effi automation

Chillers
4G
Webserver
Real-time monitoring
Power meter
Heat pumps
Refrigeration
IP65
Ethernet
Heat/cool meter
COP/ERR
Non-intrusive
IoT
MQTT
Energy Manager
Zigbee
Modbus
Online Monitoring
Industrial Design
Reference Baseline

PilotE² HVACR

HVACR energy efficiency analysis ecosystem

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PilotE² HVACR

Improve HVACR systems energy efficiency and lifetime

Future is becoming gray due to greenhouse gases whose increasing emissions we don't get to contain and the consequent climate change. Scientists continually alert us to these planet threats whose first cause is an excessive energy consumption and fossil fuels burning.

Between 15-20% of global electricity consumption is used for refrigeration and air conditioning (HVACR). Depending on the climatic area it can represent up to 50%.

Most of HVACR systems don't work as efficiently as they were designed, which means a higher energy cost and an increasing risk of failure and, in the end, increased CO2 emissions.

The PilotE² method

The **PilotE²** method calculates refrigeration or heat pump thermodynamic cycles performance based on thermodynamics principles.

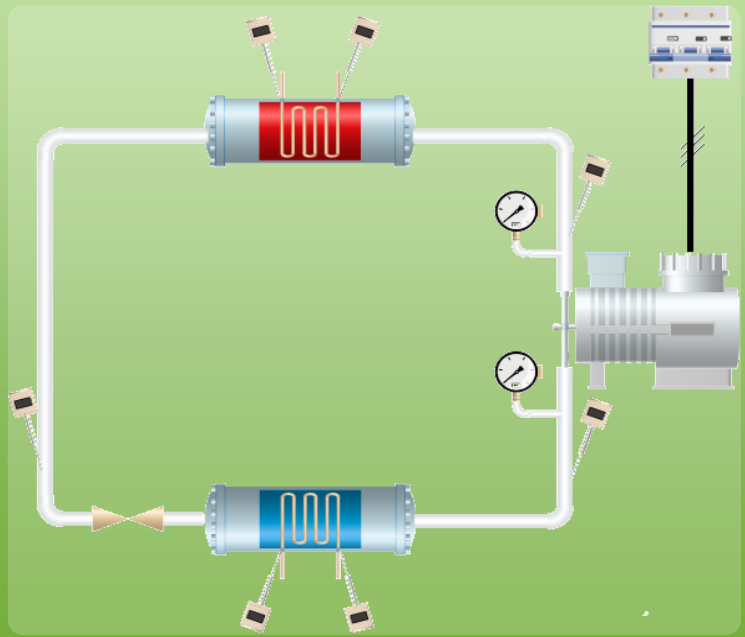
The **PilotE²** method is a direct and indirect methods combination, using the best of each. It uses a direct method to determine instantaneous performance but also measures evaporator or condenser energy, when possible, to obtain additional information on final energy use.

The **PilotE²** method use only six measurement points in a simple setup, one power meter, two pressure sensors (high and low compressor pressure) and three temperature sensors).

Reliability and accuracy

The **PilotE²** method is a more reliable and accurate than other methods based on air and water measurements. It allows to calculate this Key Performance Indicators (KPI):

- Cooling and Heating Power (kW)
- Coefficient of Performance COP/ EER
- Global System Efficiency
- Compressor Isentropic Efficiency
- Condenser Efficiency
- Evaporator Efficiency
- Electrical Energy Consumption
- Air/Water Flow, Power, Temp. Delta, Energy
- Superheat/Sub-cooling values



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Two versions for one purpose: energy efficiency

PilotE² Iceberg
The portable version

PilotE² Iceberg is the portable version suitable and useful for energy savings measurements and verification, during commissioning, maintenance, performance inspections and energy audits.

Plug-and-play

PilotE² Iceberg is a plug-and-play solution ready to install with many templates in the application catalog to analyze you HVCAR plant. Ad-hoc templates can be supply on demand.

Non-invasive

PilotE² Iceberg is a non-invasive solution. Temperature sensors are installed on pipe surface, pressure sensors in manometers or pressure leads and clamp-on or Rogowsky coils current sensors and voltage magnetics leads.

Industrial design

Rugged, reliable with IP65 protection degree, **PilotE² Iceberg** is the right tool to monitor HVACR machines or plants in outdoors or industrial environments.

Energy Audits 4.0

PilotE² Iceberg is a connected portable instrument. You can decide dynamically how much time is suitable to determine the HVACR system operation.

PilotE² Permafrost
The permanent version

PilotE² Permafrost is the permanent or fixed version suitable and useful for continuous energy efficiency and operation monitoring.

Supervisor and Online monitoring

PilotE² Permafrost is a HVACR plant supervisor, capable to send email alerts on threshold or malfunction events. Intuitive real time Web-based HTML5 apps for system operation by operators and maintenance staff from any connected device.

Control

PilotE² Permafrost is powered by a PLC and can control your HVACR plant to optimize the performance

Energy Management

PilotE² EMS is a cloud-based SaaS with many advanced features and tools such as dashboards, reports, cost and energy analyses, KPIs, IMVP projects and much more.

IoT and Refrigeration 4.0

Do you want to use your energy efficiency data for monitoring and analysis in the cloud? **PilotE² Permafrost** is an open solution for an easy and secure connection. You just have to decide which cloud platform to send your data by means of MQTT – for example, Microsoft Azure, Amazon Web Services, IBM Cloud or SAP Cloud.

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Manufacturers

Improve product deployment and quality assessment.

Product and System R&D: **PilotE² HVACR** is an excellent tool to develop new products and product quality assessment. We offer testing bench tailored to the customer.

Commissioning/Recommissioning/Warranty Inspections – **PilotE² HVACR** checks and confirms the right plant operation and certifies the exact performance according to designed settings.

ESCO and Owners

Save energy, CO_2 and money and improve the HVACR lifetime cycle

Performance optimization: take saving actions with the best real time information

Reference baseline: set your Energy Services baseline as the reference for future energy savings actions

Energy Management: cost assignments, KPI indicators, ratios.

Sub-metering: energy use discrimination.

Energy savings Measurement and Verification: using IPMVP from EVO.

Dashboards, trends, reports: with the powerful **PilotE² EMS** you can analyze your system to maximize energy efficiency.

Maintainers

A best corrective and predictive HVACR maintenance for a best service.

Energy Performance Inspections; according to EU Directive 2010/31/UE performance inspections are required for all air conditioning units over 12kW.

Preventive and Corrective Maintenance: from eventual to continuous supervision with alarms, alerts, periodic or ad-hoc performance reports to ensure right HVACR plant operation.

Leak check: For existing HVACR systems, good maintenance, including regular leak checking, is key for ensuring best performance and long-term use of a system that may have an older refrigerant in it.

Documentation: with the powerful **PilotE² EMS** you can include pictures even with comments and system description.

Consultants

Save time, hidden costs and increase reliability and accuracy

Non Invasive: analyze the HVACR plant without running stop.

Industrial design: rugged, water-proof, IP65.

Real-time monitoring: embedded Web-server .

Performance ratios: COP and ERR calculation among others.

Reliable and Accurate: more than indirect methods based on air or water measurements.

Datalogger: CSV files in internal memory SD card FTP access.

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