

## ClimaCheck in Supermarkets



ClimaCheck Performance Analysers have proven to be instrumental to save energy in supermarkets around the world. **ClimaCheck onsite** is used for inspections, trouble shooting. More than 500 portable systems are used all over the world to validate performance and trouble shoot systems. **ClimaCheck online** monitor hundreds of supermarkets in Europe/US/Canada offering continuous energy monitoring versus the systems "energy profile" and early warning - if any component lose performance. Normally the SMS or E-mail alert will give plenty of time to fix the problem before perishable goods is at risk.

### Fixed installation in Italian supermarkets

After initial demonstration on a supermarket in Milano ClimaCheck performance analysers were installed as pilot test on six supermarkets.



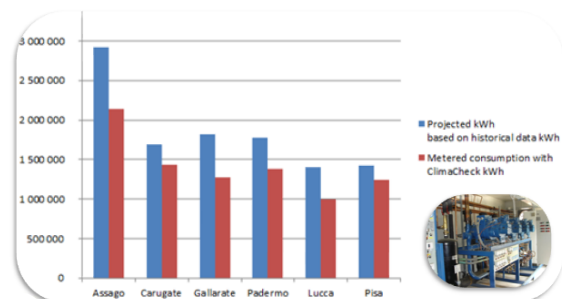
A team of experts from the supermarket, their contractor and ClimaCheck evaluated the base line operation of each plant followed by a series of optimisation measures that included i.e.:

- ✓ Repair of compressors were isentropic efficiency is low
- ✓ Correction of charge level on system that during some conditions proved to be over or under charged
- ✓ Adjustment of controls to reduce energy consumption
  - Reduce start and stop through optimisation of settings and time delays

- Avoid unnecessary low evaporation and minimize condensing through optimised set points

- ✓ Cleaning of condensers with high temperature difference to ambient
  - ✓ Adjustment of economisers
- Total achieved savings for the seven month test-period in these six stores were 318 000 Euro.

Reduction of electricity 23% = savings of 318 k€ in 7 month test



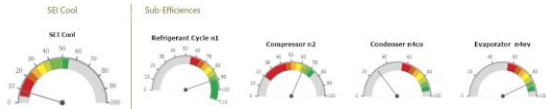
### State of the art commissioning

In Sweden, where a experience of performance analyses is increasing, it is common for leading users to require that performance is measured and documented at commissioning in accordance with the Swedish guidelines (AMA) that correspond to ClimaCheck performance analyses. To validate that performance is in accordance with specification and that the commissioning is completed offers a security and avoids of unnecessary service calls and reduces the risk for loss of goods.

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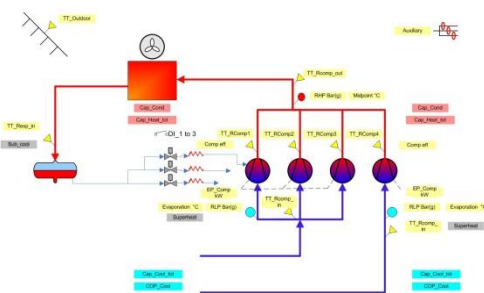


A commissioning were the refrigeration process is documented analysed in detail also reduces the risk of warranty cost for the equipment supplier and contractors. In connection with warranty inspections it is important to validate that the system does not have "hidden" issues that will result in costly failures.



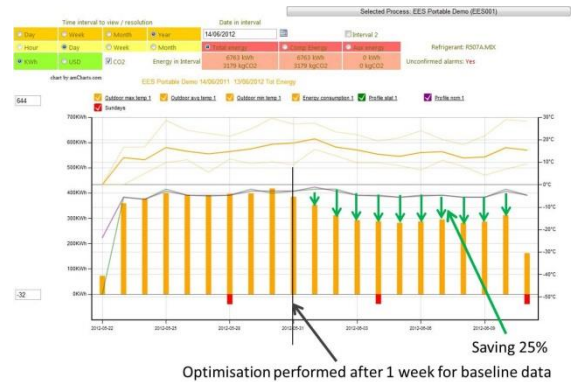
## Optimisation project – Supermarket pack in Portland, Oregon

A portable ClimaCheck was installed to monitor a refrigeration rack during one week to establish baseline performance and information for optimisation.



The analyses of measurements resulted in series of corrective actions to optimise control strategy. Measurements supervised and analysed by third party consultants over the following week with similar climate conditions proved that an energy saving of 25% had been achieved.

The measurements also clearly indicated that further savings and increased reliability would be achieved if system circuiting was modified as the low load on one circuit caused rapid cycling and low average evaporation.



## Testing of new technologies

ClimaCheck is often used by equipment manufacturers, contractors and supermarket operators to validate the performance of new designs and technologies such as i.e. hydrocarbons and trans-critical CO<sub>2</sub> systems to ensure optimum performance in test rigs and plants.

New technologies offer new opportunities for environmental friendly refrigeration but also new challenges when the drive towards energy efficiency require more fine-tuned systems with advanced controls and heat recovery.



ClimaCheck is cooperating with leading universities and research institutes in the fore front of the technological development.