

Success Story



where

- iN's supermarket located in Verona, Italy

what

- Innovative solution for the management of supermarket cabinets and cold rooms
- Water loop controller: new solution for complete water loop management
- Heos Dashboards: new supervisory system functionality for evaluating unit performance

why

- Heos water loop solution for easy installation
- Can be installed with small equipment rooms
- Optimum food preservation

when

- December 2016

who

- Retailer: iN's
- Heos unit OEM: Rivacold
- Installer: Isoklima
- Cabinet OEM: PastorFrigo

Heos sistema: the installer's experience

The new iN's store that opened in Verona in December 2016 is emblematic of the potential of Carel's water loop solution.

Exploiting the simple installation afforded by the use of plug-in units, the Heos sistema was able to be easily fitted in a store in the city's historic centre.

Along with the constant support of Carel, the other players involved in the opening of this store were:

- **iN's**: the 100% Italian-owned discount supermarket chain, part of a leading group, Gruppo Pam S.p.A., with more than 300 stores in Italy.
- **Rivacold**: European leader in the supply of refrigeration systems, in this case supplier of the Heos refrigeration units installed on the showcases.
- **Isoklima**: company specialising in industrial air-conditioning and refrigeration services that, through its qualified personnel, offers installation, maintenance and service for industrial refrigeration systems.
- **PastorFrigo**: company that manufactures refrigerated cabinets for supermarket chains.

Development of this project has demonstrated:

- **the simplicity of the solution**, allowing an installer to purchase complete and tested Heos units and independently install and commission the system;
- **the versatility** of Carel's **advanced** technology;
- **the effectiveness of the predictive algorithms** for complete system control, through the right management of the info acquired in the field;
- **the efficient thermodynamic and energy performance**, monitored using new functions on the boss supervisor for Heos units;
- **the possibility to manage** water loops using a dedicated controller.

Unique features of the project

The store in question represents an example of how Heos can be a business opportunity for installers too, who dealing with the assembly, commissioning, maintenance and repair of refrigeration systems, draw direct benefits from the simplicity and reliability of the solution.

By directly purchasing Heos refrigeration units that are manufactured and tested by leading companies in the sector, system assembly and pre-installation operations are simplified significantly, meaning faster delivery and store set-up.

The use of self-contained units moreover eliminates the need for long refrigerant lines, at the same time reducing the possibility of leaks and related maintenance.

The considerable flexibility further simplifies installation in field, involving simply powering on the units and completing the water loop connections, using plastic pipes if preferred.

Carel's high-end supervisory system – boss – then allows maintenance to be performed via a remote service, with access to typical operating system functions without needing to go on site that means saving time, avoid food waste and reducing the operational costs.



The advantages of the Heos sistema solution highlighted by Isoklima are:

- installation possible with small equipment rooms
- easy installation of the refrigerant circuit, that is also less vulnerable to errors
- much less dirt inside the circuit because of less welding needed
- much easier to identify any refrigerant leaks

Heos sistema

Description of the store and selling area

The Heos sistema solution typically uses stand-alone units designed to house all of the refrigerant circuit components inside of an enclosure:

- DC compressor
- Inverter
- Electronic expansion valve

In the event of special space requirements or smaller evaporators, some showcases can be managed in multi-evaporator configuration, meaning one refrigeration unit serves multiple showcases in parallel.

The iN's store in Verona has seven showcases configured in stand-alone mode, both medium and low temperature, and one showcase configured in multi-evaporator mode; all connected to the same water loop cooled with a simple dry-cooler.

Further features and details of the showcases are shown in the table below.

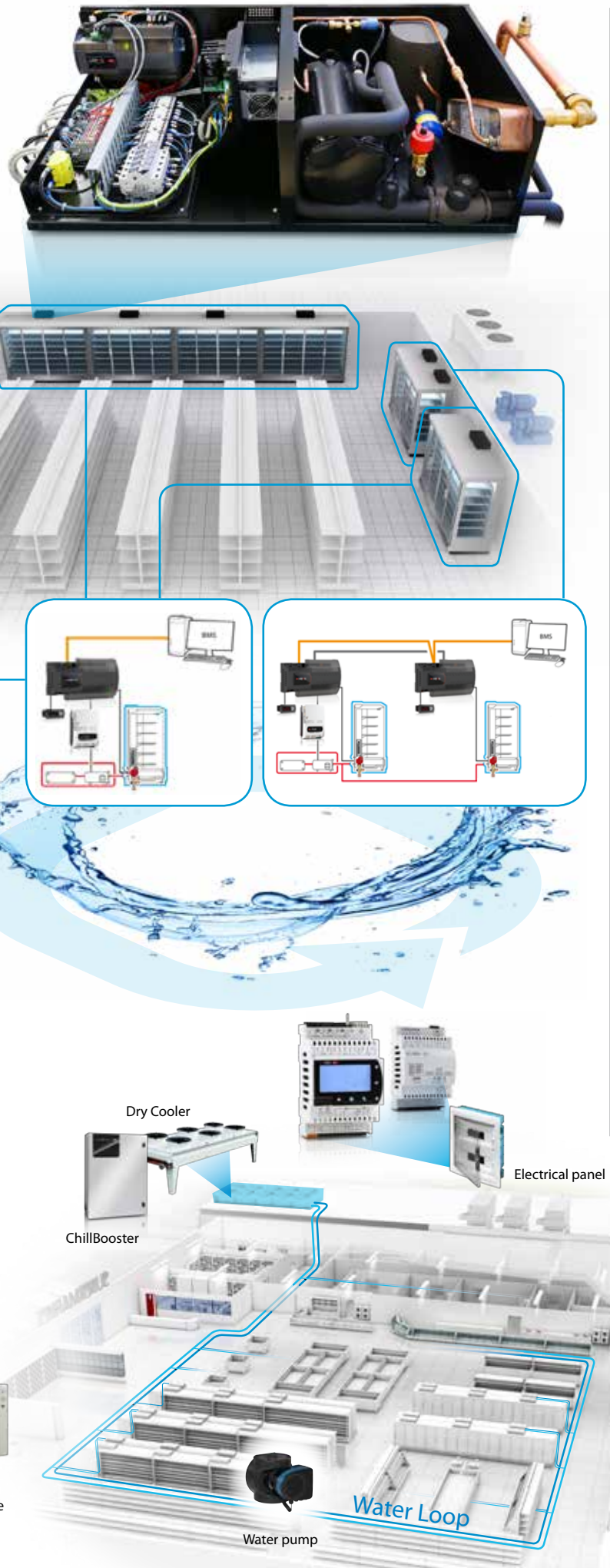
Application	Cooling capacity	Number	Type
MT	15.2 kW	4	Vertical, 3.75 m with doors
	2.55 kW	1	Vertical, 2.5 m with doors
	2.2 kW + 1.5 kW	1	Vertical, multi-evaporator (Master 1.875 m + slave 1.25 m)
LT	4.9 kW	2	Vertical, 3.75 m with doors

Water loop controller

The Verona store features Carel's latest integrated solution for complete water loop management, including control of a drycooler, two variable-speed pumps (the second as backup) and a bypass valve.

Heos sistema guarantees water loop control in the most commonly-used commercial refrigeration configurations, in which Heos manages the showcases. The control board is fitted with a built-in display for setting the parameters directly on the controller, as well as connection to a Carel supervisory system for complete management/service of the refrigeration system.





boss

The new mobile-ready local supervisor

The Verona store also features boss: the new Carel local supervisory system for medium-sized and large installations. In addition to all the functions of a standard supervisor, boss includes all the functions for managing refrigeration units and interaction between units, meaning not only is the system controlled, but also optimised in terms of thermodynamic performance and energy consumption. Carel's extensive and in-depth knowledge of these applications has also led to the development of user interfaces that are configured based on the type of user (i.e. installer, maintenance personnel, system manager), so as ensure simpler and faster commissioning.



Usability

- Completely browsable from mobile devices, from commissioning to daily access for system maintenance
- Easy development of custom graphics using c.web
- Built-in Wi-Fi for access without requiring other network infrastructure
- Instant messaging for alarm management



Reliability

- Robust aluminium casing allows installation in many industrial environments
- Automatic synchronisation of data and alarms with RemotePRO
- Parameter protection against unauthorised modifications



Optimisation

- Control and management of energy consumption
- Unit performance using dashboards
- Integration with Modbus and BACnet systems



Heos Dashboards

In the Verona store, the combination of Heos controllers and boss supervisory system has allowed to introduce a set of new functionalities.

The calculation and display power offered by boss, combined with the information recorded by the Heos controllers, allows immediate and simple analysis of the energy and thermodynamic performance of the different refrigeration units, including comparison against a traditional supermarket.

Extended data acquisition:

- COP
- Power consumption
- Compressor speed
- Outside, control, condensing and evaporation temperature
- Performance comparison between showcases

With quick configuration, in just a few steps the different refrigeration units in the system can be sub-divided into groups with common features. Different types of analysis can then be carried out on the groups: savings, efficiency, group efficiency and quality control.



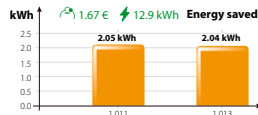
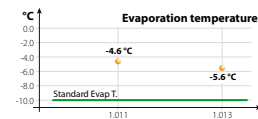
Savings

Performance comparison against a traditional system. Graphic representations of:

- energy savings and environmental impact;
- evaporation temperature on the different refrigeration units.



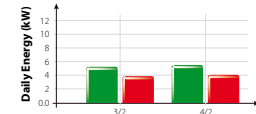
361.76 €
2-78 MWh
1113.09 t CO₂



Efficiency

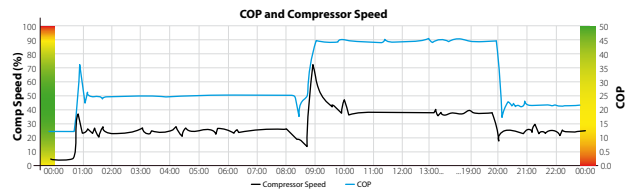
Tabulated and graphic representations of energy performance of individual units compared against group average

Code	Device name	Def	COP	Power (kW)
1.011	HEOS - 11	•	5.88	0.24
1.013	HEOS - 13	•	5.58	0.31
1.012	HEOS - 12	•	5.19	0.43
1.015	HEOS - 15	•	5.14	0.36
1.014	HEOS - 14	•	5.12	0.35



Group Efficiency

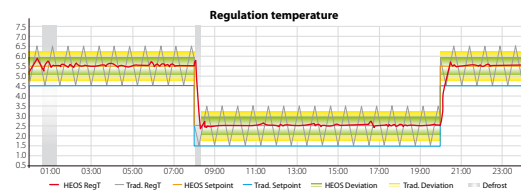
Performance comparison in terms of COP and compressor operating speed on each device, in relation to average trends across the group.



Quality Control

Comparative analysis between Heos and traditional technology via:

- regulation temperature trends;
- mean deviation in control from reference.



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