

Press release

ELECTRONIC VALVES AND DC INVERTERS: CAREL'S PRODUCTS FOR HIGH-EFFICIENCY APPLICATIONS IN THE HVAC/R SECTOR

The benefits of the "heart" of CAREL's high-efficiency solutions: energy saving, high reliability, optimum control and return on investment in less than a year

Brugine (Padova), 15 March 2016

In the last 15 years Carel has introduced numerous control systems for refrigeration and air-conditioning units and systems onto the market. Many of these are based on two technologies whose value is now widely consolidated: electronic expansion valves and inverters for DC compressors.

Both of these components have the purpose of optimising refrigeration unit operation. Their benefits? Power consumption reduced by up to 40%, fine temperature control and constant control and optimisation of operating conditions to maximise compressor reliability and performance.

ExV electronic expansion valves

The ExV family valves, together with their control systems, represent the first example in the world of using sophisticated stepper motor technology in refrigeration applications.

CAREL has scaled down the size, capacity and price of technology that was already used in medium and high capacity air-conditioning systems (hundreds of kW). The result is the introduction of a reliable high-tech product into a market dominated by mechanical expansion systems. Compared to the latter, ExV valves provide fine control and optimisation of evaporator operation and lower superheat, prevent temperature swings, reach steady operation much faster, and above all bring enormous benefits in terms of maximising efficiency. Tests conducted in the field have demonstrated how **energy savings of 30%** can be obtained when compared to traditional mechanical expansion systems, with a **return on investment of less than one year**. To certify the scientific authenticity of its measurement methods, CAREL has partnered important organisations, such as the CNR (Italian Research Council) and the University of Padova, as well as major international supermarket chains.

Finally, it is worth mentioning the air-conditioning market again: in these applications, the ExV family offers the widest range of stepper valves in terms of cooling capacity, from 1 to more than 2000 W, with the reliability of each model guaranteed for over one billion steps. The most significant features include perfect tightness for protecting the compressor, a closing time of 3.2 seconds and optimised resolution according to the control position, thanks to the equipercentile profile designed for variable-capacity systems (fine control at low refrigerant flow-rates and high reactivity at high flow-rates).

Power Plus inverters for DC compressors

Compressors with permanent magnet motors controlled by DC inverters are one of the most efficient technologies available in the world for HVAC/R applications. This technology, originating from Japan, is becoming the market standard in home air-conditioning and heating applications. For almost 10 years, CAREL has been helping to disseminate this technology in both refrigeration and air-conditioning applications, especially the most energy-hungry of these, such as heat pumps, air-conditioners for data centers, condensing units and refrigerated showcases. The results are astonishing: energy savings of up to 40% thanks to the capacity to adapt to cooling demand in real time, with minimum power consumption. All of this would not be possible however without the Power Plus family of inverters, the only devices available on the market

that can control more than 80 different models of DC compressors, made by the world's leading manufacturers, with cooling capacities up to 50kW. That's not all, when combined with the pCO and c.pCO series controllers, the CAREL system integrates the compressor's electrical and thermodynamic characteristics, and is engineered based on in-depth lab tests conducted in collaboration with the compressor manufacturers. Maximum efficiency and total reliability are further guaranteed by dynamic control of the compressor envelope, the area in which correct operation is guaranteed.

CAREL's experience in this sector has allowed the Power Plus to be upgraded with exclusive functions to protect the compressor and optimise the entire refrigeration system: the new Power plus integrates "class B" safety software that allows customers to certify the unit in accordance with international safety standards, without requiring additional components. The "crankcase heater" function maintains a compressor crankcase temperature that prevents the oil from freezing, without requiring an actual heating element in the crankcase.

The entire CAREL control system is integrated into the final application, for example a heat pump, so as to ensure the technology meets the needs of the end user.

press information

CAREL Media Relations Manager, Paola De Troia

T. +39 049 9731 899

media.relations@carel.com

About CAREL

CAREL is one of the world leaders in control solutions for air-conditioning, refrigeration and heating, and systems for humidification and evaporative cooling. Our products are designed to bring energy saving and reduce the environmental impact of equipment and systems. Our solutions are used in commercial, industrial and residential applications. CAREL has 19 fully-owned subsidiaries and 7 production sites, as well as partners and distributors in a further 75 countries.

For further information, go to www.carel.com