



GEA Greenco Ltd



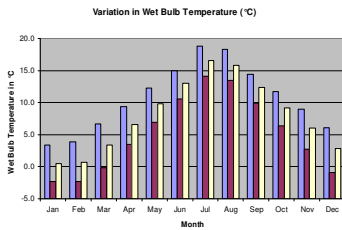
## ECO - SYSTEMS:



**How the weather can help your business meet it's efficiency target.**



### Average weather conditions.



**The graph shows the optimal temperature difference between ambient air and condensing temperatures.**

**Combined with ambient air fluctuations, the return on investment will be within 4 months, based on a refrigeration plant with a capacity of 500kw.**

## ECSS (patent application 0510239.7) Background

In today's business environment there is continual drive for energy efficiency gains. Refrigeration plant is a major user of energy and optimisation of operation yields significant benefits. Whether driven by legislation, taxation or cost reduction to maintain competitiveness, GEA Greenco's ECO SYSTEMS range of products can help your business to achieve these goals.

### ECSS

The most important piece of equipment for efficient operation of the refrigeration system is the condenser. All the energy which enters the refrigeration cycle from the heat sources (people, product, transmission, compressor/pump losses etc.) has to be removed through the condenser. Typically a condenser is located remotely and less attention is paid to its operation.

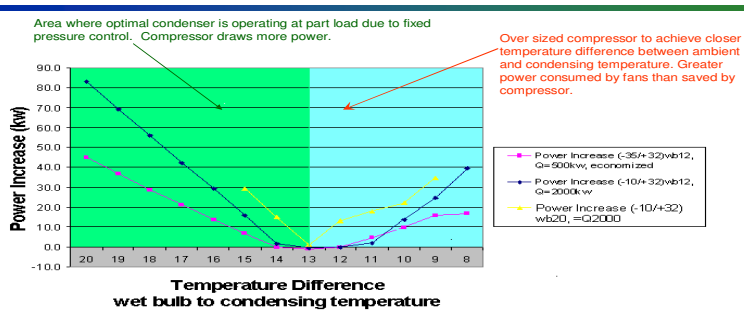
The vast majority of refrigeration systems are set to operate the condenser fans between 28°C to 35°C condensing temperature throughout the year, based on the "design" summer conditions, with a wet bulb temperature of 21°C. Fine... if this weather condition was constant.

Although a condenser is sized for summer conditions as above, this occurs for less than 1% of the year. The average wet bulb condition in London is 9°C, after all 50% are night time temperatures and there are significant seasonal fluctuations! The setting above does not make best use of the condenser as for most of the year it's either off or operating on part load.

Every 1°C the condensing temperature lowers, the compressor increases efficiency by 3 - 4%, impacting on power required whatever the motor size. ECSS is programmed to take over the control of any condenser system, to automatically optimize the performance of this area of the refrigeration plant.

**A refrigeration system being controlled in this way can achieve efficiency increases of approximately 30% throughout the year.**

### Optimal Condensing Temperature Difference



### Leading Technologies. Individual Solution

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## Advantages

Automatic control of the systems condensing temperature/pressure set point based on the ambient weather conditions.

As the ambient temperature changes, the optimal condensing temperature set point is continuously calculated.

Saturated temperature conversion for five refrigerants.

## How it works

Integral in the unit is a combined wet bulb and dry bulb electronic thermometer which accurately measures the local temperature.

The systems plc has been programmed to interrupt the existing control philosophy and take over this control of the condenser sequencing.

There is an optimum temperature difference between ambient and condensing temperature/pressure. This temperature difference is maintained until the lower limit is achieved (minimum condensing temperature).

The system includes settings for a variety of refrigerants and either air cooled or evaporative condensers.

A minimum condensing temperature is included and is important for reasons such as expansion valve control, differential oil pressure requirements for compressors and oil carry over.

Care should be taken over possible inappropriate sizing on existing oil separators to reduce risk of oil carry over.

The lower the condensing temperature, the lower the compressor power consumption. However the closer to the ambient temperature, the more fan power will be absorbed to achieve this temperature to the point where greater power is absorbed by the fans than saved by the compressor.

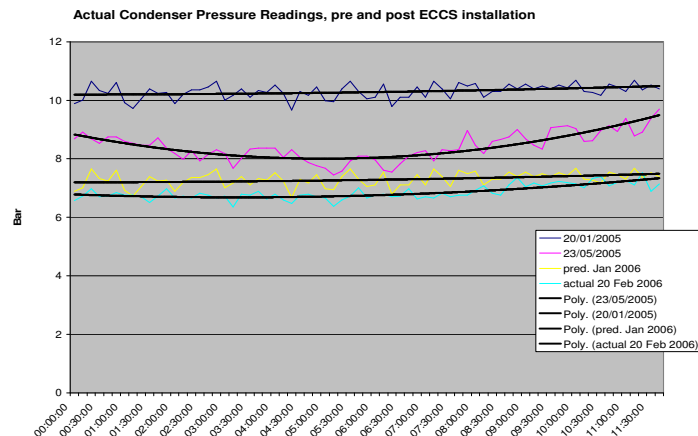
ECCS ensures this optimum difference is achieved continually, by floating the required differential set point to compensate for reduced efficiency real time.



## Package Includes

- ECCS control panel.
- Manual by-pass.
- PLC (Siemens, Telemecanique, Mitsubishi options)
- LCD display
- Instruction Manual.
- Necessary sensors.
- Additional parts, pockets, fittings for sensor.
- Complete mounting instructions including:
  1. Installation notes
  2. Wiring Diagram
  3. Configuring Table
  4. Maintenance Manual
- Voltage 240v / 50Hz

**For further details please contact your local Gresco office**



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