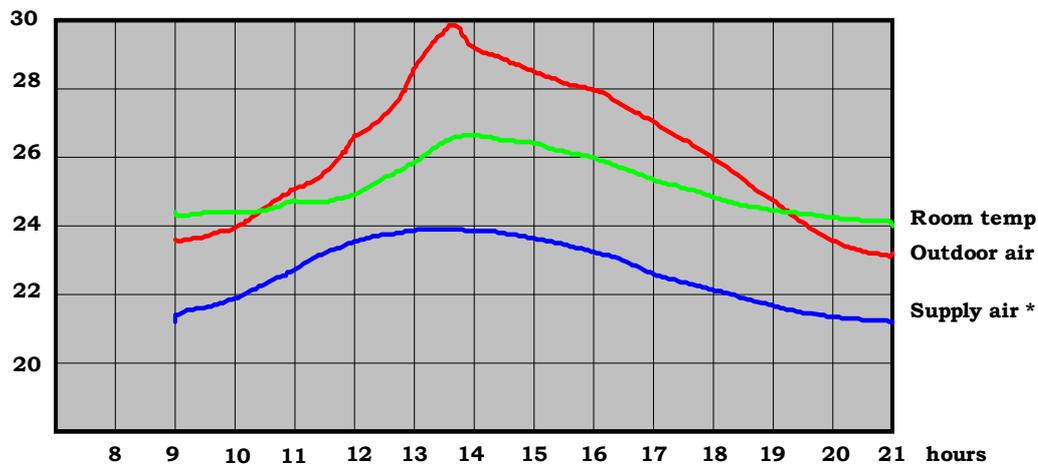
### Nomenclature;

- Tu Outdoor temperature C db
- Tt Supply air temperature C db after heat exchanger
- Tf Exhaust air temp Cdb
- RF Exhaust air relative humidity

### Example;

- Tu 30 Cdb
  - Tf 24 Cdb
  - RF 30 %
- $T_u - T_t = 8.7$  Cdb reduction in Outdoor air db temperature.

Temp C



Example above is drawn from field test data in an industrial

\* After heat exchanger



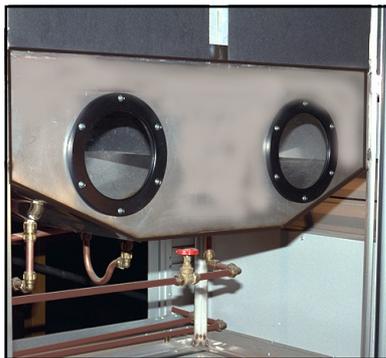
# ECO - VAP

## Refrigerant Free Cooling

The ancillary component parts of any full ECO - VAP package are standard from our range of "CONSORT 2000" Advanced Air Handling Equipment, for full technical description of individual elements, please refer to publication "Consort 2000".

### **STANDARD ECO - VAP SPECIFICATION**

Ecovap adiabatic cooler section: Is fitted with a double epoxy treated aluminium plate exchanger arranged in a stainless steel tank and sprayed with recirculated water. The integral water circulating system includes pump, strainer, volume flow control valve, 'magnetic' filter, ultra-violet disinfection device and spray nozzle.



Recirculated water is drained into a collection tank complete with make-up ball valve, solenoid valves are fitted on the intake and drain lines for

automatic blow-down and shut-off control. Face and by-pass dampers of aluminium blade construction to be fitted with control actuators fitted and wired to the control panel.

### **Electrical controls (where included)**

A system control panel to be recessed into the side of the Unit, containing all power and control components, prewired internally and terminating at a main door interlocked isolator, ready for site connection of a permanent 400/3/50Hz 4 wire supply by others. Power switchgear to include DOL starters for supply and extract fans and spray pump, complete with mcbs and run and trip indicators.

### **Basic control operation.**

The plant to be controlled by a DDC unit, with temperature control only.

This basic features are for the control of supply condition in either heating, free cooling and adiabatic cooling mode by means of modulating 3 way valves on the frost and main heater batteries, the control of the heat recovery system by modulating motorised dampers to meet with set point conditions and the control of the adiabatic cooling system.

Full low ambient frost protection is also included.

### **2. Additional Controller functions:**

These additional features are available as extra's

- a. Inbuilt fully programable time switch.
- b. Low energy input startup procedure.
- c. Spray system safety protocol.
- d. Low temperature heat boost.
- e. Low supply temperature limit circuit.

### **3. Extra items:**

If you have any specific requirements that are not represented within this publication, please refer to the A C P Airconditioning sales office to discuss, in detail, your specific requirements.

## CABINET SPECIFICATION.

### FRAMEWORK:

Each AHU or AHU section is fabricated with a framework of 50mm extruded aluminium boxed section with die cast aluminium or nylon corner joints and accessories.

**OPTIONS:** Anodised finish, nylon corners and accessories, extensions for valves, bulkhead lights wired to outside switch, enclosures for control panel, enclosure with internal walkway (on larger units).

### PANELS:

The frame is clad with 25mm thick double skinned insulated panels, which fit into the rebated edges of the corner or intermediate section, to form a continuous flush surface.

Minimum metal thickness is 0.9mm and outer skin is plasticised steel sheet. Inner skin is self-finish galvanised steel sheet. Standard colour finishes are available.

All access panels are sealed against framework with "rubber" gasket.

On 50mm framing, a tubular rubber gasket can be mechanically fitted to a preformed groove in the section for extra quality seal.

**OPTIONS:** 50mm panel thickness, increased metal skin thickness, range of alternative colour finishes, range of acoustic constructions - high density board, perforated inner skin, septum plates, thicker panel skins, etc.

### ACCESS PANELS:

Panels secured in place by hand operated compression latches.

Complete with pull-off grips or grab handles (depending on panel size).

**OPTIONS:** Lift off doors, hinged doors, tool operated lockable handle, key operated lockable handle, hand operated half turn compression latch, double handle with internal release, inspection windows, electrical interlock switches fitted.

### INSULATION:

25mm thick mineral wool slab, minimum density 45 Kg/m<sup>3</sup>

**EXTRAS:** High density acoustic infill.

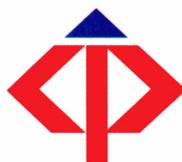
### BASES:

Each AHU (or AHU section) is normally fitted underneath with a base frame.

After fabrication the base is cleaned, primed and finished in black hammerite paint or anodised on aluminium bases.

**EXTERNAL AHU:** Fitted with pitched weather roof overhung all round as standard. All fixed panels mastic sealed in place and additional gaskets used on removable panels.

PRESENTED BY



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