

## 5<sup>th</sup> International Training

### ClimaCheck-based Performance Analysing, Trouble-Shooting and Optimisation

International Training – April 14-15, 2016 in Madrid, Spain.

ClimaCheck and RefriApp in Spain offer a training in performance analysing of refrigeration, air-conditioning and heat pump systems.

Globally 15-20% of the electricity is used by refrigeration processes used everywhere in the society to preserve perishable goods, avoid overheating of processes and keep acceptable comfort for people by cooling or heating.

To maintain temperature is critical for the end-user business but maintaining temperature alone is no longer sufficient.

The new environment offers new business opportunities for consultants and contractors and ClimaCheck has developed state of the art technology to analyse and optimise these systems. ClimaCheck onsite and ClimaCheck online gives you state-of-the-art methodology for true performance analysis of all types of RAC systems and is increasingly becoming part of the everyday work for contractors, consultants and equipment owners around the world.



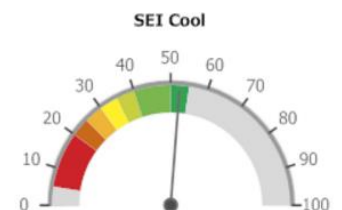
**Competence is the key for the future professionals to lead the change.**

**Certification from "ClimaCheck Training" is required to be listed as "ClimaCheck Partner".**



**ClimaCheck Sweden and RefriApp** invite you to a two day Technical Training Course, focused on:

- Business opportunity and challenges when focus on energy efficiency increase in RAC sector.
- ClimaCheck **onsite** and **online** performance analysing
- Performance Inspections and Energy audits
- Discuss experiences from Cases with experts
- Trouble-Shooting and Energy Optimisation



The Course is aimed at professionals with a good experience and understanding of refrigeration processes in **refrigeration, air conditioning and heat pump systems**.

Basic understanding of the thermodynamics and practical understanding of the components of a system are prerequisites for the course. Exchange of experiences between participating experts will be an important part of training.

**Level 1** - basics of ClimaCheck hard and software. How to use and interpret results and create reports on standard systems. This training is aimed for technicians and engineers who has limited experience of ClimaCheck analyses. For those who has no experience we will send out a demo software version upon registration which we recommend participants to study prior to training.

**Level 2** – Focus on advanced use of ClimaCheck and optimisation of systems for those who has practical experience from a number of measurements and want to develop the skills to measure and analyse more complex systems. Focus is on analyses, trouble shooting, optimisation and reporting rather than ClimaCheck hard- and software.

**Prior experience of ClimaCheck is required to participate in Level 2.**

**Date:** April 14 – 15, 2016 **Start:** 9 a.m. Thursday / **Finish:** 5 p.m. Friday

**Language:** Training will be done in English.

**Cost 2-Day Course:** 400 Euro (including documentation, two lunches, one dinner).

**Reserve your place to Level 1 or 2 now to ensure availability.**

(Maximum 20 participants per course will be accepted).

**Register before March 20<sup>th</sup> at [training@climacheck.com](mailto:training@climacheck.com) or [training@refriapp.es](mailto:training@refriapp.es)**

**Location:** Madrid - Hotel Maydrit, C/Piragua 1, Madrid

**Bookings: Ref. ClimaCheck training:**

Phone: +34 911969200, e-mail: [reservasmaydrit@h-santos.es](mailto:reservasmaydrit@h-santos.es)

Free Shuttle Bus from Airport.

**Accommodation:** Rooms are available at the conference hotel at special price 75-90 Euro/night refer to RefriApp/ClimaCheck reservation or ask us for assistance. Experienced Lecturers from ClimaCheck and experts in the ClimaCheck network will guide the participants through practical and theoretical training sessions. Some sessions will be common and others will be split in groups based on prior experience.

### Training will cover:

- Theory for the thermodynamic evaluation method
- Accuracy of Measurements
- System Efficiency Index and energy signatures
- Practical Measurements and Evaluation of Data
- Use of ClimaCheck hardware, software and website
- Presentation of measurements and results
- Reporting and Case Studies



### Social dinner

After the first day of training we will share experiences of good and bad examples in our industry at a nice restaurant in Madrid!



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## Typical training program ClimaCheck International training

ClimaCheck is the global leader in performance analysing of air-conditioning, refrigeration and heat pump systems. ClimaCheck open the "black box" and document the performance of the process and all involved. ClimaCheck continuously develop methodologies and capabilities of our "tools" and train the industry in their use.

**Companies with ClimaCheck certified technicians can be listed as ClimaCheck Partners.**

### Business opportunities for those with competence in energy optimisation

Equipment owners are gradually becoming aware of the unnecessary high running cost and environmental impact of their refrigeration and air-conditioning systems. The interest for "Measuring and Validation", energy optimisation and performance contracting is growing. Savings have been achieved in many energy consuming technologies in the building sector such as lightning, heating and ventilation but in air-conditioning and refrigeration the saving potential is largely untapped due to lack of established methods to document, analyse and optimise systems cost effectively. The industry largely lack tools and competence to deliver the 20-40% savings many surveys show as possible with no or low investment.

### Preliminary program ClimaCheck Level 1 and 2 training

Below is an outline for Level 1 and 2 training that will be adapted to the participant's background and interest. We encourage participants to inform us about interesting cases to evaluate prior to our trainings. We have extensive experience of thousands of plants and try to select and adapt "cases" to the interest of the participants.

**Experience exchange is an important part of the training as several of the lecturers and participants are leading experts in their sector of the industry.**

		Day 1		Day 2	
		Level 1 (basic)	Level 2 (advanced)	Level 1 (basic)	Level 2 (advanced)
9:00 - 09:45	1	Global Outlook Intro to ClimaCheck software and ClimaCheck online updates		9	ClimaCheck online - overview - capabilities - latest update
09:45 - 10:45	2	System Efficiency Index - SEI* Introduction to a new way to benchmark systems and components		10	Software practical work ClimaCheck online Energy profiling - statistics - alarms
10:45 - 11:30	3	Hardware, sensors application standard program, accuracy, configuration	Software - Special templates i.e. oil/motor cooling, economiser, air properties, transcritical	11	Interpretation of data Evaluation - components - System and controls Optimisation Chiller, Industrial Recip - Screw - centrifugal
11:30 - 12:00		Coffe break		Coffe break	
12:00 - 12:45	4	Pre -measurement - Scoping - Commissioning		12	Optimisation basic Optimisation - cont
12:45 - 13:30	5	Software - standard use and handling	Interpretation of data Trouble shooting	13	Reporting System - example Optimisation, Supermarkets Direct - indirect - transcritical
13:30 - 14:15	6		Experiences - Application Cases from around the world,	New refrigerants - Market opportunities R404A alternatives/retrofits - HFOs - Hydrocarbons -CO2 - NH3	
14:15 - 15:15		Lunch		Lunch	
15:15 - 16:00	7	Hardware, none standard sensors, communication, Integration, Gateway		15	Plan measurements and extend services
16:00 - 17:00	8	Reporting - communication of results Templates and examples		Conclusions - Market opportunities - Cases from around the world, experiences - questions	
17:00 - 17:30		Power measurements - correct connection to none standard configuration		Departure	
20:30		Joint Dinner			

\* ClimaCheck is leading the work with developing the concept of System Efficiency Index - SEI - that facilitates benchmarking and communication of performance to "none experts".