



programmable controllers

pCO Sistema: pCO

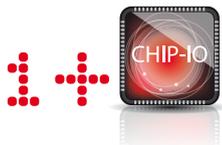


pCO⁵⁺

Programmable controller for
HVAC/R applications

The 5 pluses of the pCO⁵+

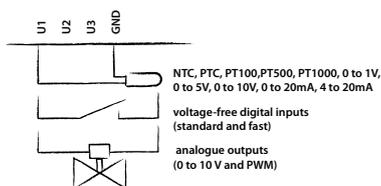
pCO⁵+: one response to the multiple current and future demands of the HVAC/R market



Flexibility

Up to 10 universal channels, each configurable as an input or output:

- NTC, PTC, PT100, PT500, PT1000 probe, 0/1V, 0/5V, 0/10V, 0/20 mA, or 4/20 mA,
- voltage-free digital input (standard and fast)
- analogue output (0/10V and PWM).



Carel has developed a proprietary chip using ASIC technology (Application-Specific Integrated Circuit), ensuring greater system flexibility as manufacturers can use the same size board for different applications.

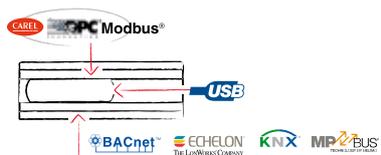
The Carel ASIC increases the resolution of analogue inputs for more accurate calculations, for example when converting refrigerant temperature, imperial/metric readings, seasonal performance factor (SPF) and coefficient of performance (COP)...

pCO⁵+ comes in 10 different sizes, guaranteeing an excellent solution for all HVAC/R applications.



Connectivity

Up to 7 communication ports available, with the most commonly-used protocols in HVAC/R applications, for complete system management: pLAN, 1 BMS1, BMS2, FieldBus1, FieldBus2, USB host, USB device.



pLAN:

RS485 multi-master communication port to connect terminals and manage distributed intelligence

BMS:

One RS485 BMS port, always included as standard, also available in the optically-isolated version; this can be configured with CAREL and Modbus RTU protocols. A vast range of optional cards - which can also be installed during commissioning rather than in the factory - is available to interface with the most commonly-used communication standards, such as Modbus® (RTU and TCP/IP), BACnet™ (MS/TP and IP), SNMP, LonWorks®, Konnex® and Johnson METASYS®.

Fieldbus:

One RS485 FB port, always included as standard, also available in the optically-isolated version; this can be configured with CAREL and Modbus RTU protocols. This standard port can be used to manage smart actuators, such as inverters, EC fans, variable flow-rate pumps, etc. without requiring an additional card. A vast range of optional cards - which can also be installed during commissioning rather than in the factory - is available to interface with the most commonly-used field bus standards.



USB:

USB "Host" and "Device" ports for communication with standard USB pendrives or direct connection to a PC for programming and commissioning without requiring serial converters.





Energy saving

Up to 2 integrated EVDEVO drivers for managing two Independent E^V electronic expansion valves, meaning less wiring and space occupied. The Ultracap module can also be installed without increasing the physical dimensions of the pCO⁵⁺; this module guarantees the valves close in the event of power failures, eliminating the need for the solenoid valve that would otherwise be needed to close the circuit.



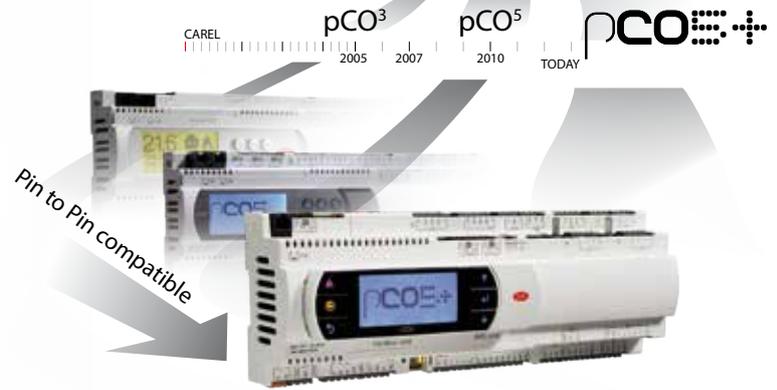
Cloud based

Possibility to perform actions via web, such as read and write unit variables, update the application on the board, and Webserver to browse custom HTML pages, send emails.



Backward compatibility

pCO⁵⁺ is compatible with the two previous generations of the pCO family: pCO⁵ and pCO³. pCO⁵⁺ includes a BIOS that emulates the functions of the pCO³ and pCO⁵, thus allowing manufacturers who currently use pCO³ or pCO⁵ to replace these with a pCO⁵⁺, reusing the exact same software without needing to edit or recompile.



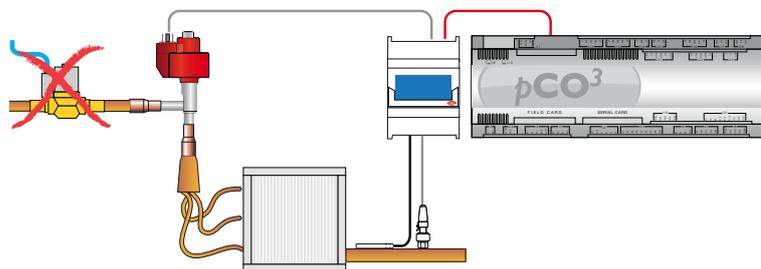
The Ultracap module, exploiting ELDC (Electric Double Layer Capacitor) technology, represents a fast, reliable and environmentally-friendly solution for closing the electronic expansion valve in the event of power failures.

Fast: emergency closing is completed quickly and is guaranteed in all conditions. Following emergency closing, when the capacitors are completely discharged, the Ultracap module takes just 5 minutes to recharge and become operative again (in practice, this is the same delay for restarting a compressor after a blackout).

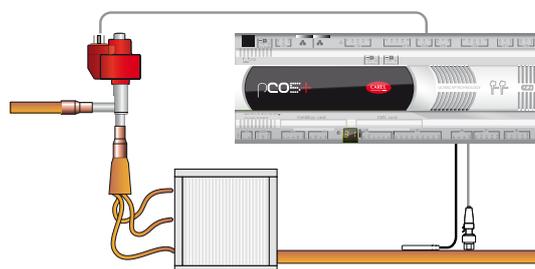
Reliable: Ultracap has been designed to ensure 10 years' operation, without needing periodical checks or battery replacement, at a very competitive price.

Environmentally-friendly: a lower environmental impact than lead battery systems, both in terms of construction and waste disposal requirements

Solution with pCO³, external EVD EVO driver and solenoid valve

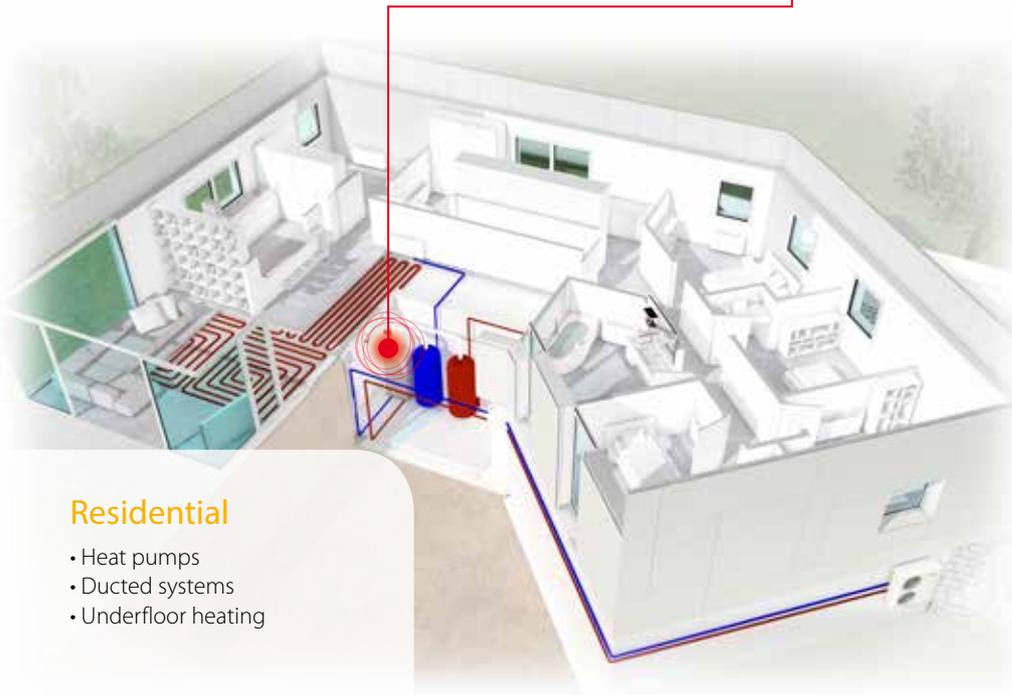


Solution with pCO⁵⁺, integrated EVD EVO driver and Ultracap module



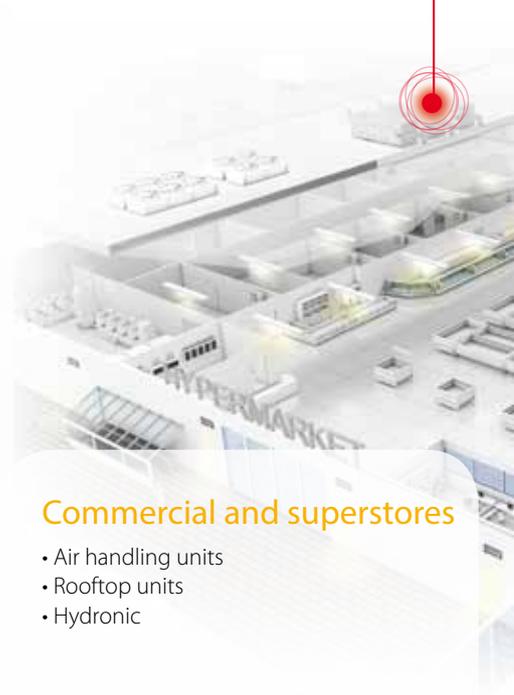
Flexibility

The most versatile programmable controller in the HVAC/R sector for residential and commercial applications and data centers.



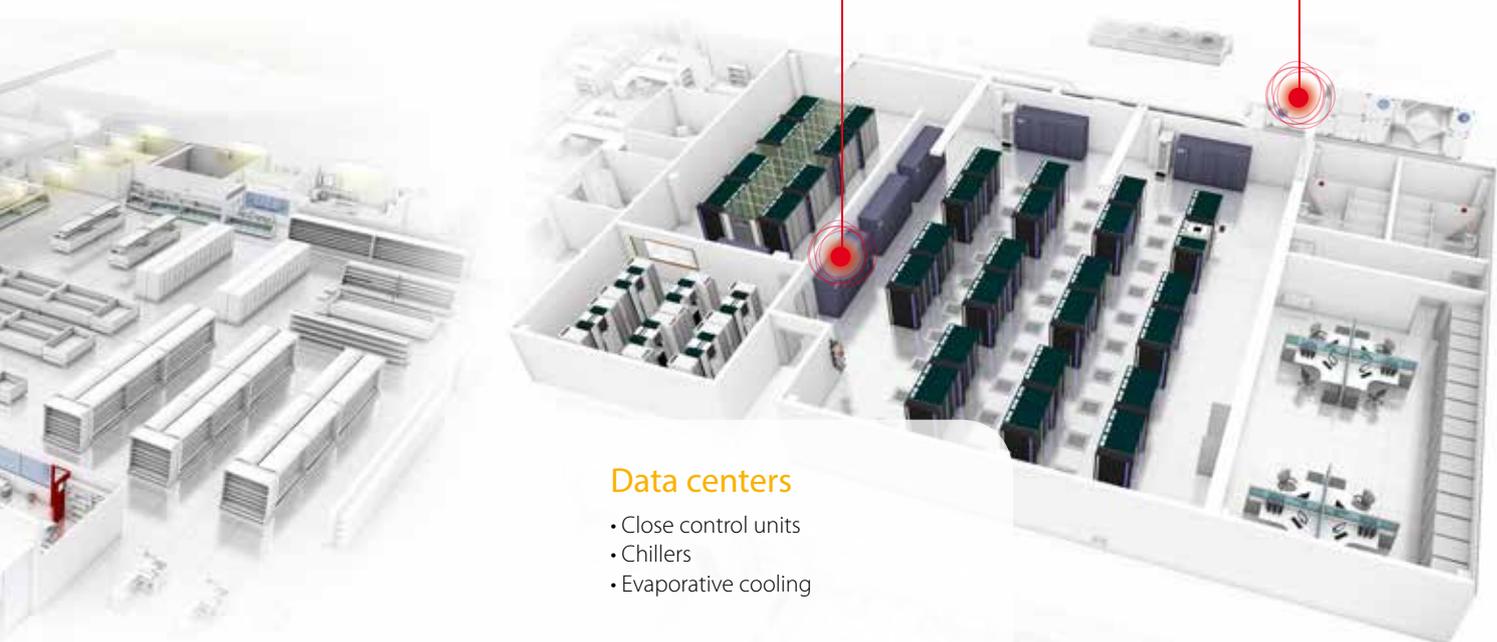
Residential

- Heat pumps
- Ducted systems
- Underfloor heating



Commercial and superstores

- Air handling units
- Rooftop units
- Hydronic



Data centers

- Close control units
- Chillers
- Evaporative cooling

Range and accessories



pCO⁵ Compact

the pCO solution with 6 DIN modules and 19 I/Os



pCO^e expansion card

Used to increase the number of I/Os on the pCO while keeping costs and overall dimensions under control.



pCO⁵+ Small

the pCO solution with 13 DIN modules and 24 I/Os



pCO⁵+ Medium

the pCO solution with 18 DIN modules and 40 I/Os



Electronic expansion valve driver

To control CAREL or third party E^V valves.



pCO⁵+ Medium con EVD EVO

the pCO solution with 18 DIN modules and 44 I/Os



Ultracap (stand-alone & plug-in)

To guarantee closing of the electronic valve in the event of blackouts.



pCO⁵+ Large

the pCO solution with 18 DIN modules and 48 I/Os



pCO⁵+ Extralarge

the pCO solution with 18 DIN modules and 58 I/Os

Serial cards

Used to interface pCO controllers with the most common communication standards



MP-BUS[®] card



Konnex cCard



tLAN serial card



Ethernet[™] interface card



BACnet[™] interface card



CANbus serial card



LonWorks[®] serial card

Terminals





One single development suite for designing the complete application, from control of the unit to interaction with the environment.

Completely programmable TFT touch screen displays

The new CAREL range of displays are all programmable using 1tool. This allows the development of simple, intuitive and attractive interfaces for end users. The range of TFT touch screen displays can combine different colours and transparency levels using Alpha Blending technology.

Specific libraries for HVAC/R applications

CAREL's know-how, acquired in more than 35 years' specific experience in the HVAC/R sector, is made available in a complete library of functions, from the simplest to the most complex, all ready to use.

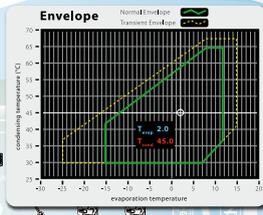
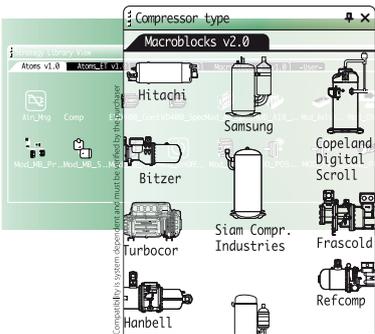
Compressor Manufacturer Approved: readily available technology

The partnerships between CAREL and the leading international compressor manufacturers guarantee high quality control solutions and optimum compressor management throughout the life of the unit.



1tool HVAC/R library

Software drivers for the fastest implementation, the best performance, the highest reliability, the longest life of your compressors.



COMPRESSOR MANUFACTURERS APPROVED



All trademarks hereby referenced are the property of their respective owners.

Table of pCO sistema models

Features	Compact		Small	Medium		Large	Extralarge
	PCOX*A	PCOX*B	P+5*S	P+5*M	P+5* + EVD EVO	P+5*L	P+5*XL
Maximum flash memory capacity	4 MB		13 MB				
NAND flash	32 MB		50 MB				
Real Time Clock				●			
pLAN port				●			
tLAN port	●					□	
Integrated FieldBus port				●			
Integrated BMS port						●	
Ready for FieldBus card						●	
Ready for BMS card				●			
USB programming key				□			
Built-in pGD ¹ display				□			
Black box				●			
Max no. of analogue inputs	8	6	5	8	12	10	8
PT1000 inputs	2	2	5	8	8	10	8
PT500 inputs			5	8	8	10	8
PT100 inputs			2	3	3	4	3
PTC inputs			5	8	8	10	8
NTC inputs	8	6	5	8	10	10	8
0 to 10 Vdc inputs	4	4	5	8	11	10	8
0 to 1 Vdc inputs	6	6	5	8	10	10	8
4 to 20 mA or 0 to 20 mA inputs with power supply from pCO	2	2	4	6	8	6	6
4 to 20 mA or 0 to 20 mA inputs with external power supply	2	2	4	7	9	9	7
0 to 5 Vdc ratiometric inputs with power supply from pCO	4	4	5	6	8	6	6
0 to 5 Vdc ratiometric inputs with external power supply	4	4	5	8	10	10	10
Max no. of digital inputs	6	4	13	22	22	28	22
24 Vac/Vdc inputs			8	14	14	18	14
230 Vac/Vdc inputs				2	2	4	2
Voltage-free contact inputs	6	4	5	8	8	10	8
Fast digital inputs	1	1	2	4	4	6	4
Max no. of analogue outputs	2	4	9	12	12	14	12
Optically-isolated 0 to 10 Vdc outputs			4	4	4	6	4
0 to 10 Vdc outputs	1	3	5	8	8	10	8
Optically-isolated PWM outputs			2	2	2	2	2
PWM outputs	1	1	5	8	8	10	8
Max no. of digital outputs	7	6	8	13	13	18	29
SPST relay outputs	5	4	7	10	10	13	26
SPDT relay outputs	2	2	1	3	3	5	3
Max no. of SSR outputs	2	4	1	2	2	3/4	2
48 Vdc power supply	●	●					

● standard - □ optional

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