

An integrated technical strategy for commercial refrigeration

Complete packages for OEMs and contractors, with a focus on natural refrigerants and application-oriented development: Sanhua's 2025-2030 roadmap signals a paradigm shift in the commercial refrigeration industry

With the acceleration of European regulations on the F-gas front (EU 2024/573) and the uncertainties related to the future of HFOs (subject to possible restrictions by ECHA), Sanhua has defined a new strategy that focuses on two main guidelines: natural refrigerants and integrated component packages. Our goal is to become a trusted technical partner for OEMs and contractors in commercial refrigeration.

Why focus on natural refrigerants

Sanhua's strategic choice to invest in natural refrigerants, in particular R290 and CO₂, responds to a combination of regulatory, technical and market factors. Federico Bisco, Technical Director of Sanhua Europe, explains:

"On the one hand, the new European F-gas regulation and the uncertainties related to the possible ban of HFOs containing PFAS push towards stable solutions without regulatory risks. On the other hand, the demand of the

European market – especially in commercial refrigeration – is increasingly oriented towards environmentally friendly technologies, also for reasons of image and perceived sustainability. In this context, Sanhua offers complete packages optimized for natural refrigerants, helping OEMs accelerate the transition and stand out with compliant, reliable, and future-proof solutions."



Complete product packages for R290

Sanhua is already able to cover more than 90% of the components needed for propane plug-in applications. The offer includes filters, solenoid valves, TXV, EEV, exchangers, taps, sensors, electronic controllers, inverters and thermostats. The entire range is certified according to PED and CEI EN 60335 standards, including EN 60730-2-89 for

electrical safety. The adoption of propane as a standardized solution in refrigerated plug-ins has led to an explosion in demand in Europe. Sanhua responded by structuring a complete range, with products optimized for performance and cost. Package integration allows OEMs to reduce the bill of materials and facilitate system approval.

Waterloops and mini power plants: evolving solutions

In the R290 waterloop segment, Sanhua offers scalable packages with three configurations: **Basic** (with mechanical valve), **Smart** (with electronic valve and sensors) and **Plus** (with inverter and digital controller). Electronics are continuously evolving to improve compatibility with key European protocols such as Carel, Dixell, and Danfoss. These solutions are aimed at proximity stores, convenience stores and retrofits of existing systems, where compactness

and flexibility are crucial. Thanks to the high integration of the packages, the installer can reduce commissioning time and costs. In the mini-rack and CO₂ booster units segment up to 40 kW, the company is expanding its offer to include all critical components: PEVs, smart sensors, heat exchangers, controllers and safety valves. The CO₂ range is expected to be completed by the end of 2026, with the aim of also covering applications up to 100 kW in transcritical racks.

CO₂ condensing unit: focus on the sub-40 kW segment

Demo CU powered by Sanhua "Today," says Bisco, "the main challenge is to make CO₂ condensing units competitive with HFO solutions. Costs remain 2-3 times higher, but increased volumes and standardized designs are expected to narrow the gap." Sanhua already offers key components for these applications: electronic "PEV" valves with PWM modulation, microchannel and brazed heat exchangers, electronic

controllers developed with European partners, temperature and pressure sensors, and effectively reversible bi-flow ball valves. In particular, PEV stands out for its increased control stability even under conditions of rapid change in heat load. It is a viable solution for replacing established electronic valves such as AKVP, with the advantage of a more competitive cost and better sealing at high pressures.



Focused innovation on every component

But how to enter a market where there are already established names and which in some sectors have started well in advance of Sanhua?

Bisco answers: "We try to take advantage of the advantage of the newcomer: being able to identify the critical points of existing products and intervene in a targeted way, bringing products to the market that can solve these critical issues."

For example? "Our future CO₂ ball valves have been designed to integrate a service valve instead of a Schrader valve loading access in order to have an increased passage section

that avoids the risk of dry ice formation. Some models of CO₂ ball valves will integrate a check valve, while the series for trans-critical applications will have a patented design aimed at the true bidirectionality of the product; these valves will adopt a ball without a hole typically used during pump down to remove the gas trapped in the ball itself. The goal is to simplify installation and reduce the possibility of technical error by installers while maintaining the very high safety standards of the product even in the event of an accidental increase in internal pressure."



Towards a CO₂-ready and digitized future

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A collaborative business model

Sanhua does not intend to position itself as a system manufacturer, but as a strategic supplier of components. The commercial approach is based on a "product package" offer that provides more favorable conditions for those who adopt integrated solutions. This allows OEMs to:

- Reduce development and certification times;
- Simplify logistical and technical management;
- Increase the standardization of its products.

In addition, the company provides pre- and post-sales technical support, including assistance in configuring and validating packages for specific customer needs.

With a modular model and a well-established presence across key segments, Sanhua positions itself as a driving force in the HVAC-R industry's transition toward a sustainable and high-performance future.