



COOLNOMIX ENERGY CONTROL SYSTEM PERFORMANCE REPORT FOR APPLE HOTEL





EXECUTIVE SUMMARY

Apple Hotel had invited Agile8 Consulting Limited to demonstrate how the **COOLNOMIX™** Optimized Refrigerant Supply (ORS) technology can reduce the energy costs of air conditioning equipment installed in their hotel rooms.

The **COOLNOMIX™** device is an active energy controller which uses a comparison of the room temperature and cold supply air temperature to optimise the running time of the compressor without affecting the room temperature. The compressor is the main power consuming component in any air-conditioning system.

For this test a **COOLNOMIX™ AC-01** was installed on 5 June 2013 in the Apple Hotel premises at 221 Wan Chai Road Hong Kong. Here the **COOLNOMIX™** unit worked with a **GALANZ** air-conditioning unit installed in one of the rooms. For the purposes of the test the **COOLNOMIX™** unit was set to operate at a working temperature of 23°C.

Comparative energy consumption tests were carried out on a 24 x 7 basis during week commencing Monday, 10th June 2013 using the **COOLNOMIX™** equipped **GALANZ** unit in one room and an identical **GALANZ** air-conditioning unit which was also set to 23°C in another room. Power consumption measurements were made using two WattsClever EW4006 visual power monitors.

The comparative testing program finished on Monday, 17th June 2013.

At the conclusion of the test it was confirmed that the **COOLNOMIX™** delivered air-conditioning related energy saving was consistently better than **40%**.

	Without COOLNOMIX	With COOLNOMIX	% REDUCTION
June 17 th	41.84	24.82	40.7
June 15 th	34.44	20.07	41.7
June 14 th	27.46	15.87	42.2
June 13 th	20.78	11.5	44.7



1. INTRODUCTION

The **COOLNOMIX™** energy control system makes use of a patent applied for technology called Optimized Refrigerant Supply (ORS). Developed for use with air-conditioning and refrigeration units, **COOLNOMIX™** is designed to reduce operational costs by minimising energy consumption while maintaining required temperature levels in business critical environments such as those encountered in the hotel industry.

In operation, once the **COOLNOMIX™** unit has achieved a required room temperature, energy savings are delivered by reducing the running time of the compressor which is the main energy consuming component in any air conditioning system.

The **COOLNOMIX™** AC-01 energy control system for air conditioning makes use of two temperature sensors to carry out important tasks, namely:

- Firstly, **temperature control at the required level.** The **COOLNOMIX™** unit will ensure that the compressor runs all the time until a required room temperature has been achieved (e.g. 23°C).
- Secondly, **optimising energy savings.** **COOLNOMIX™** achieves this by controlling temperatures more effectively than a conventional thermostat. A conventional thermostat with the set point of 23°C might allow temperatures to range between 22°C and 24°C. By contrast, **COOLNOMIX™** would attempt to maintain temperatures within +/-0.25°C of the target temperature.

Another benefit is that the **COOLNOMIX™** unit eliminates the problem of dripping which is increasingly a focus of legislation regarding air conditioning operations.



2. COOLNOMIX INSTALLATION

For this test a **COOLNOMIX™ AC-01** was installed on 5 June 2013 in the Apple Hotel premises at 221 Wan Chai Road Hong Kong. Here the **COOLNOMIX™** unit worked with a **GALANZ** air-conditioning unit installed in one of the newly refurbished rooms as shown in Figure 1 below. For the purposes of the test the **COOLNOMIX™** unit was set to operate at a working temperature of 23°C.



Figure 1. COOLNOMIX Installation

Comparative energy consumption tests were carried out on a 24 x 7 basis during week commencing Monday, 10th June 2013 using the **COOLNOMIX™** equipped **GALANZ** unit and an identical **GALANZ** air-conditioning unit which was also set to 23°C in another newly refurbished room. Power consumption measurements were made daily using WattsClever EW4006 visual power monitors attached to each of the subject air conditioning units.

3. RESULTS OBTAINED

Figure 2 below indicates the energy consumption situation at the conclusion of the **COOLNOMIX™** energy saving trial.

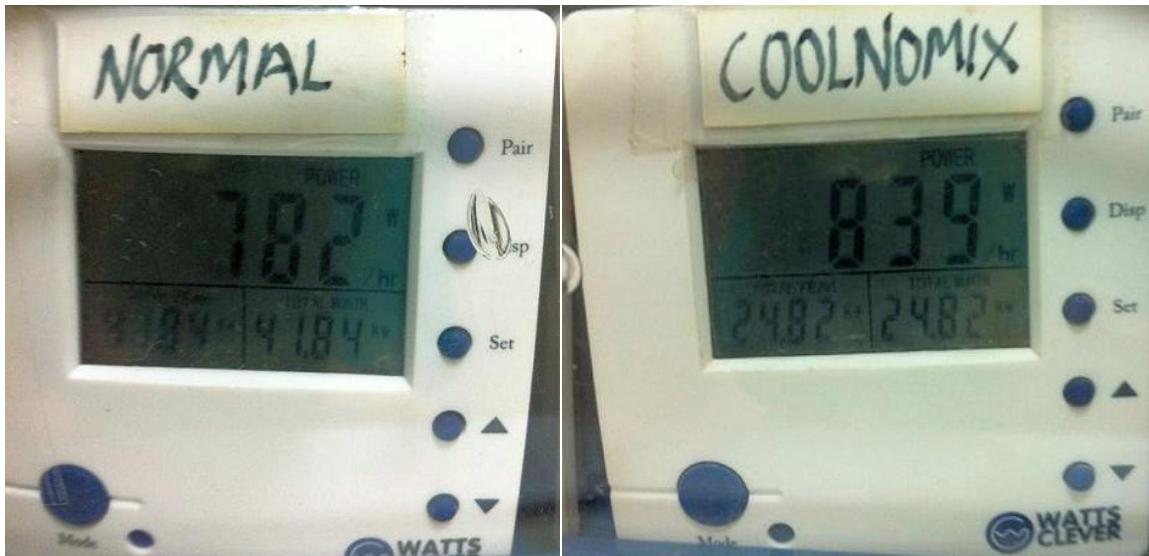


Figure 2. Final Power Consumption Figures

Power consumption figures are shown in the lower part of each of the displays in Figure 2 above. It can be seen that the total power used by the **Galanz** air conditioning unit working in 'NORMAL' mode was **41.84 kilowatt hours** at a setting of 23 deg C. During the same period the total power used by the '**COOLNOMIX™**' equipped **Galanz** air conditioning unit was **24.82 kilowatt hours**, again at 23 deg C.



3. ANALYSIS OF RESULTS

Analysis of the power consumption figures illustrated by the two WattsClever visual power monitors indicates a significant energy saving during the week long trial at your 221 Wanchai Road site, as shown in the table below:

	Without COOLNOMIX	With COOLNOMIX	% REDUCTION
June 17th	41.84	24.82	40.7
June 15th	34.44	20.07	41.7
June 14th	27.46	15.87	42.2
June 13th	20.78	11.5	44.7

It can be seen that the **COOLNOMIX™** delivered power saving was consistently above 40% throughout the week. It should be noted that this power saving is on the low side of what might be expected in a real situation as many hotel guests will set the air-conditioning thermostat below 23°C. When set to low temperatures the air-conditioning unit will work harder to deliver required cooling with the result that power consumption and cost figures will escalate significantly.

The benefit of using the **COOLNOMIX™** unit is that the hotel management can set a minimum temperature allowed without reference to individual guests. From a psychological perspective running the unit consistently at a chosen temperature (say 23°C) while allowing individuals to believe they are achieving a lower temperature makes good sense as individuals naturally adjust to a temperature on hand as they cool down.

4. CONCLUSIONS

Overall, the results of this trial indicate that the **COOLNOMIX™** energy control system can be very effective in reducing operating costs and delivering significant energy savings while preserving temperature levels within a business critical environment where temperature stability is a major concern.



4. REPORT ACCEPTANCE

Apple Hotel had invited Agile8 Consulting Limited to demonstrate energy saving performance of the **COOLNOMIX™** energy control system when installed on a **Galanz** air conditioning unit at their 221 Wanchai Road site.

During a week long trial the average temperature within two subject rooms was maintained at **23°C** and the final comparative energy saving was as follows:

	Without COOLNOMIX	With COOLNOMIX	% REDUCTION
June 17 th	41.84	24.82	40.7

Apple Hotel

Company

Mabel Chan.

Name



Signature & Company Chop

Agile8 Consulting Limited

Company

Kevin Moore
CEO

Name



Signature & Company Chop