

# CAREL

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## Solutions for compressor racks



the one solution


T e c h n o l o g y & E v o l u t i o n

# Solutions for compressor racks



The compressor rack is the most important and complex electromechanical device in the refrigeration system: this delivers cooling for the foodstuffs to all the refrigeration utilities and the related processing rooms.





Each manufacturer adapts their products to requirements in terms of performance and costs, and consequently the CAREL retail sistema has been designed to be flexible and customised.

We can provide OEMs and installers a complete line that matches the results of their design efforts, maximising the results.

From varying numbers of simple hermetic compressors to variable load or inverter controlled semi-hermetic and hermetic compressors.

The CAREL retail sistema has a solution for all applications.

In terms of energy saving, the compressor rack has a wide range of operation, as the installed power is very significant: all our solutions have been designed with the focus on this aspect, with the aim of minimising electricity consumption.

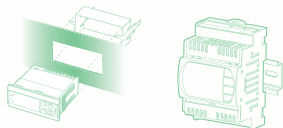
The use of E<sup>2</sup>V proportional electronic expansion valves in the refrigeration utilities at the point of sale exploits the maximum advantages of the energy saving functions in the compressor rack controller.

# μRack

compactness, simplicity and efficiency



With the μRack series, the CAREL Retail sistema offers a series of compact and economical parametric controllers. These units are simple to use and install, for the complete control of small compressor racks.

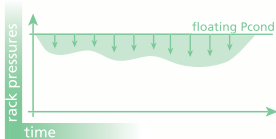


Available in DIN rail format or for panel installation and with a complete kit of accessories.



High efficiency LED display to show the values monitored. Clearly visible icons represent the unit operating status and any faults.

Modulating condenser fan speed control using the PWM output.



Operation with floating condensing pressure control to increase the efficiency and the performance of the compressor racks.



Three levels of access to display and program the parameters: (user, installer, manufacturer), with possibility the reassign the parameters to different levels.

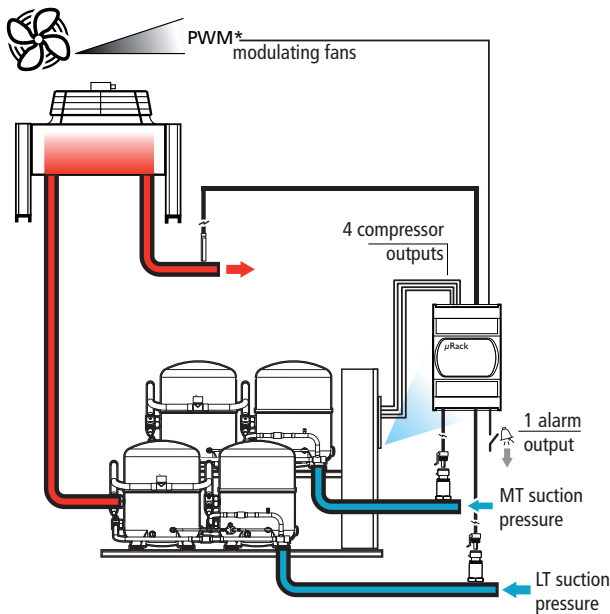
μRack

# diagrams and configurations

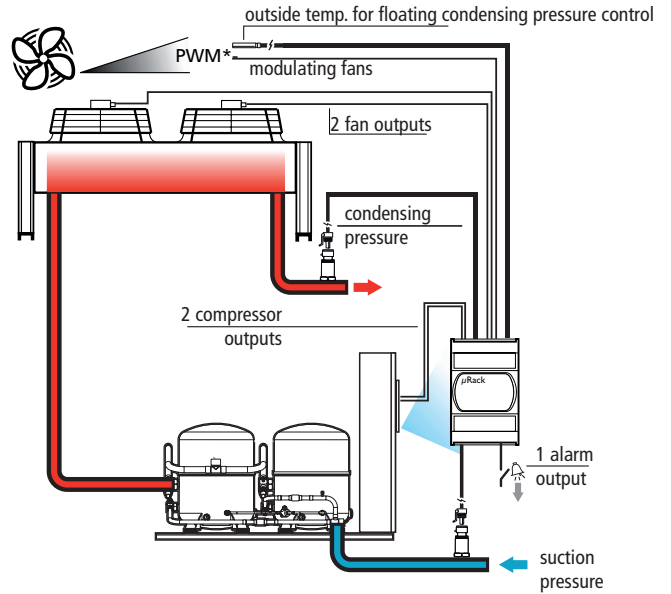
## Maximum configuration

- 4 digital outputs for the control of compressors and fans;
- 1 PWM output for the speed\* control of condenser fans;
- 3 analogue inputs for reading pressure and temperature probes;
- 1 alarm output.

### Example of double suction line



### Example of single suction line



\* requires the special option

## accessories



**FCS**  
three-phase speed controllers, IP55  
With the PWM output, μRack can control three-phase or single-phase speed regulators.



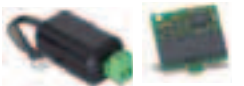
**Output signal converters**  
μRack can be connected to the ON/OFF board for fan control and the PWM signal conversion module, using the 0 to 10 V and 4 to 20 mA analogue output.



**Key option**  
Used to copy the settings and the operating parameters between devices, between the key and the device, and vice-versa.



**Connector kit**  
Connector kits are available for the μRack panel version (MCH2CON001) and DIN rail version (MCH2CON011).



**RS485 serial**  
Used to interface μRack to an RS485 supervisory network. The codes vary depending on the installation (panel or DIN rail).

## product codes

MRK0000000	μRack panel installation 32x74, 24 Vac
MRK00000D0	μRack DIN rail assembly, 24 Vac
MRK0000AD0	μRack DIN rail assembly with RS485 serial board option, 24 Vac
MRK00010DK	μRack DIN KIT: MRK00000D0+ transformer TRADR1W024+ pressure transducers (SPKT0053R0+SPKT0033R0) + connection cables SPKC002310 (2 pcs.)
MRK000200K	μRack PANEL KIT: as for MRK00010DK but with MRK0000000
MRK00030DK	μRack DIN KIT with connector kit: as for MRK00010DK but with MRK00000D0 and MCHSMLCAB2 connector kit
MRK000400K	μRack PANEL KIT with connector kit: as for MRK00010DK but with MRK0000000 and MCHSMLCAB2 connector kit

# Rack controller

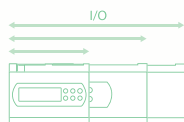
power and control without compromise



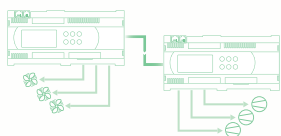
rack controller

Rack controller is a line of controllers designed for the more complex and advanced systems.

The availability of inputs and outputs covers the requirements of the most sophisticated compressor racks in terms of the number and the function of the required control algorithms.



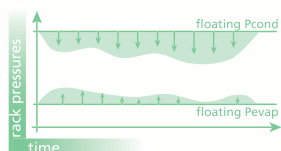
The control software in six languages, compatible with the different sizes of hardware, satisfies both the most common control requirements as well as the more advanced applications.



Possibility to separate compressor and fan control on one single user interface, with local network connection between the controllers. Drastic reduction in the cost of electrical connections to remote fans.



Modulating capacity control using special inverter outputs for the compressors and/or inverter/phase control outputs for the condenser fans.



Operation with floating condensing and evaporation\* pressure to increase the efficiency and the performance of the compressor racks.

\* requires a compatible CAREL supervision software.

# diagrams and configurations

## Maximum configuration

(depends on the size and the type of hardware used)

### Compressor control

- compressors with the same capacity (without capacity control);
- 8 compressors with the same capacity (max. 3 capacity-control steps, max. 4 compressor outputs);
- 6 compres. with different capacities (without capacity control);
- 1 modulating 0 to 10 V output for inverter control;
- 3 compressor alarm inputs.

### Fan control

- 16 fans;
- 1 modulating 0 to 10 V output for inverter control;
- 1 modulating PWM output for phase control.

## Configuration examples

### pCO<sup>XS</sup> (5 relays):

- 2 compressors; 2 fans; 1 alarm;
- 3 compressors; 2 fans.

### pCO<sup>3</sup> small (8 relays):

- 4 compressors; 4 fans;
- 3 compressors; 4 fans; 1 alarm.

### pCO<sup>3</sup> medium (13 relays):

- 4 compressors; 1 compressor capacity control; 4 fans;
- 1 alarm;
- 6 compressors; 6 fans; 1 alarm.

### pCO<sup>3</sup> large (18 relays):

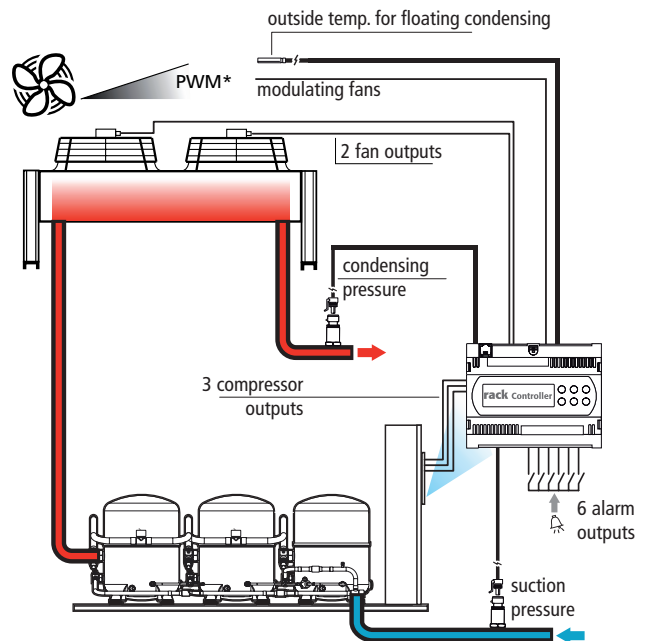
- 5 compressors; 1 compressor capacity control; 6 fans;
- 1 alarm;
- 6 compressors; 1 compressor capacity control; 5 fans;
- 1 alarm.

## Compatible hardware features\*

description	pCO <sup>XS</sup>	pCO <sup>3</sup> small	pCO <sup>3</sup> medium	pCO <sup>3</sup> large
digital outputs	5	8	13	18
analogue outputs	3	4	4	6
analogue inputs	4	5	8	10
digital inputs	6	8	14	18

\*I/O refer to the HW available not to the standard SW. See the Rack controller application manual for the configurations that are managed by the SW and the selection of the most suitable HW for your needs.

## Example of the pCO<sup>XS</sup> kit



\* requires the special option

## accessories



### FieldBus or BMS modem board

The RS232 option can be used to interface to a PSTN or GSM modem, allowing remote control and the send/receive SMS message function (GSM only), or alternatively connection to a serial printer.



### Ethernet™ interface board

BACnet™ Ethernet™, IP, SNMP V1, 2, 3, FTP and HTTP.

## product codes

PCO3CF091K	pCO <sup>3</sup> Small and PGD0000I00 terminal (replaces kit PCO2CF5I0K)
PCO3CF081K	pCO <sup>3</sup> Small and PGD0000F00 terminal (replaces kit PCO2CF5T0K)
PCO3CF071K	pCO <sup>3</sup> Small with built-in terminal (replaces kit PCO2CF0B50)
PCO3CF061K	pCO <sup>3</sup> Medium and PGD000F00 terminal (replaces kit PCO2CF061K)
PCO3CF051K	pCO <sup>3</sup> Medium with built-in terminal (replaces kit PCO2CF051K)
PCO3CF031K	pCO <sup>3</sup> Large with built-in terminal (replaces kit PCO2CF031K)
PCO3CF021K	pCO <sup>3</sup> Large and PGD0000I00 terminal (replaces kit PCO2CF021K)
PCO3CF011K	pCO <sup>3</sup> Large and PGD0000F00 terminal (replaces kit PCO2CF011K)
PCO1CF0BXK	pCO <sup>XS</sup> with built-in terminal
PCO1CF0AXK	pCO <sup>XS</sup> and PGD0000F00 terminal

**Note:** all the codes shown above include the standard compressor rack software (code FLSTDMFC0A vers. 1.8 or higher), screw connector kit, installation manual and connection cable to the external terminal S90CONN001 (3 m) where featured.

## Headquarters

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