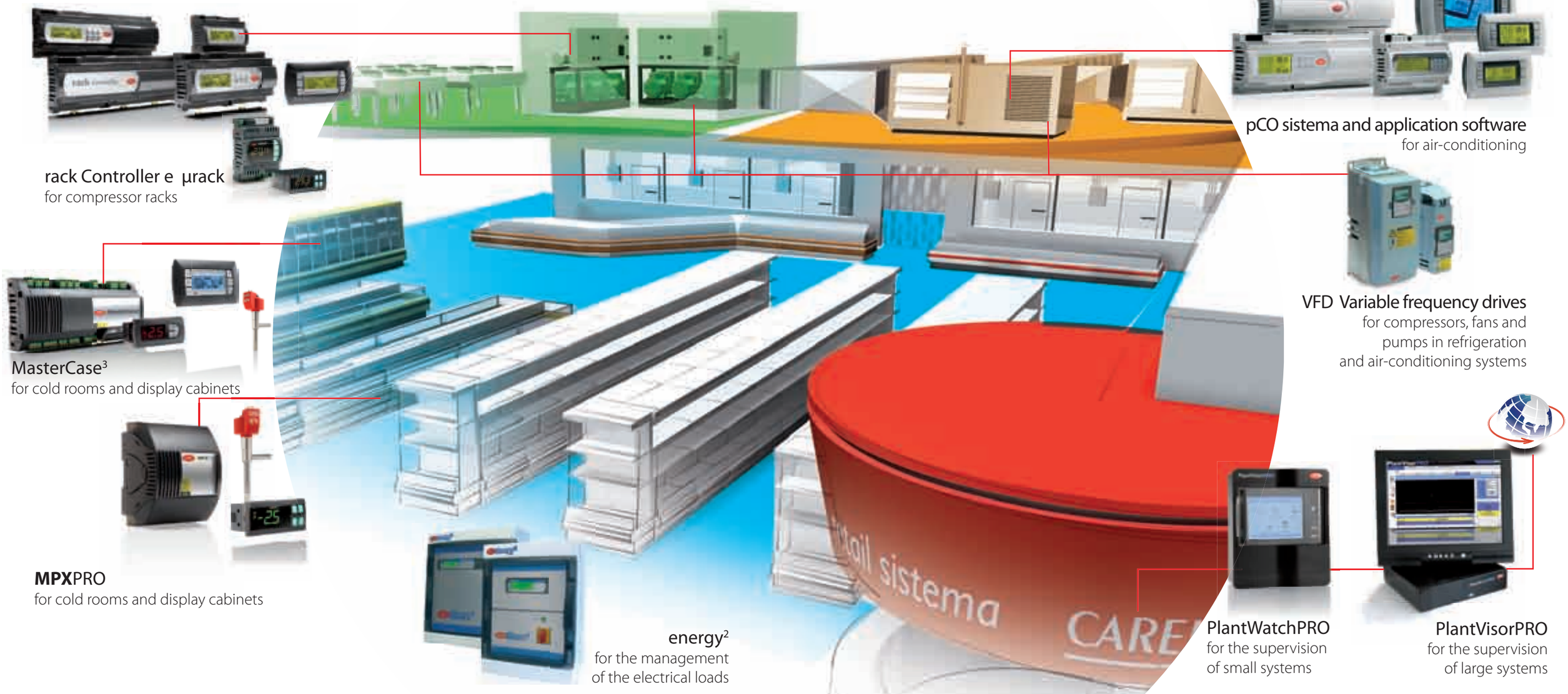
# retail sistema

## integrated solution for control and energy savings in commercial refrigeration

CAREL retail sistema
the one solution


Integrated Control Solutions & Energy Savings

# retail sistema the one solution




**rack Controller e µrack**
for compressor racks

**pCO sistema and application software**
for air-conditioning

**VFD Variable frequency drives**
for compressors, fans and pumps in refrigeration and air-conditioning systems

**MasterCase$^3$**
for cold rooms and display cabinets

**MPX**PRO
for cold rooms and display cabinets

**energy$^2$**
for the management of the electrical loads

**PlantWatchPRO**
for the supervision of small systems

**PlantVisorPRO**
for the supervision of large systems

### integration

retail sistema meets all requirements for the control, integration and supervision of food refrigeration and ambient air-conditioning systems.
retail sistema can be integrated with third-party instruments.

### energy savings

retail sistema ensures significant reductions in energy costs for refrigeration and air-conditioning.

### optimised management

retail sistema responds to the market requirements for the improvement of global system management in mass retail applications.

### alarm management

retail sistema detects and signals all alarm situations. The solutions for systems and service centers interact for efficient management of maintenance and service operations.

### standards compliance

retail sistema guarantees compliance with the safety standards on the control and management of cooling.

### reduced environmental impact

retail sistema applies solutions that ensure lower energy consumption and less polluting emissions. Moreover, customers who are more sensitive to environmental issues can reduce their carbon footprint.

# solutions for showcases and cold rooms

**MPXPRO**: series of integrated controllers for multiplexed showcases, with special focus not only on energy performance, but also on simplicity of use and installation.
MPXPRO is compatible with CAREL E2V or PWM expansion valves, and provides modulating management of the anti-sweat heaters with dewpoint monitoring. This guarantees maximum efficiency of the installation at all times.

**MasterCase3**: series of powerful and flexible controllers for cold rooms and display cabinets. These feature a high number of inputs and outputs for complete control of even more complex refrigeration units. Being compatible with the CAREL 1tool development environment and the pCO sistema options, MasterCase3 is the ideal instrument for implementing the most innovative control solutions.

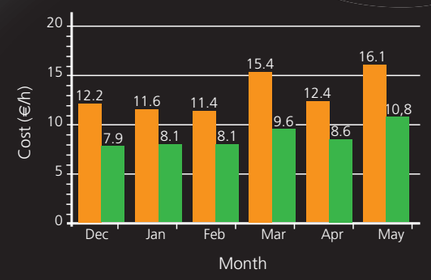
# solutions for compressor racks

**Rack Controller**: solution for the control of compressor racks designed to ensure maximum flexibility in terms of inputs and outputs, with a wide range of choices and options.
In addition, these controllers can also manage more complex compressor racks and condensers, in terms of required functions and control algorithms.

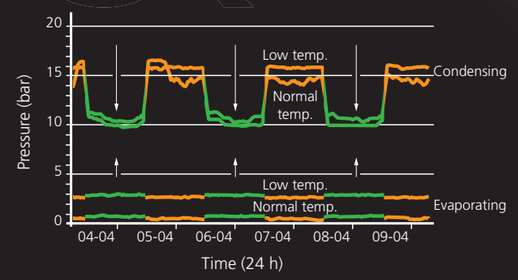
**µRack:** compact parametric controllers for the control of small compressor racks: intuitive, simple to use and install, affordably priced.
Available for DIN rail mounting or panel installation and in kits complete with accessories.

**Optimisation of refrigeration systems**
The CAREL retail sistema, being an integrated solution, maximises the advantages in terms of energy saving available on the various refrigeration system controllers.
Optimisation is made possible by system integration and the constant search for the best possible operating conditions. In the context of the refrigeration system as a whole, this ensures energy savings and solutions that guarantee environmentally compatible development.

# -30%
## energy consumption*




operation with electronic valve




operation with mechanical valve

* The data are cumulative, relating to the optimisation of the compressor rack with floating condensing and evaporation pressure, the use of E2V valves and control of the anti-sweat heaters with temperature and humidity monitoring. Part of the data (floating condensing pressure control with E2V valves) are the result of the analysis and case study conducted by CAREL, backed by CNR (Italian National Research Council) and presented during the international conference entitled "Energy performance of different expansion valves in a supermarket" (Vicenza, 2005).

**$CO_2$ in refrigeration systems**
The interest surrounding the use of carbon dioxide ($CO_2$, R744) in refrigeration systems derives from the need to reduce environmental pollution, especially as regards the formation of the hole in the ozone layer and the increase in the greenhouse effect. The importance of these aspects is also a result of more than 160 countries signing up to "Kyoto Protocol", an international treaty on environmental protection.

# solutions for air-conditioning

**solutions for air-conditioning and ambient cooling**: retail sistema exploits CAREL's thirty-year experience in the development of control solutions for air-conditioning units, based on water chillers, air handling units (AHU) and compact units with on-board compressors (rooftop).

# solutions for roof-top units, compressors and fans

**VFD**: series of variable frequency drives that allow compressor operating speed to be controlled by inverter. The use of the VFD guarantees the correct flow of refrigerant inside the circuit, meaning the compressor can operate continuously and bringing benefits in terms of cooling efficiency and energy savings.

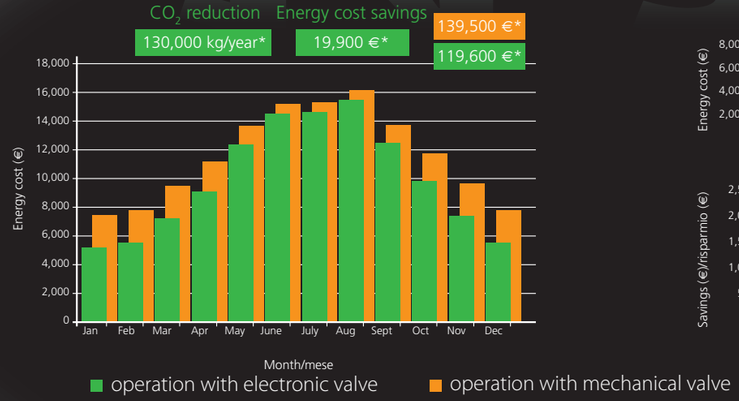
# monitoring and management of electrical loads

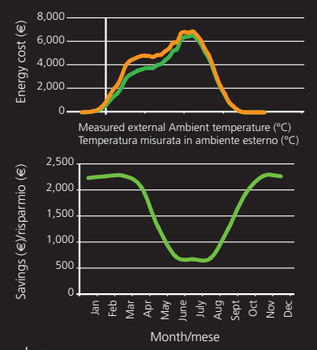
**Energy2 and energy monitoring**: series of panel-mounted microprocessor controllers especially designed to acquire data on energy consumption from multiple points in a system and consequently manage the electrical loads. The control action involves deactivating certain loads (managed for the required period of time) based on set priorities and time bands. In addition, the most commonly-used third-party instruments for reading and counting energy consumption can be integrated into the system (in multiple points).

## Optimisation of air-conditioning systems

Growing energy costs and the implementation of the "Kyoto protocol" have led to increased demand for environmentally-compatible air-conditioning systems, including applications for the mass retail sector. In such systems, the use of integrated solutions with expansion electronic valves and inverters guarantees considerable energy savings. This is proven by research and case studies on CAREL applications for air-conditioning and air cooling in particularly delicate environments.

# -14.3% energy consumption*




*Measurements carried out in a telephone exchange air-conditioned using 6 dual-circuit chillers on R22 with a maximum capacity of 900 kW

# supervision and telemaintenance

**Centralised management of alarms and maintenance**: concerning technical alarms, maintenance and the remote availability of the data acquired. CAREL supervised systems can be either stand-alone (sending information independently) or integrated into a monitoring network (managed from one remote control center).

**Energy savings, optimisation and monitoring of installation performance**: specific functions for increasing the efficiency of the installation and analysing any deviations from optimum operation.

**Secure access and connectivity via WEB**: possibility to connect the systems to the central control unit, via a simple and secure "point-to-point" connection or the Internet.

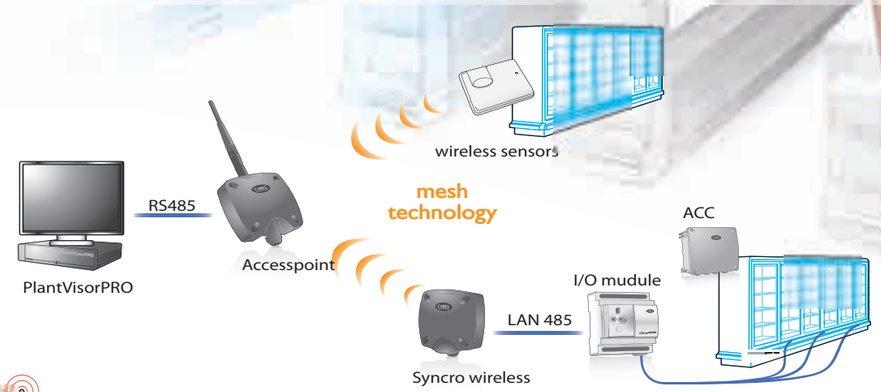
**Flexible and cutting-edge solutions for connectivity and communication**: several technical solutions are available for connecting to the installation or the remote control center, or directly to the service network.

**Centralised programming of system lights and unit operation**: weekly scheduler with management of annual public holidays for the correct and efficient management of the lighting, both on the refrigeration utilities and other lights.





# retrofit solutions




CAREL **retrofit solutions** are designed based on highly technological products with the aim of ensuring an integrated solution. The main products making up such solutions are:

- PlantVisorPRO/PlantWatchPRO
- Synchro Wireless (data transmission/reception in master/slave mode),
- Wireless sensors (temperature sensors without wiring),
- I/O modules (acquisition of the main operating parameters on each individual refrigeration utility),
- ACC (anti-sweat controllers).

Installation is low-impact: wiring is limited, exploiting wireless technology and maintaining the control already installed on the refrigeration utilities.


SMS ←
e-mail ←
fax ←
HTTP ←

**PlantWatchPRO**: PC-free solution for monitoring small-medium systems. The LCD colour touchscreen displays all the information in a simple and immediate manner.

→ SMS
→ e-mail
→ fax
→ HTTP

**PlantVisorPRO**: solution for the supervision of large areas with a high number of utilities. Includes an intuitive and effective navigation interface with cutting-edge features.

*“we recognise environmental issues as a high corporate priority”*

*Francesco Nalini*
*Managing Director, CAREL Group*

**Research and development to protect the environment**

Innovation and technological progress have marked the development and success of CAREL. Advanced research into new products and integration solutions - conducted in the CAREL laboratories - guarantee system optimisation and energy savings.

Around 7% of consolidated sales in 2007 was allocated to innovation and technological progress aimed at supporting environmentally-compatible development. Over 20% of personnel are employed in the R&D of new products and market standards.

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