onShow

CAREL

REFRIGERANTS

DIGITALISATION

ENERGY PERFORMANCE

Discover our world,
experience our solutions,
be part of it!

The adoption of natural refrigerants is crucial for achieving global climate goals

DRIVEN BY THE FUTURE

Sustainability in action

CAREL has developed technologies that optimise their use, ensuring high performance in both industrial and residential settings. At the event, the Group presents cutting-edge solutions for sustainable cold chain management, components for heat pumps in compliance with new F-GAS regulations, and solutions for high-temperature heat pumps and process chillers that facilitate industrial decarbonisation through the adoption of **low environmental impact refrigerants.**

A central theme of the participation at Chillventa is **digitalisation,** which is transforming how HVAC/R systems are monitored, controlled, and managed. CAREL showcases advanced solutions integrated with AI technologies that enable centralised and intuitive system management, improving energy efficiency and ensuring compliance with environmental regulations. Digitalisation not only enhances performance but also significantly simplifies interaction with systems, making monitoring and remote maintenance easier. This approach significantly reduces learning times and facilitates anomaly diagnosis, allowing installers to save valuable time. Finally, continuous support provided by centralised control solutions facilitates integrated management and performance improvement of retail outlets, reducing inefficiencies and increasing sustainability.

Energy efficiency is equally crucial in the commercial sector. For refrigeration solutions, CAREL has developed advanced components that optimise compressor usage, allowing reduced energy consumption without sacrificing cooling capacity. Additionally, ventilation management in buildings for industrial, residential and commercial solutions integrate heat recovery systems, which enhance energy efficiency while ensuring high indoor air quality.

A3 READY SOLUTIONS

The coming into force of the new F-GAS regulations, together with European and global decarbonisation targets, make the use of low GWP refrigerants such as propane essential

In response to these challenges, CAREL offers complete solutions for residential and industrial heat pumps, with components designed to optimise the use of these refrigerants, thus improving energy efficiency and reducing environmental impact.

One of CAREL's main strengths is its ability to develop advanced "A3 ready" solutions, which **guarantee both safety and high performance** even in applications that use flammable refrigerants, simplifying both production and certification of the units for manufacturers. The new products to be presented at Chillventa include the **three-phase inverter with integrated active filter,** which improves the performance of variable-speed compressors, as well as the hermetic electronic expansion valve, designed to manage refrigerant temperatures up to 100°C. This technology guarantees high precision and reliability in all operating conditions, responding to the latest, stricter EMC regulations.

DECARBONISE INDUSTRY WITH HIGH EFFICIENCY SYSTEMS

In response to environmental challenges, CAREL presents the new **µChiller Process**, an innovative solution for process chillers that is compatible with low GWP gases, guaranteeing efficiency, safety and compliance with the latest regulations. The small but important contribution that the Group wants to make to support the fight against climate change comes from our continuous research into advanced solutions for precise temperature and humidity control, integrating heat recovery to reduce energy consumption in different production sectors. Highly-efficient technologies and services for installation and maintenance support aim to **reduce environmental impact and improve production capacity**, with solutions proposed by the CAREL ecosystem: Recuperator, Enginia, CRC, Klingenburg, HygroMatik.

Targeted investments are needed to optimise industrial systems by reducing environmental impact and constantly improving production capacity. The aim is to ensure both a rapid return on investment and minimise operating and maintenance costs.

CAREL offers two innovative technologies for saving energy in industrial processes: **high-efficiency heat recovery for process air flows, and high-pressure adiabatic atomisation** for humidity control and evaporative cooling of industrial environments.

DISCOVER THE NEW PROGRAMMING LANDMARK

watch the video

The world of programming is experiencing an unprecedented revolution, driven by constant evolution of the technologies and skills required. In the dynamic landscape of HVAC/R unit programming, it is essential to be able to develop the unit logic efficiently, quickly and reliably. STone in fact offers a concrete and advanced solution **to accelerate the development process, while ensuring software quality and efficiency.** One of STone's strengths is its integration with the best technologies available today.

sTone Virtual Loop

The **digital twin technology** in STone replicates a real system's operating conditions, allowing engineers to test logic and interfaces in a safe, simulated environment before field implementation. This reduces the risk of errors, improves product quality, and accelerates development. By enabling rapid testing and debugging without physical prototypes, it also cuts field testing costs.

AI technology

STone integrates artificial intelligence (AI) to simplify and optimise code development. Key features include automatic code generation, which reduces programming complexity and human error, and code optimisation, where AI algorithms suggest improvements for greater efficiency and performance. Additionally, STone offers HVAC/R software text translation, streamlining adaptation to global markets.

sTone Simula

STone Simula is a user-friendly application by CAREL that allows developers to **simulate HVAC algorithms and user interfaces** without needing physical systems. Ideal for users with limited software knowledge, it faithfully replicates system behaviour, making it useful for training installers, after-sales support, and enhancing compatibility across devices.

Last but not least, the STone development platform is compatible with the wide range of CAREL programmable controllers. This means that programmers can develop logic that can be used **across a wide range of HVAC/R devices,** thus optimising the investment made into the software. STone is not just a tool, but rather a partner that offers flexibility and optimisation of investments over the long term.

ONE PARTNER TO MAKE AHUs BETTER

The European Green Deal has defined a very clear path to decarbonisation

with buildings playing a crucial role and HVAC systems representing the main area where action can be taken to achieve this objective.

In commercial buildings, together with energy saving, indoor air quality and healthy indoor environments are also essential. The solutions for rooftops, air handling units and heat recovery units fit perfectly into this scenario. **Recuperator's EXSTREAM** heat recovery unit ensures high efficiency and low pressure drop in compact spaces, making it ideal for indirect evaporative cooling. Adiabatic humidification is represented by **humiFog**, a humidifier with low energy consumption and compliant with the hygiene standards defined by VDI6022, as well as the **µAria and k.AIR** ready-to-use control solutions for managing the systems with the highest performance. Renovating existing buildings and promoting sustainable building practices means implementing indoor air quality and energy management systems for precise and optimised energy management. CAREL offers the **RED optimise** platform for cloud services, designed for the control and monitoring of HVAC/R systems. This solution simplifies management of centralised cumulative data, with the aim of maximising energy efficiency.

HYGROMATIK®

CAREL's HygroMatik product line - a group company since 2018 - includes the **FlexLine** range of steam humidifiers designed to guarantee long life and limited maintenance in commercial and industrial applications. With both **adiabatic and isothermal humidification solutions,** CAREL provides a complete range of humidity control solutions, in compliance with European hygiene standards, for all sectors that require air temperature-humidity without compromising on environmental sustainability.

ENHANCED ENERGY PERFORMANCE IN FOOD RETAIL

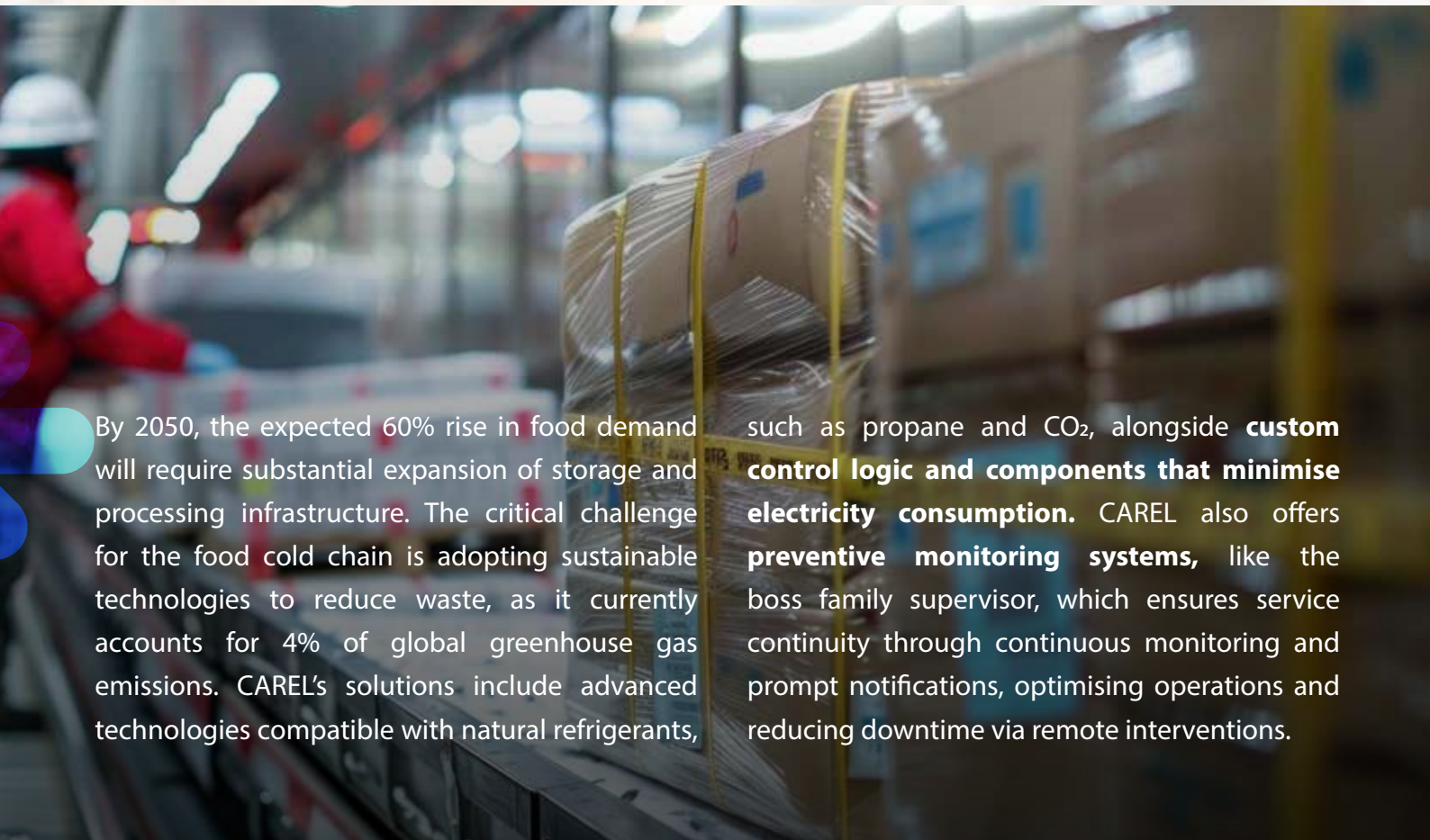
Commercial and industrial refrigeration account for 17% of global electricity consumption

The adoption of technologies that optimise performance and reduce energy consumption become more and more essential. CAREL presents a range of solutions designed to **maximise energy efficiency and improve sustainability in food retail, food service, and cold chain applications.**

Refrigeration consumes the second largest expense for supermarkets, and reducing energy consumption helps both the environment and lowers operational costs.

The electricity consumption of the refrigerated cabinets that display fresh, pre-cooked or frozen products can be reduced by minimising the loss of cooling towards the outside and increasing the efficiency of refrigeration systems.

The former generally involves improving the insulation around the cabinet, for example by increasing the quality and/or thickness of the cavities between the internal and external layers and using insulated glass doors for access to the goods. For the latter, on the other hand, the tendency is to use increasingly efficient components, coupled with increasingly optimised algorithms for managing the refrigeration cycle (cooling production and distribution, defrosting), in order to deliver the same cooling capacity using less energy. At Chillventa 2024, CAREL will showcase several innovations, including **HeosPro controller with propane compressors,** and the upgraded **µRack CO_2 controller for transcritical condensing units.** Additionally, CAREL will introduce a new ejector management device for CO_2 systems to maximise energy efficiency.



By 2050, the expected 60% rise in food demand will require substantial expansion of storage and processing infrastructure. The critical challenge for the food cold chain is adopting sustainable technologies to reduce waste, as it currently accounts for 4% of global greenhouse gas emissions. CAREL's solutions include advanced technologies compatible with natural refrigerants, such as propane and CO_2, alongside **custom control logic and components that minimise electricity consumption.** CAREL also offers **preventive monitoring systems,** like the boss family supervisor, which ensures service continuity through continuous monitoring and prompt notifications, optimising operations and reducing downtime via remote interventions.

A KEY DEVICE AND FULLY INTEGRATED REFRIGERATION SYSTEM

The food retail sector is rapidly evolving, driven by the need for increased energy efficiency and reduced environmental impact. Alongside these trends, the integration of AI, big data, and cybersecurity has become essential to improve automation, precision, and security. CAREL's **new MPXPRO,** developed from its successful previous generation, meets these demands with a focus on **energy efficiency, food preservation, and safety.**

MPXPRO, part of a complete product range including MPXzero and MPXone, supports various refrigeration systems such as plug-in units, remote cabinets, and cold rooms. It features a user-friendly interface across the range, ensuring scalability and ease of use. The compact 6 DIN module design reduces installation time and costs, offering seamless integration into electrical panels.

Enhanced energy monitoring allows for comparative analysis of consumption and temperature control, benefiting OEMs, installers, and end users. With NFC and Bluetooth® standard in the entire range, the **APPLICA app simplifies control via smartphones and tablets.** MPXPRO also features advanced connectivity for easy integration into building automation systems, making it a key solution for modern food retail refrigeration.

THE ONE-STOP-SHOP FLEXIBLE SOLUTION FOR FOOD RETAIL AND FOOD SERVICE

Total-Store is an integrated solution designed to manage **refrigeration, HVAC and lighting technologies,** optimising energy consumption in both new builds and retrofits of existing stores. Through centralised, remote management of all areas of energy consumption, the system brings significant reductions in operating costs and better control

GET READY FOR YOUR NEXT INSTALLATION!

Training resources and in-field tools for installers and wholesalers

In today's fast-paced world, digitalisation has become essential for both home and work environments, allowing us to quickly adapt to new technologies and make better decisions. For refrigeration technicians, **this means easier installation and maintenance through digital tools** like configuration apps. One such example is CAREL's APPLICA app, which streamlines complex processes by providing interactive, multilingual information. Technicians can follow configuration wizards, access logs, and save configurations for multiple devices, greatly reducing the learning curve.

The **boss local supervisor** offers another layer of convenience, enabling 24/7 monitoring of cold rooms via a single access point. It can also send remote alerts and reports through email or Telegram. Furthermore, **sensors like the GLD are optimised through the RILEVA-TE app** for easy commissioning and calibration.

CAREL TOOLS

Scan & bookmark!

CAREL also supports technicians with a free online learning portal, offering on-demand training videos and tutorials to address specific field issues. This digital approach saves time, enhances efficiency, and empowers technicians to be well-prepared for any task.

of energy efficiency. Moreover, integration with the **RED optimise** multi-site platform further improves energy performance management and increases optimisation capabilities. RED optimise provides a detailed and comparative overview of the performance of connected stores, **identifying any inefficiencies and suggesting improvement strategies.** The platform can be used to monitor and log data in real time, facilitating the implementation of corrective actions and optimisations. These can also be performed via remote, improving service continuity and significantly reducing energy and maintenance costs.

RED optimise

Headquarters

CAREL INDUSTRIES HQs
Via dell'Industria, 11
35020 Brugine - Padova (Italy)
carel@carel.com

+300176EN - 30_02.10.2024

CAREL

To the best of CAREL INDUSTRIES S.p.A. knowledge and belief, the information contained herein is accurate and reliable as of the date of publication. However, CAREL INDUSTRIES S.p.A. does not assume any liability whatsoever for the accuracy and completeness of the information presented without guarantee or responsibility of any kind and makes no representation or warranty, either expressed or implied. A number of factors may affect the performance of any products used in conjunction with user's materials all of which must be taken into account by the user in producing or using the products. The user should not assume that all necessary data for the proper evaluation of these products are contained herein and is responsible for the appropriate, safe and legal use, processing and handling of CAREL's products. The Information provided herein does not relieve the user from the responsibility of carrying out its own tests and the user assumes all risks and liabilities related to the use of the products and/or information contained herein. © 2023 CAREL INDUSTRIES S.p.A. All rights reserved.