

High
Efficiency
Solutions.

CAREL



Euroshop at a glance!



Convenience stores smart solutions for small footprint stores



CAREL retail sistema uses the most innovative plant solutions to maximise the energy savings and manage low environmental impact

CAREL emeter1

Single-phase energy meter, DIN rail mounted, 4 DIN modules, direct connection up to 65 A.



Bottle coolers

Energy saving for bottle coolers up to -35%.



puwpro

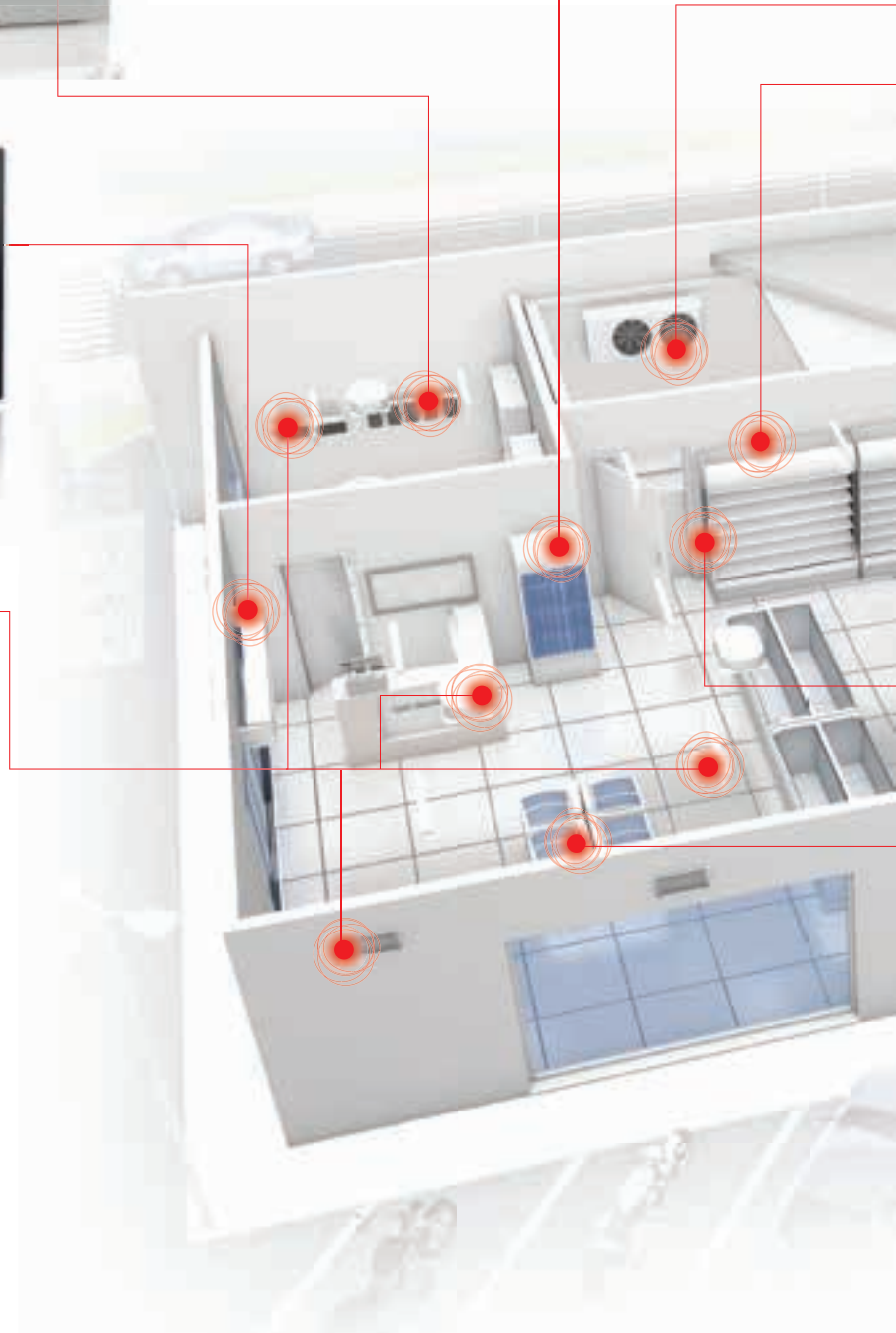


pChrono: the ideal partner for managing lighting and Air-Conditioning

pChrono is the innovative CAREL controller for managing supermarket lights and simple air-conditioning units. It can also be used to manage other loads that require precise and customised scheduling.

Main benefits and features:

- Lighting management
- Scheduled device management
- Pump management
- 10 A wireless socket management
- Universal functions



Cold rooms

The innovative solution for cold rooms based on latest CAREL technology.



Refrigerated units

The maximum form of technology for professional refrigeration.



Chillbooster

Evaporative cooling: Boosts condenser and gascooler efficiency.

Compressor rack

pRack - pR100T: advanced controller for the complete management of all components of a Convenience-store rack. Ideal for CO2 booster applications.

μRack: compact parametric controllers for small compressor racks: intuitive, simple to use and install.

Evaporators EEV kit

ExV sistema provides the highest performing control quality coupling the most powerful EEV driver with the most precise EEV.



Leakage sensor

Refrigerant gas leak detector

Wireless monitoring and control solutions

Zig-bee and Mesh technology for seamless and reduced cost retrofit operations.

- HACCP wireless probe;

- Single-phase wireless energy meter with 10 A on board relay;
- Industrial temperature, humidity and light wireless sensor.

Hypermarket

Integrated solutions for energy savings in retail



CAREL retail sistema uses the most innovative plant solutions to maximise the energy savings and manage low environmental impact

CAREL retail sistema allows complete control and monitoring of the site and the various sub-systems in more complex superstores, efficiently managing alarms and supervision and supplying the users with solutions that allow:

- energy saving and management of consumption;
- reduction of environmental impact via compatibility with the most recent system solutions;
- optimisation of management and installation times via specific vertical functionality for this market.

In CAREL philosophy, the various area controllers allow maximum integration of the different accessories and therefore maximum usability and performance: unique user interface, unique adjustment software in the various applications and complete management through system supervision.



pLoads: the ideal partner for energy supervision and control

pLoads is the innovative CAREL controller for intelligent management of energy consumption; it significantly reduces waste, with considerable cost savings for the end user.

Main benefits and features:

- Scheduling of connected loads
- Load cut-off
- Multiple energy meter and consumption management



CAREL emeter3

three-phase energy meter with removable display, DIN rail or flush-mounted, 4 DIN modules

Compressor rack solutions

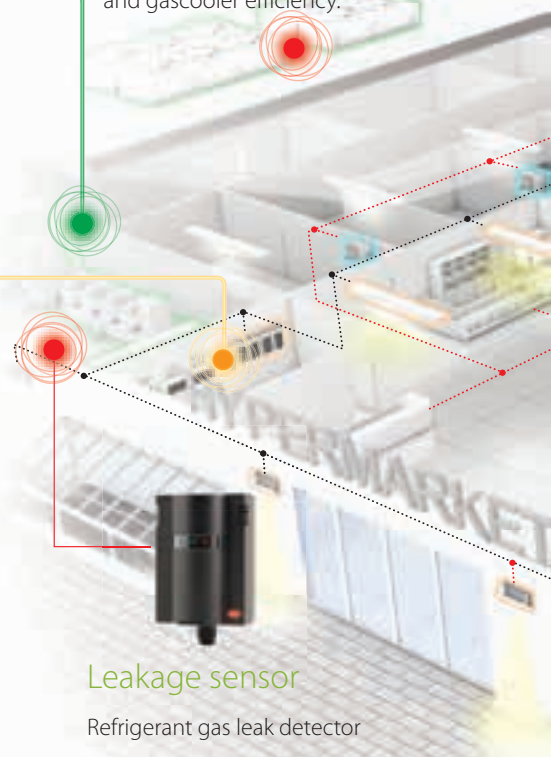
pRack pR300 Cutting edge modular solution for compressor racks with energy saving features. pR300T Subcritical and Transcritical CO₂ system controller platform evolution.

NEW



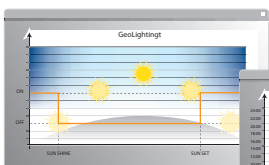
Chillbooster

Evaporative cooling: Boosts condenser and gascooler efficiency.

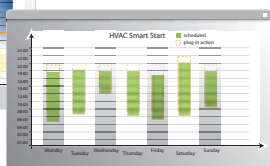


Leakage sensor

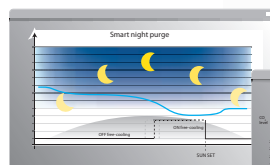
Refrigerant gas leak detector



GeoLighting
sunshine and sunset calculated by latitude and longitude



HVAC Smart Start
the air-conditioning system scheduler is optimised by the value of enthalpy and system inertia



Smart night purge
lower night-time temperatures are used to decrease the heat load of the supermarket, reducing the air-conditioning pre-start time



HVAC Smart Set
the algorithm optimises the temperature set point inside the supermarket according to building occupancy

ECO - HVAC package

CAREL can today provide customers four plug-ins for reducing supermarket energy consumption. HVAC-ECO is available with the Carel PlantVisorPRO supervisory system.





Air conditioning solutions

Leading and comprehensive range for roof-top units, air handling units, chillers and heat pumps. Scalable solutions according to application complexity. Evaporative cooling technology. Geothermal technologies.

Show case solutions

MPXPRO Control solution for display cabinets, cold rooms and embedded management of Electronic Expansion Valves.
EXV sistema Full range of Proportional Expansion Valves both for conventional and CO₂ refrigerant.

Solid State Relay

To be used for rail heaters modulation based on dew point and glass temperature 10A, DIN rail mounting

freshSonic

Evaporative cooling extends the natural freshness of fruits and vegetables



Wireless monitoring and control solutions

Zig-bee and Mesh technology for seamless and reduced cost retrofit operations.

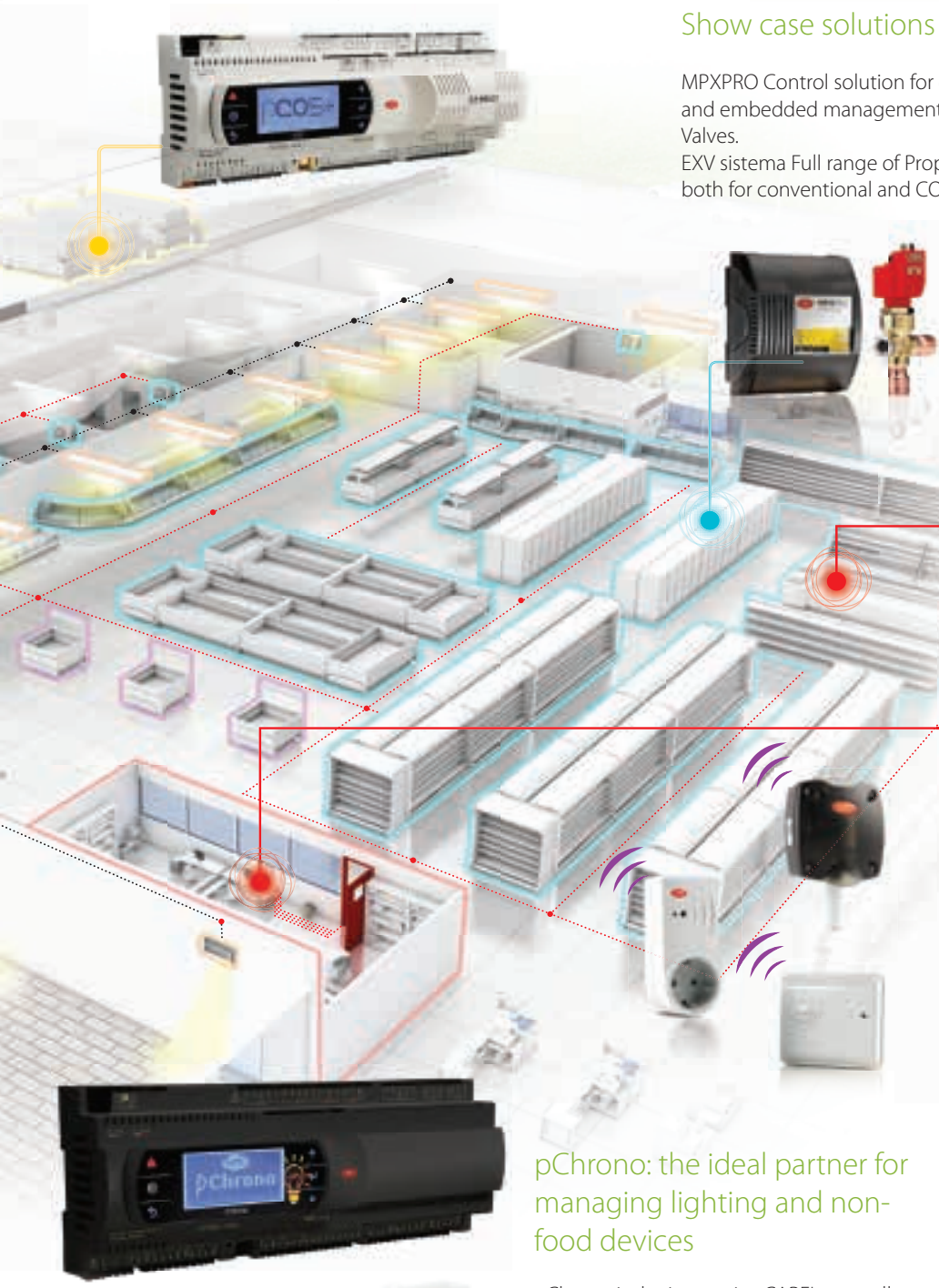
- wireless probe;
- single-phase wireless energy meter with 10 A on board relay;
- Industrial temperature, humidity and light wireless sensor.

pChrono: the ideal partner for managing lighting and non-food devices

pChrono is the innovative CAREL controller for managing supermarket lights. It can also be used to manage other loads that require precise and customised scheduling. pChrono is completely integrated into the PlantVisorPRO supervisory system.

Main benefits and features:

- Lighting management
- Scheduled device management
- Pump management
- 10 A wireless socket management
- Universal functions





pRack platform

Innovative features on a platform that stands out for flexibility, ease of use and energy saving functions



The complete solution for compressor racks:

- pR300: the standard
- pR100T: CO2 condensing unit
- pR300T: transcritical CO2 booster system

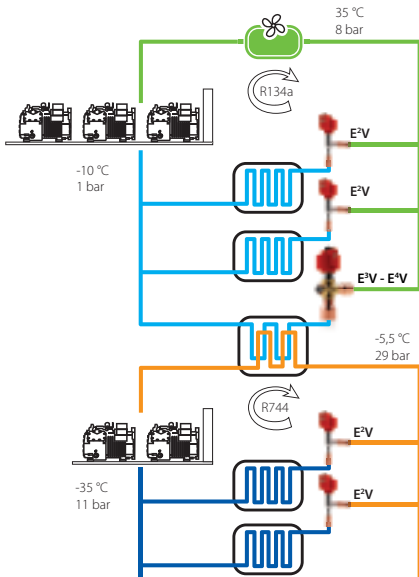
pRack size&more

New App for codes selection, parameters guide and application drawings.



pR300 - solution for subcritical CO2 system

Cascade



Electronic Expansion Valve Synchronization

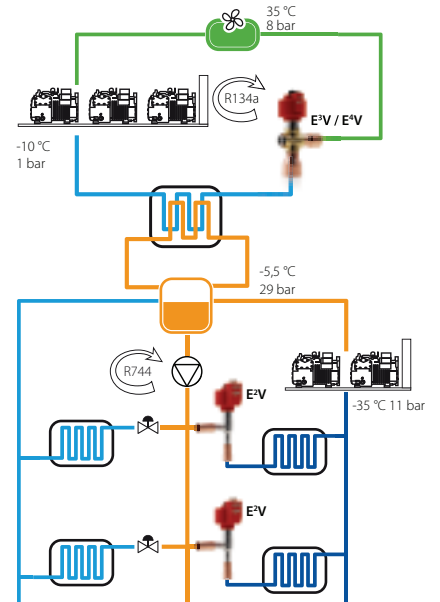
System for direct communication between the compressor rack and electronic expansion valve driver on the plate heat exchanger, built-in on pRack pR300.

The low temperature rack can in this case communicate to the driver any changes in cooling capacity and thus modulate evaporator capacity based on CO2 **condensing pressure**, without requiring additional probes and ensuring fine and precise condensing pressure control.

The medium temperature rack can in this case use an **auxiliary temperature/pressure probe** and set proportional or neutral zone regulation with all parameters and alarms customizable.

Exchanging information between the compressor rack and the Heat Exchanger can improve traditional superheat control with factors that are critical for this type of installation, such as variation in rack cooling capacity and trend in CO2 pressure for MT and LT compressors.

Pumped





Available on the App Store



pR100T - solution for CO2 condensing unit

Complete management of a booster system in a single controller through a simple and intuitive user interface, ideal for condensing unit or small C-store



Complete and integrated solution, from controllers to valves featuring:

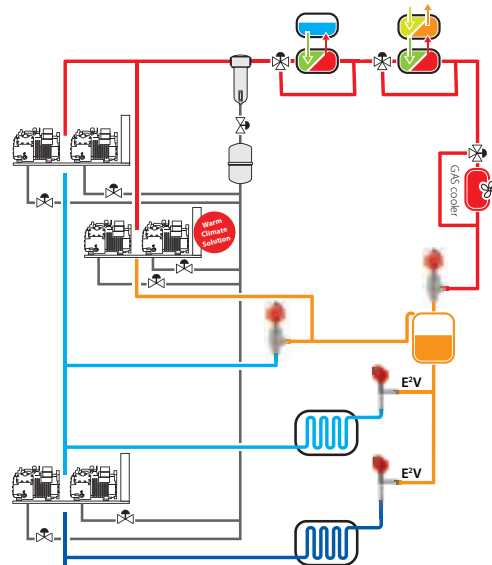
- Double line management;
- Inverter Management;
- Direct control of HPV and RPRV valves;
- Compact solution;
- Fieldbus communication;
- Supervisory integration.



High pressure valve

The E3V-C electronic expansion valve offers a complete range of capacities to suite gascooler valve and receiver valve (HPV, HPRV).

pR300T - solution for transcritical CO2 booster system



Double heat reclaim

Up to 2 heat reclaim systems management with ON/OFF or modulating device control. HPV valve and gas cooler fans coordination, integrated pump management. Gas cooler bypass as last step of heat recovery with continuous control of the by passed gas cooler outlet temperature.

Parallel compressor

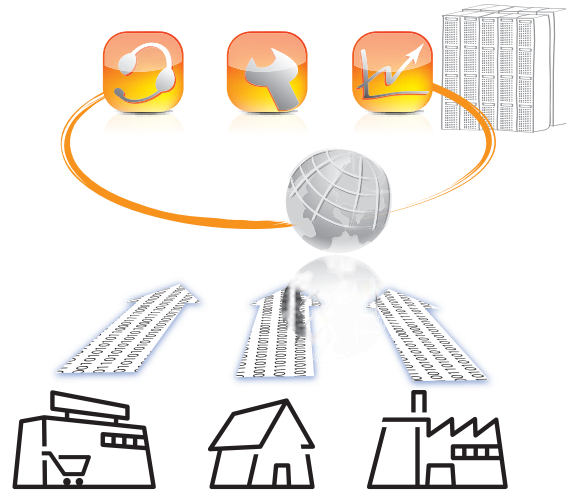
Solution for higher efficiency at high gas cooler pressure and at high outside temperature. Parallel compressor action synchronized with RPRV opening. Ready solution for warm climates.



Improve your maintenance and highlight your savings



Enterprise solution for connectivity, monitoring and remote management systems. Whatever the application, RemotePRO is the solution to check with just one click the situation on systems located in different places to be.



Commercial • Residential • Industrial

The ideal solution to monitor and optimize your sites from one single point

- manage all your stores and customers
- reduce service costs
- find top/flop configurations
- identify energy-consumptive devices
- organize raw data into readable information
- identify issues, spot trends and make better decisions quickly
- keep business users informed to make better decisions

we give you...

Maintenance optimisation

- Manage all your stores with one solution
- Add value to your service
- Avoid unnecessary costs



Energy efficiency

- Optimise your installations by finding top configurations
- Focus your investments on critical areas
- Identify high energy consuming devices



you profit by...

Analysis

- Organise raw data into readable information
- Model, process and display valuable info
- Identify issues, spot trends and make better decisions quickly



Reports

- Present data in an easy-to-read, highly interactive format
- Keep business users informed to make better decisions
- Design interactive reports for the web or mobile devices



Complete solution for monitoring and maintenance

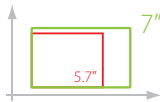


Monitoring, control and optimisation solution for: small and medium-sized supermarkets, cold rooms, restaurants chains, service stations and retrofits

Empowered

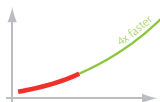
Display

- New wide touch screen 7"
- 800 x 480 WVGA
- 65.000 colours display



Performance

- New powerfull CPU
- x4 time more fast



Storage

- Up to 500 variables logged
- x5 time more storage space



Installation

- Panel version for e-box or technical mount
- Wall version for ambient / office mount



Features

User Interface

- New layout interface for a better user experience
- On board QUERTY keyboard layout



Commissioning

- Speedup commissioning phase with new line configuration
- Improve the Controllers configuration with the new broadcast feature



Trouble shooting

- Alarms display and management according to different priority
- Enhanced analysis thanks to the new Graph



Benefits

Service

- Full plant control
- Alarms notification
- Service Maintenance
- Remote web access



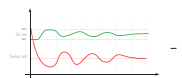
Food Quality

- Avoid waste of goods
- HACCP temperature record
- On demand or automatic temperature reports



Energy Savings

- Floating Suction Smooth Line management
- New algorithm to maximize the evaporator efficiency according to the real request of the cabinet





-14.3%

in supermarket applications energy demand

-30%

possible energy savings in the chiller applications electrical consumption

With E^V sistema CAREL offers a complete and integrated solution for controlling evaporation temperature in air-conditioning and refrigeration units, through the E^V electronic expansion valves and the new EVD evolution superheat controller. This solution is the result of decades of experience in the specific application, and thanks to the new EVD evolution driver, it integrates perfectly into the series

of CAREL controllers for the optimised management of the complete refrigeration cycle. The range of electronic expansion valves offered by CAREL covers cooling capacities up to 2000 kW, thanks to the new E^V series. All CAREL valves share the same technological solutions, from the larger sizes (E^{5V}, E^{6V}, E^{7V}) to the high-end solution for 40 kW (E^{3V} smart). Electronic valves optimise flow in the refrigerant circuit in all operating conditions. As a result, significant energy savings can be achieved by installing these valves

Energy savings

Operation at minimum possible condensing pressure means less work performed by the compressor, and a consequent reduction in energy consumption.

Easy to use

Quick start with just 4 settings, graphic display with help on the parameters, easy driver and valve installation and maintenance.

Natural refrigerants

CAREL has got the right products both on controls and ExV supporting modern refrigeration circuits based on natural refrigerants, as ammonia (R717), carbon dioxide (R744), propane (R290), butane (R600), isobutane (R600a).

ExV selection tool



Carel exvlab is the powerful tool that guides users in the selection and operation of Carel valves. This is a web-based environment where both expert designers and novices can access tools for selecting and verifying valves for all applications and operating conditions in which ExV valves can be used.

Either transcritical CO₂ and hot-gas by-pass applications are ready to be simulated.



CO₂ Ready

CAREL control systems and EXV valves can manage both subcritical and transcritical CO₂ cycles.



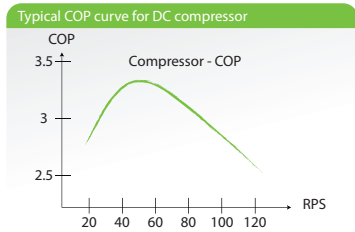
High efficiency solutions with DC Inverter technology



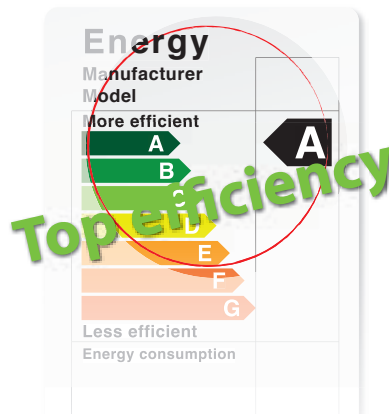
power+ is a special inverter that can control compressors with permanent magnet brushless motors (BLDC/BLAC) Integrated into CAREL controls system, it brings significant energy savings by modulating compressor speed and consequently unit cooling capacity. Variations in load are managed precisely and with constant control of the compressor envelope. This makes significant increases in unit EER/COP possible during operation at part load, giving higher energy saving.

Advantages:

- Lower power consumption with DC Inverter technology
- Improved system efficiency thanks to precise modulating load management;
- adapting temperature evaporator control to load conditions;
- Wide range of modulation (achievable from 20 rps up to 120 rps)
- Significantly increased EER/COP at part load conditions (see graph)
- More stable water temperature or air temperature control;
- Less need for defrosting thanks to higher evaporator temperature at low capacity
- Peak load management with smooth compressor modulation



The above weighting factors are defined for an average European Climate Profile and an average building load representative of residential applications.



Integrated management of DC inverter compressors and the electronic expansion valve ensures very high energy savings.

-30%



CAREL Preferred partners

The close collaboration with high level technological partners let you develop more and more innovative solutions.

UltraCella

The innovative solution for your cold rooms.



UltraCella platform - The new generation of controls for cold rooms based on latest innovative CAREL technology

Thanks to the new powerful hardware platform and innovative mechanical concept, it has been possible to develop a wide range of new controls, to fit all cold rooms needs in terms of types, features, and size.

- Up to 6 relays (compressor, defrost, evaporator fans, light and 2 auxiliary outputs for additional features);
- Up to 4 temperature probes (NTC / PT1000), humidity and pressure sensors;
- Temperature and alarm data logging (HACCP);
- Configuration through wizard, available on pGD1 Service Tool (optional);
- Easily upgradable with expansion

modules thanks to the new mechanical modular system;

- DIN rail track for fast wall mounting.

USB

Configuration export:

- after commissioning you can save parameters on USB key for your next cold room.

HACCP

Temperature and a Alarm data logging:

- user can save data easily on a USB key



Pending certification "Fitness for purpose" and world's best practice in terms of food safety



More sensing...

- up to 4 temperature probes (NTC / PT1000)
- Intelligent logic based on average measurement of 2 temperature sensors
- Humidity sensor
- Pressure sensor

More control...

- Controlling up to 2 additional features
- 2° compressor
- Pump down
- Condenser fan
- Humidification system

One platform for all your applications

You can upgrade UltraCella with additional contents thanks to the new modular system.

Ultra EVD module

- Easy assembly and connection to UltraCella granting the outstanding energy saving results of CAREL EXV.
- Including new Ultracap function and internal power transformer



Ultra Power module

- Extremely flexible system to add electric devices or additional features
- Example of:
 - Circuit Breaker
 - Additional 3HP relay for compressor



UltraCella can drive remote 3ph power modules allowing to assemble power contactors close to condensing unit and evaporator.

Ultra 3ph evaporator module

- Evaporator from 6kW to 9kW
- ExV management (optional)



Ultra 3ph full module

- Condensing unit from 4Hp to 7.5Hp
- Evaporator from 6kW to 9kW
- ExV management (optional)



Examples of possible configurations



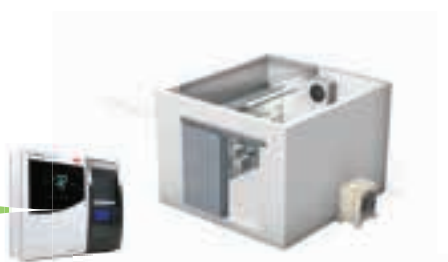
UltraCella + Ultra Power module



UltraCella + Ultra EVD module

When you need energy saving and higher performance...

+ Ultra EVD Module



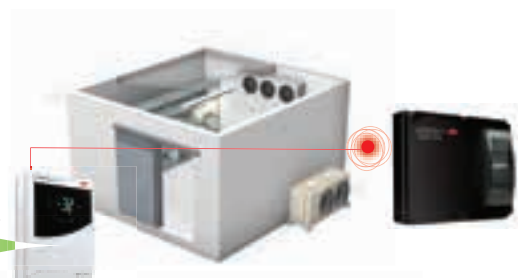
When you need additional power...

+ Ultra Power Module



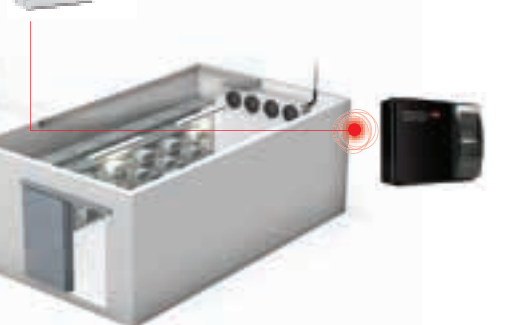
When you need 3-phase power for condensing and evaporator units...

+ 3ph Full Module



When you need 3-phase power for large remote cold rooms...

+ 3ph Evaporator Module



humiSonic Ultrasonic humidifier

humiSonic is the ideal choice for humidity control in cold rooms and precision applications. Thanks to its compact design and capacity modulation, humiSonic is easy to install and precise in meeting humidity demand. Directly driven by the CAREL cold room controller.

Efficient

humiSonic guarantees considerable energy saving when compared to common steam generators.

-90% Energy consumption

Versatile

The size of the droplets produced (average diameter of 0.005 mm) means the atomised water is quickly absorbed in the surrounding area, thus preventing possible condensation.

optimist

Energy Savings with evaporative cooling

Shopping centres, big Supermarkets, etc.



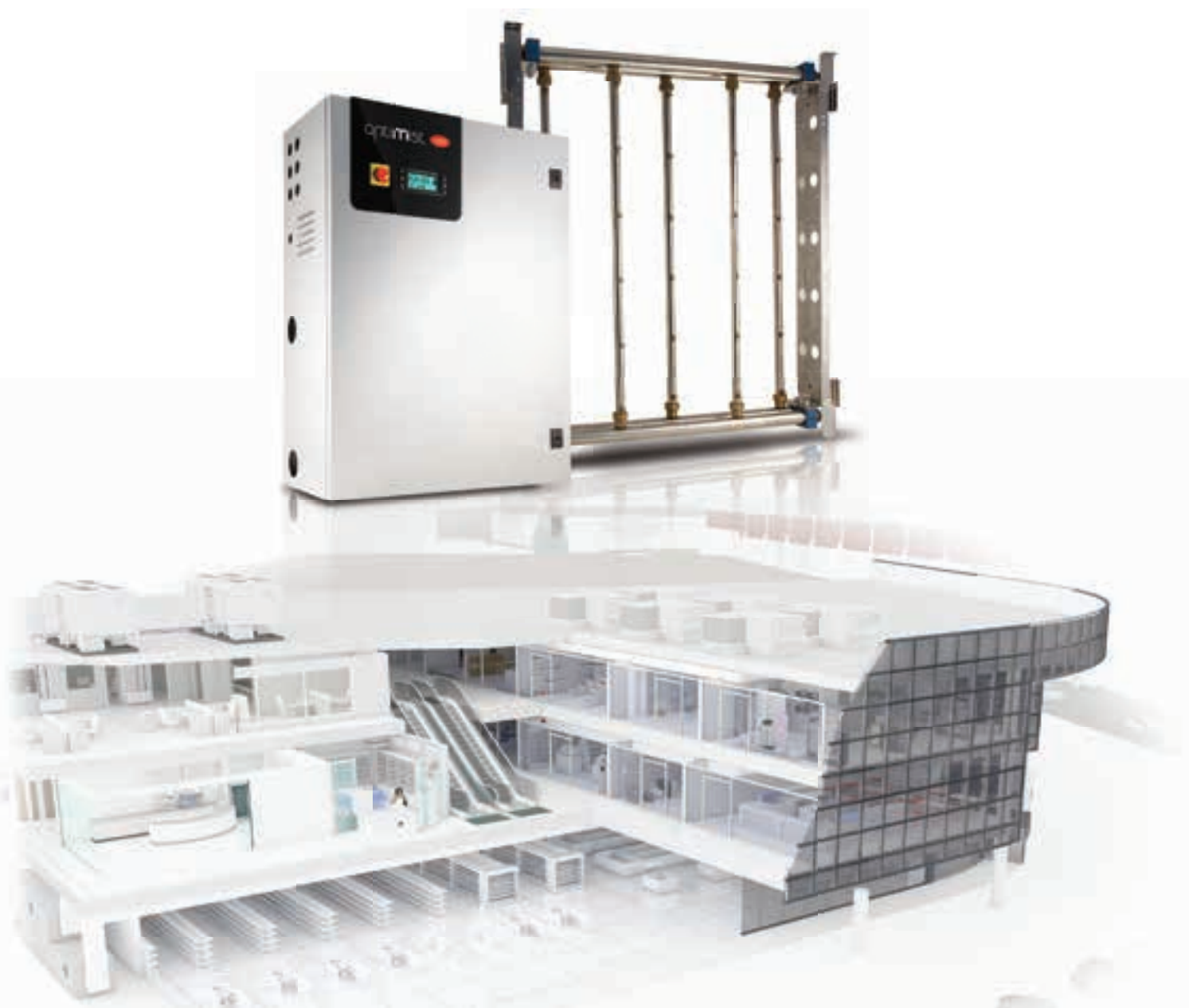
optiMist guarantees real energy savings, assuring a very low pressure drop at the fans.

optiMist is an evaporative humidifier and cooler that atomises water into very small droplets which, by evaporating spontaneously, extract heat from the humidified and cooled air. It uses an impeller pump to pressurise the water, atomising it successively through special nozzles.

The sophisticated control system combines the action of an inverter, which controls the speed and therefore pump displacement, with that of 2 solenoid valves that activate only the nozzles necessary. This allows the system to always work at the best pressure for atomising the water, within a wide flow rate range.

The cooling effect of the air is due to the spontaneous evaporation of the water droplets: the change of state from liquid to vapour takes place at the expense of the energy in the air, which cools down as a consequence.

optiMist is a complete system, which includes humidification and evaporative cooling in a unique solution, which can be used to handle air in an AHU (air handling unit), and to humidify the flow air (direct evaporative cooling) and also for indirect cooling of fresh air for example with a crossed flow recovery unit, in a way to increase energy efficiency of the AHU and reduce the running costs on HVAC systems.



High System efficiency and Best Control

power solution

Carel Power Solutions is the new Carel proposal to add value to finished products, integrating control solutions already available on the market for optimum use in the field. This ensures best customer service and maximum satisfaction, through an integrated product supplied by just one leading brand, which has always been synonymous with reliability, expertise, flexibility, innovation and service.

Refrigeration&Retail

EEV control unit, fitted with driver and backup battery module. Ideal for both retrofits and new installations.



Climate/Humidification

Remote control for CAREL humidifiers. Supplied with cables and pre-wired accessories, can be customised based on the application.



Cold rooms

Cold room controller fitted with MPXPRO and E²V electronic expansion valve. Supernode with WEB card integrated for monitoring and supervision of energy consumption via energy meter.



Compressor racks

Module for cold room management fitted with latest generation pRack controller. In addition to compressors, it controls condensers and the complete chain of safety devices. Vast series of models available for different capacity ranges.



Cabinets/retail powerBox

Compact control module for refrigerated cabinets. Modular plug&play solution that optimises and reduces installation time.



Air-conditioning

Masteraria

Control unit for air handling units with up to 2 fans, pCO₂ controller on terminal block, graphic display on door, case with IP65 degree of protection.



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.carelfrence.fr

CAREL HVAC/R Korea
www.carel.com

CAREL Iberica
www.carel.es

CAREL India
CAREL ACR Systems India (Pvt) Ltd.
www.carel.in

CAREL Nordic AB
www.carel.com

CAREL Russia
www.carelrussia.com

CAREL South Africa
CAREL Controls S.A. (Pty)
www.carelcontrols.co.za

CAREL Sud America
www.carel.com.br

CAREL U.K.
www.careluk.co.uk

CAREL U.S.A.
www.carelusa.com

Affiliates

CAREL Czech & Slovakia
CAREL spol. s.r.o.
www.carel-cz.cz

CAREL Ireland
FarrahVale Controls & Electronics Ltd.
www.carel.com

CAREL Japan Co., Ltd.
www.carel-japan.com

CAREL Korea (for retail market)
www.carel.co.kr

CAREL Mexicana S de RL de CV
www.carel.mx

CAREL Thailand
www.carel.co.th

CAREL Turkey
CFM Sogutma ve Otomasyon San. Tic. Ltd.
www.carel.com.tr