



Improve energy efficiency and reduce HVACR failures





ADVANTAGES WITH CLIMACHECK

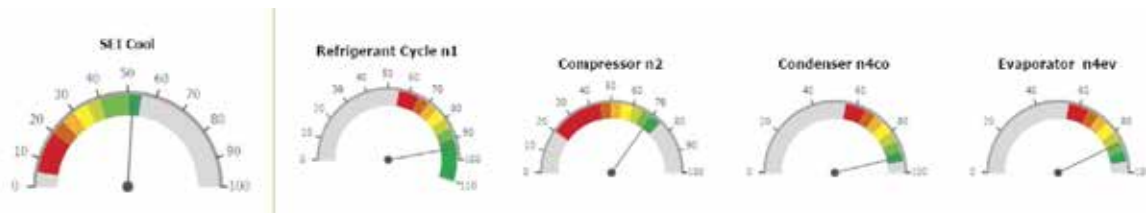
With ClimaCheck you will reduce energy costs, breakdowns and environmental impact, which saves money and reduces loss of perishable goods and production. In the hospitality industry, frustrated customers are avoided.

REDUCING ENERGY CONSUMPTION AND ENVIRONMENTAL IMPACT

ClimaCheck identify inefficiencies, documents baseline performance and provides early warning for system weaknesses. You can compare the cost of energy optimisation against calculated savings once a performance baseline is documented, ensuring your investment is paying back. Studies and practical experience show that ClimaCheck can reduce energy consumption by 10-30%. As 20% of world energy consumption is used by refrigeration processes, these energy reductions directly affect global carbon dioxide emissions.

DECREASE REPAIR COST AND EXTEND LIFETIME

Breakdowns in refrigeration and air conditioning systems are expensive and frustrating. Continuous monitoring with ClimaCheck allows most problems to be addressed long before failures occur. In this way you can minimise service visits and maintenance costs. Component replacements can be planned as degradation sets in, maintaining system energy efficiency and preventing failures. Reduced failure rates also minimise product waste, production downtime and loss of goodwill. For those working with refrigerated food, air conditioning, process and data cooling, improved reliability allows you to cover more customers with the same staff. Decreased number of service calls reduces the carbon footprint as travelling is minimised.



SEI - System Efficiency Index and the sub-efficiencies for the main components are powerful tools developed by ClimaCheck, test Institutes and trade organisations in Europe to visualise performance for operational staff, maintenance technicians and engineers. The conventional indicators kW per RT, COP or EER do not give reliable information in the field where systems often operate far from rated performance.



AWARD WINNING SYSTEM

WWF estimates that ClimaCheck technology can save 72 million tons CO₂ per year in air conditioning alone. ClimaCheck allows property owners, contractors, consultants and manufacturers to scientifically analyse and evaluate practically every type of cooling or heat pump system. ClimaCheck uses an unbiased method to document performance and provides information on all potential areas for improvement and savings.

CLIMACHECK onsite

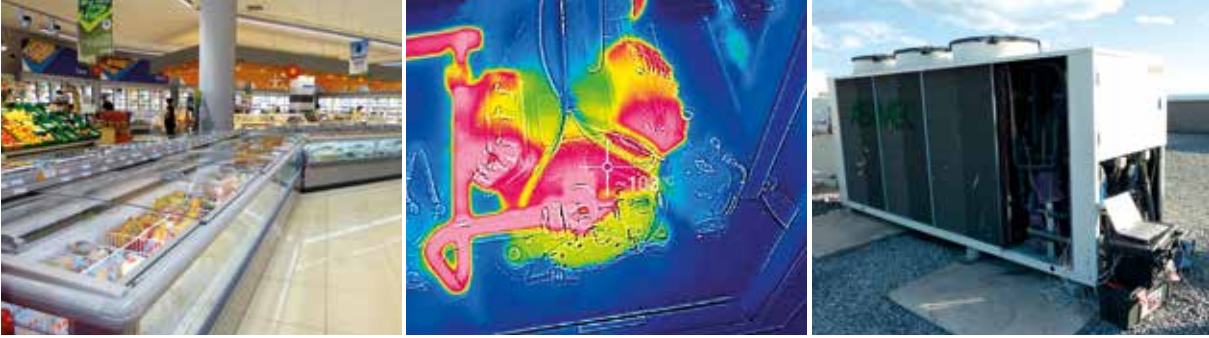
For portable measurements and verification during commissioning, maintenance, performance inspections and energy audits, use ClimaCheck *onsite*. Connect sensors – often in less than 30 minutes and you will have a complete analysis on how well your HVACR-system

is running. You can then document the results of adjustments in real time.

CLIMACHECK online

A permanent installation provides continuous monitoring of energy consumption, compressor and system performance. ClimaCheck sends alerts (email or SMS) if performance deteriorates, and you can log in at any time to ClimaCheck *online* from any computer or mobile device. You will have access to real time information with a dashboard, energy signatures and reports. Compressor and heat exchanger performance, as well as potential refrigerant leaks and the equipment energy profile are monitored 24/7.





OPPORTUNITIES

The majority of cooling systems are not working as efficiently as they should, with higher energy costs, increased risk of down time or failure, and in the end, increased carbon dioxide emissions as a result. Generally, there is a huge misconception that if a system is cooling and makes a noise, it must be efficient!

“To Measure is to know”

It is necessary to know how your equipment performs in order to reduce operational costs. ClimaCheck offers the best analytical tool and method for optimising efficiency and minimising downtime. It has previously been difficult to cost-effectively measure the performance of refrigeration systems in operation. Not anymore – ClimaCheck turns data into information!

CLIMACHECK network

ClimaCheck was founded on a strong belief that the energy consumption in the HVACR industry must be significantly reduced to minimise the environmental impact. ClimaCheck is a well-proven, accepted method and used by global brands. Carrier, Johnson Controls, Emerson, IKEA, Sobeys, Bureau Veritas, Schneider Electric and Tesco decreases operational cost and carbon footprint with ClimaCheck.

Leading service and maintenance contractors and consultants have enrolled in the ClimaCheck partner program. Together we are improving the performance in numerous HVACR systems. ClimaCheck service its network with training, certification, support and state of the art expertise.



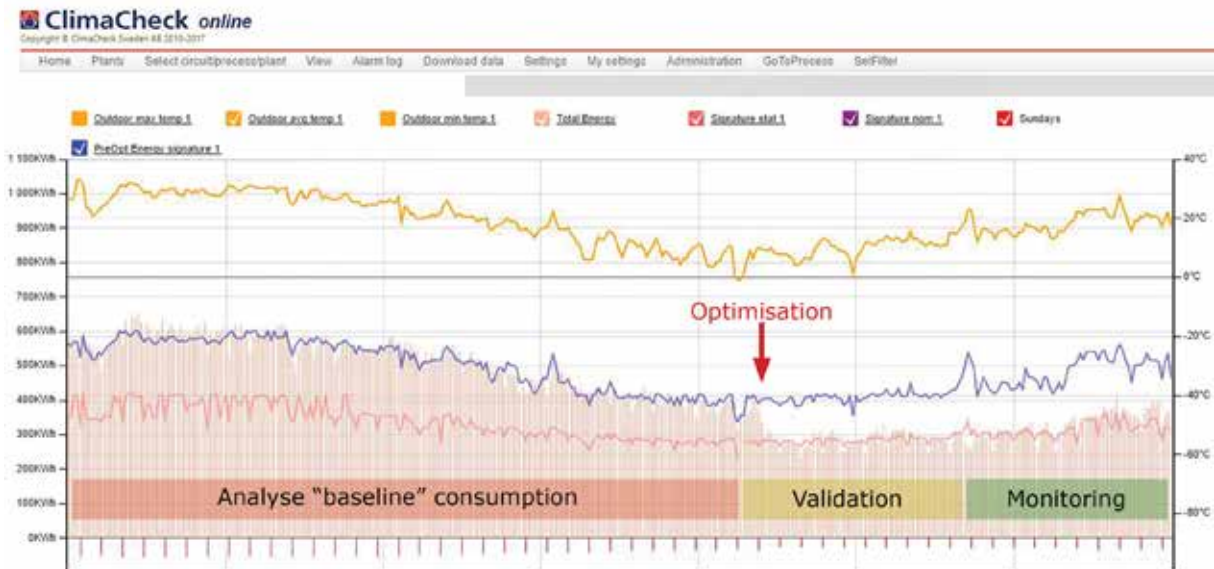
Take the first step towards a more cost and energy efficient business and contact us via email: info@climacheck.com or phone +46 (0)8 502 552 50.

For more information about the **ClimaCheck network**, how to become a Partner or where to find your local partner, send us an email or visit www.ClimaCheck.com

CLIMACHECK – AREAS OF USE

ClimaCheck is used to document all types of vapour compression systems such as refrigeration, air conditioning and heat pump systems:

- **Product and System Development** – leading manufacturers use ClimaCheck for development work and product quality control. ClimaCheck supplies test rig analysing systems to manufacturers.
- **Commissioning/Recommissioning/Warranty Inspections** – ClimaCheck confirms if the plant is running at design/rated capacity and efficiency.
- **Energy Audits/Performance Inspections** – EU Directives require performance inspections of all air conditioning units over 12kW. Incentive programs require commissioning in many markets. ClimaCheck provides accurate and unbiased Measuring & Verification more cost effectively than any other system.
- **Energy Optimisation** – ClimaCheck provides high quality decision support prior to energy efficiency measures in cooling systems and heat pumps. Internet access allows experts to study and diagnose operation effectively from anywhere in the world.
- **Preventive Maintenance and Troubleshooting** – ClimaCheck is used for temporary or continuous Measuring & Verification of HVACR equipment. Predefined performance reports and alarm indicators ensure that the equipment is working efficiently.
- **Leak Detection** – In the EU, the number of annual leak detection visits is reduced by 50 percent when Indirect Leak Detection with ClimaCheck is used.
- **Integration in BAS/BMS/SCADA Systems** – are often good in handling sensors and alarms, but they lack the refrigeration process analysing capability required for early detection of wear or performance degradation in systems. COP, cooling capacity, system efficiency and component efficiencies can be communicated from ClimaCheck *online* to existing monitoring systems through standard protocols over a ClimaCheck gateway or server to server through API's.



ClimaCheck online makes it possible to monitor your HVACR-system and to apply energy optimisation and preventive maintenance, which normally leads to 10-30% energy savings. It is also possible to receive early text/email warnings if the system's energy signature is changing, and allowing you to fix problems before a breakdown.

HOW AND WHY CLIMACHECK IS DIFFERENT

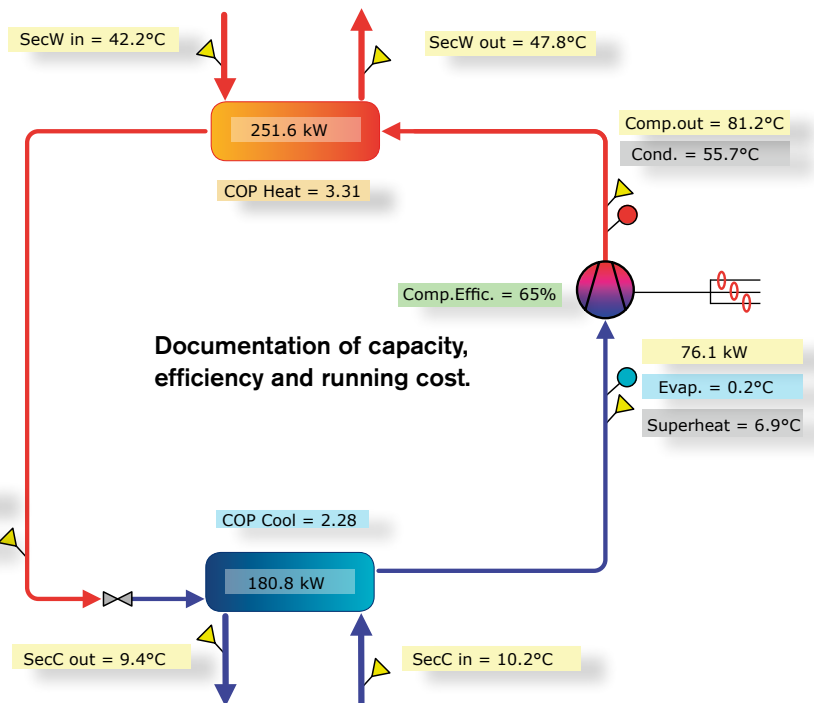
Compared to traditional measuring of HVACR systems based on air and water measurements, ClimaCheck collects key inputs from the refrigeration circuit and performs unique unbiased analysis of the refrigeration process. The results are more accurate and reliable than that available from other systems. Performance of the total process is visualised, as well as component efficiencies. Key information allows experts to troubleshoot and optimise HVACR systems remotely. With ClimaCheck you take the next step to an energy efficient system, not only measuring performance in real time, but also allowing optimisation and online verification. ClimaCheck benchmarks system performance in an unbiased way against design and manufacturer's data.

MORE ACCURATE AND RELIABLE PERFORMANCE MEASUREMENT

The ClimaCheck method is scientifically based on a thermodynamic evaluation of measured data. By connecting ten measuring points on a basic system, data is collected and used for calculations and analysis. ClimaCheck provides complete information that no other system does, including:

- Cooling and Heating Capacity (kW)
- Coefficient of Performance COP/ EER
- SEI – System Efficiency Index
- Compressor Isentropic Efficiency
- Condenser Efficiency
- Evaporator Efficiency
- Electrical Power Input
- Air/Water Flow Rates
- Superheat/Sub-cooling values
- Indication of excess or inadequate refrigerant charge

Exp.v.in = 51.8°C
Subcool = 4.0°C



SAVE ENERGY, TIME, FRUSTRATION AND MONEY WITH CLIMACHECK

Optimisation with ClimaCheck often leads to decreased failure rates, reduced energy consumption with 10-30%, less losses in production and valuable goods. This leads to a more profitable operation with satisfied and loyal customers. Early warnings make it possible to plan your maintenance and reduce



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