





Heas sistema High efficiency waterloop system

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Waterloop system for commercial refrigeration

The new frontier in the management of supermarket showcases/cold rooms. A waterloop system for cooling plug-in units with BLDC compressors.

- System that guarantees high efficiency.
- Faster store set-up and lower costs.
- Greater flexibility when modifying the layout .
- Less space occupied by the refrigeration systems.
- Drastic reduction in the amount of refrigerant used in the system.
- Possible integration with the air-conditioning.
- Less refrigeration system maintenance.

By using a water loop to control the condensing stage on refrigeration units, the condensing units can be standardised, thus significantly reducing installation times/costs. In addition, this technology allows greater integration with the airconditioning system.

Building/site efficiency is improved by:

- Lower pressure drop in the refrigeration system
- Efficiency of BLDC compressors and electronic expansion valves
- Heat recovery between the various systems in the building
- Each individual unit works in the best operating conditions, independently of the others





Flexibility

The water loop significantly simplifies changes to the position of the showcases inside the supermarket.



Simple installation

Being fully factory-tested, unit installation is greatly simplified, reducing store set-up times.



CHARMEN LE

80% less refrigerant

Refrigerant charge is drastically reduced, being a closed circuit inside the showcase; the same applies to leakages.



COMPATIBILITY with all climates

The diagrams on the side illustrate the possible configurations for a water loop system, based on local climate.

FREE COOLING ONLY: one loop only, controlling the condensing stage on both medium temperature and low temperature units. Can be fitted with adiabatic evaporation systems in the summer.

LT CHILLER: to maximise the energy efficiency of the low temperature compressors, the two loops can be separated, and operate at two different temperatures. Can be fitted with adiabatic evaporation systems in the summer.

LT CHILLER and MT CHILLER; only for very warm climates, to reduce oversizing of compressors and guarantee energy efficiency.

Operation with Chiller for LT showcases



Free cooling operation



Operation with Chiller for MT showcases and LT showcases



High efficiency plug-in showcases

A water-cooled showcase fitted with a BLDC compressor consumes around 25% less energy compared to a traditional solution.



The water loop carries away the heat of condensation for greater integration with the air-conditioning system.

components in the system.

essential for ensure efficiency at variable

flow-rates.



Predictive algorithms

Complete control of the refrigerant circuit by reading the various values (temperature, pressure) and dynamically managing the various components (compressor, expansion valve, fans) allows the implementation of advanced algorithms for:

- sdefrosting on demand
- estimating refrigerant leaks
- optimising COP
- preventive maintenance



Factory tested

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Benefits of having a fully factory-tested showcase include:

- significantly reducing installation times/costs
- reducing refrigerant leaks (-96%)
- guaranteeing performance

TEWI REDUCTION

TEWI is a measure of the global warming impact of equipment based on the total related emissions of greenhouse gases during the operation of the equipment and the disposal of the operating fluids at the endof-life. TEWI takes into account both direct fugitive emissions, and indirect emissions produced through the energy consumed in operating the equipment.



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HeOS sistema

A complete platform for the management of showcases/cold rooms in a water-loop system.



Usability

Various types of user interfaces are available, according to the intended use:

- PLD or PLDpro to display showcase temperature.
 pGDe for complete programming by service, with a menu divided by functions and a set-up wizard.
- pGDtouch for special graphics needs.





Heos controller

Programmable controller with extensive hardware resources, including:

- 10 universal channels, for analogue inputs (probes) or digital or analogue outputs (pump, fan modulation) using I/O Chip (Carel proprietary, made using ASIC technology)
- 3 analogue outputs (fans, pumps...)
- 7 digital outputs (lights, defrost, fans on-off, general alarm...)
- 2 commands for single-pole ExV (expansion, bypass, liquid injection)
- 3 RS485 serial ports (local network, Fieldbus, BMS)
- 1 SSR output for anti-sweat heaters





Inverter + Compressor

The use of BLDC compressors guarantees better performance in terms of energy efficiency compared to any other technology, thanks to the extended range of modulation of cooling capacity and high motor efficiency.

To achieve this, however, requires sophisticated control (for each model of compressor) of operating pressure (envelope), suitable oil return and management of all alarms.

Power solution

On customer request, we can also develop a complete solution, including the showcase electrical panel with all the system electrical (disconnect switches, contactors...) and electronic components (controller, inverter...).



Supervisor

The supervisory system, as well as optimising system operation, controlling routine maintenance and special service operations, also allows advanced statistical analysis of site energy consumption. Reports, graphs and analysis of the main system KPIs mean users can easily identify the areas of highest energy consumption and check trends over time.

All this can be performed locally and/or via remote.

CAREL Heos sistema products



1 PlantVisor PRO

The supervisor optimises system operation, including in terms of energy consumption.

3 power +

This inverter can control compressors with permanent magnet brushless motors (BLDC/BLAC)

2 Heos

This is the main controller, where system intelligence is concentrated, managing all the components.

4 ExV

The Carel electronic expansion valves stand out for an exceptionally linear response, even at low flow-rates.

5 HMI

A wide range of user interfaces, meaning the right product is available for all needs.

6 Sensors & accessories

Pressure, temperature, humidity probes, energy meters...

7 Electrical panel

We can also supply the electrical panel, including co-design, on request.

P/N	Description
UP2AH010302SK	Heos controller for cabinet - 230Vac power supply
UP2BH010302SK	Heos controller for cabinet - 24V power supply
PGDEH00FZ0	pGD evolution user terminal, panel mounting, HEOS
PLDH0GFP00	PLD PRO user terminal, panel mounting, HEOS
S90CONN001	Connector for pGD evolution display, 3 m long
PLDH0SF400	PLD small display, green, HEOS
PSTCON03B0	3 m cable for PST display
PSD101021A	POWER+ 10 A, 200-240 VAC 1PH, IP00
PSD1012200	POWER+ 12 A, 200-240 VAC 1PH, IP20/IP44
PSD1016200	POWER+ 16 A, 200-240 VAC 1PH, IP20/IP44
PSD10102BA	POWER+ 10 A, 200-240 VAC 1PH, IP00 con coldplate
PSD10122A0	POWER+ 12 A, 200-240 VAC 1PH, IP20/IP44 con coldplate
PSD10162A0	POWER+ 16 A, 200-240 VAC 1PH, IP20/IP44 con coldplate

P/N	Description
E2V09USF10	Single-pole EXV valve E2V09U 12-12 ODF, cable I= 2 m
E2V11USF10	Single-pole EXV valve E2V11U 12-12 ODF cable I= 2 m
E2V14USF10	Single-pole EXV valve E2V14U 12-12 ODF cable I= 2 m
NTC030HP00	NTC temp. probe, HP IP67, -50T50, I=3 m
NTC030HF01	NTC temp. probe, HF IP67, -50T90, strap-on, I=3m
NTC030HT41	NTC temp. probe, HT IP55, 0T150, I=3 m
SPKT0043R1	Pressure probe, 0-5V 0-17.3 barg (0-250 psig),
	multiple pack of 50 pcs
SPKT00B6R1	Pressure probe, 0-5V 0-45 barg (0-650 psig),
	multiple pack of 50 pcs
SPKC002310	3-wire cable. I= 2m, for SPKT pressure probes

Headquarters ITALY

CAREL INDUSTRIES HQs Via dell'Industria, 11 35020 Brugine - Padova (Italy) Tel. (+39) 0499 716611 Fax (+39) 0499 716600 carel@carel.com

Sales organization

CAREL Asia - www.carel.com CAREL Australia - www.carel.com.au CAREL China - www.carel-china.com CAREL Deutschland - www.carel.de CAREL France - www.carelfrance.fr CAREL HVAC&R Korea - www.carel.com CAREL Iberica - www.carel.es

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