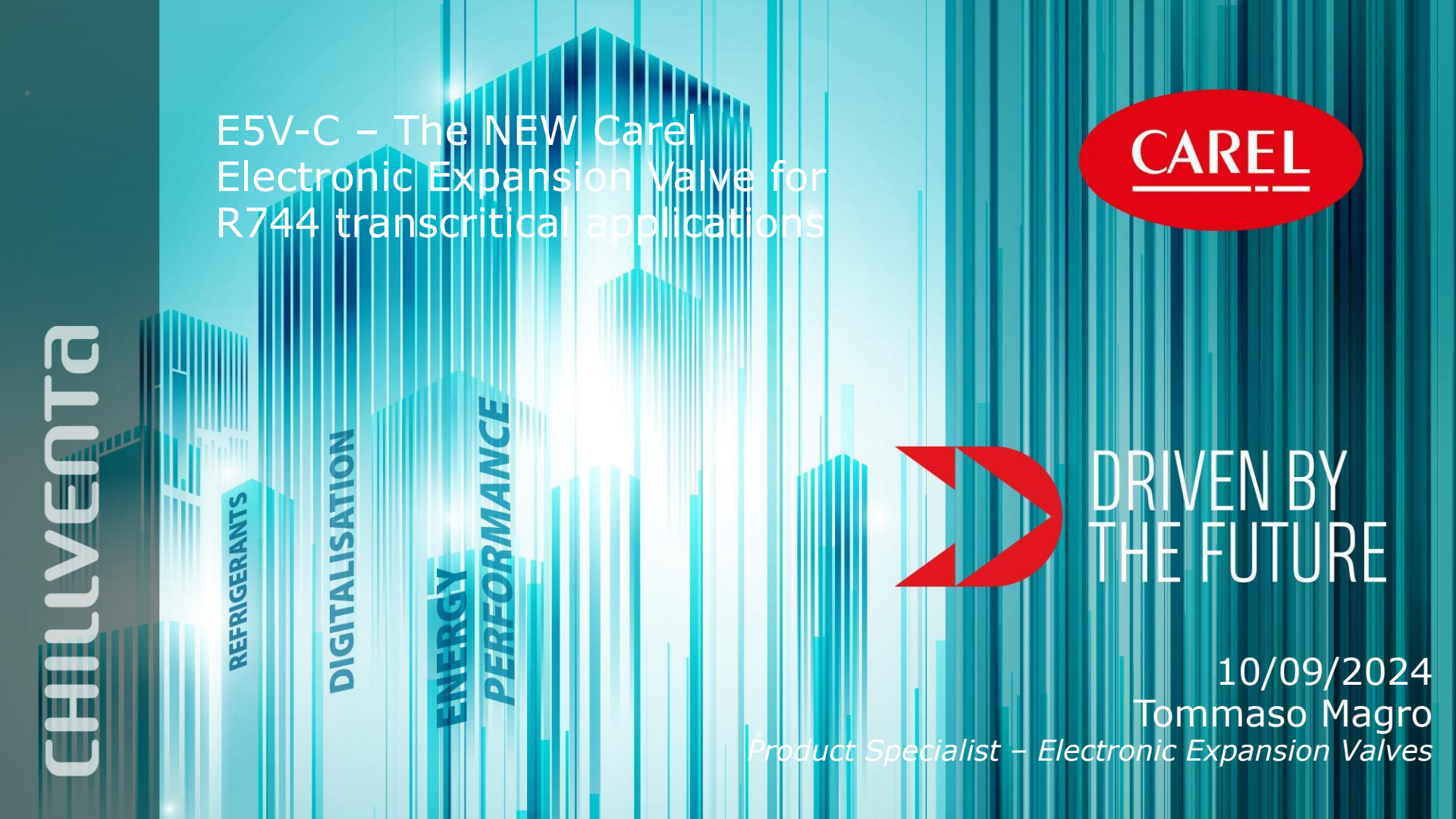
Hall 7A

Chillventa Specialist Forums 2024
Chillventa Fachforen 2024

CONNECTING EXPERTS.

E5V-C – The NEW Carel Electronic Expansion Valve for R744 transcritical applications



10/09/2024
Tommaso Magro
Product Specialist – Electronic Expansion Valves

Purpose of the presentation

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Introduce the E5V-C electronic expansion valve and its role in R744 systems

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Key Topics:

- ExV-C Carel valves range
- E5V-C pillars
- Integration of E5V-C with other Carel components

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- Integration of E5V-C with other Carel components

Objective:

To demonstrate how the E5V-C enhances system performance and aligns with industry trends towards sustainability and efficiency.

ExV-C - The Carel lineup for R744

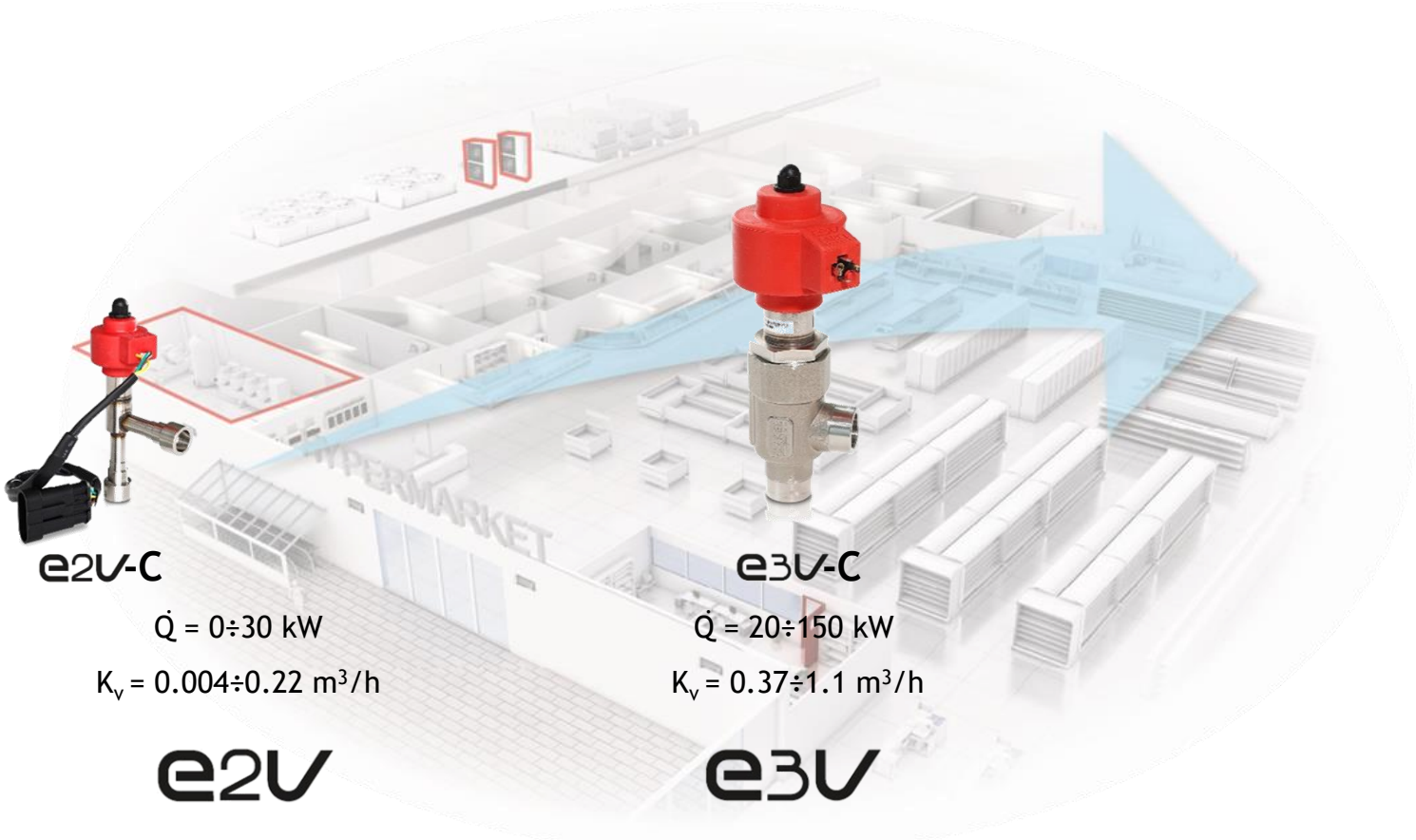
e2V-C

$\dot{Q}$ = 0÷30 kW

K_v = 0.004÷0.22 m^3/h

e2V

ExV-C - The Carel lineup for R744



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e3V-C

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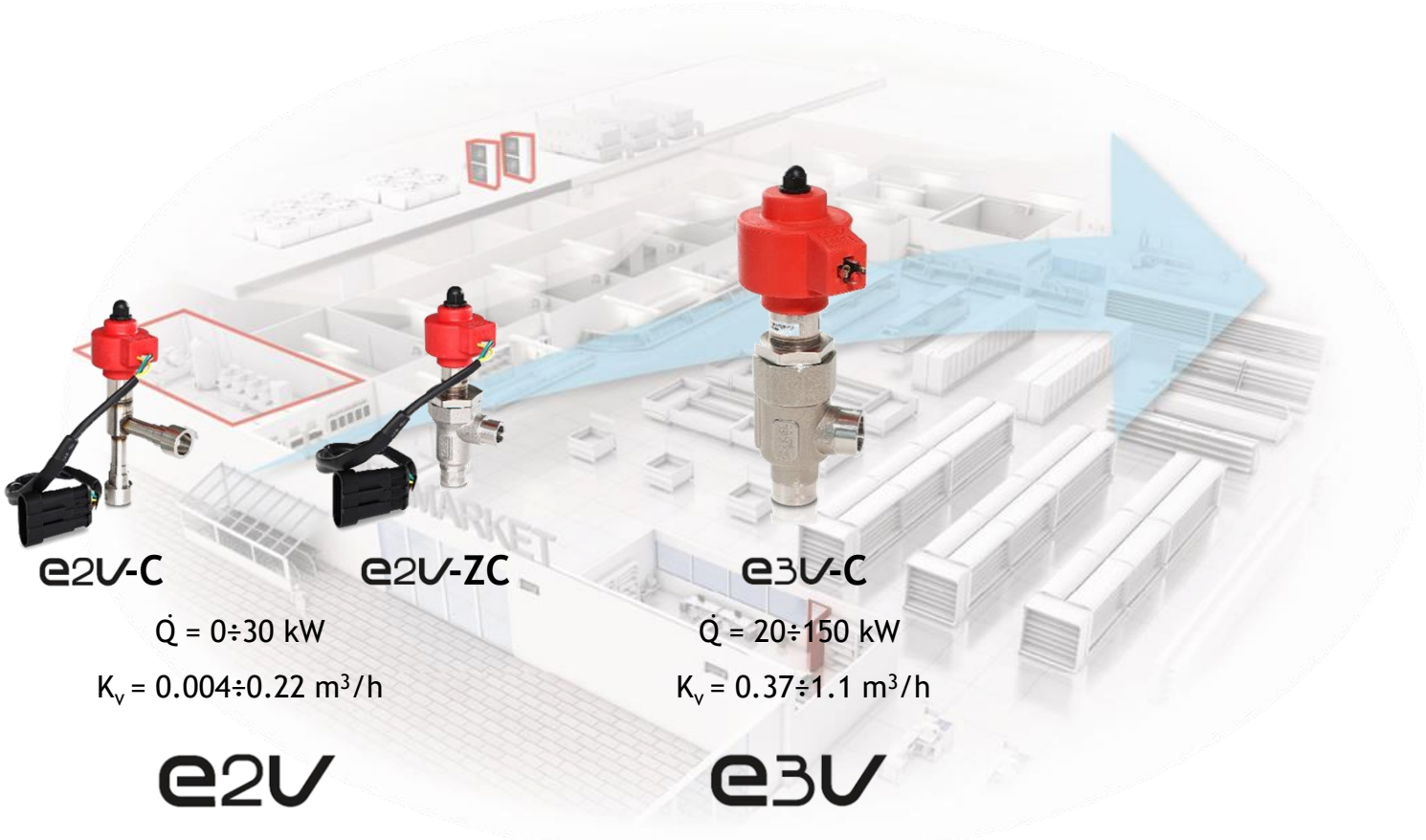

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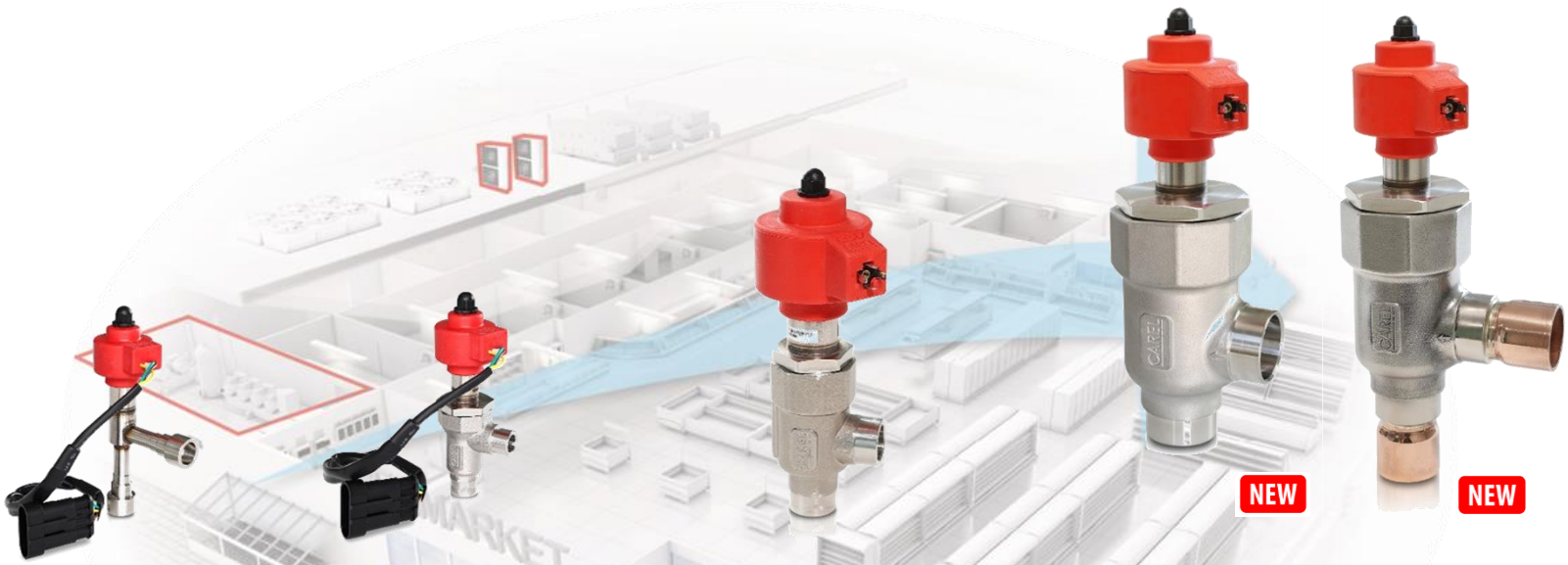

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e5V-C

$\dot{Q}$ = 100÷600 kW

K_v = 1.6÷4.2 m^3/h

e2V e3V e5V

ExV-C - The Carel lineup for R744

- maximize the offering through a **complete package of solutions**, from electronic control (µRack CO_2/pRack300T) to valves for managing the transcritical part (ExV-C)
- follow the **growing trend of adopting R744** as a refrigerant due to environmental, regulatory, and economic factors, alongside its inherent efficiency and versatility in refrigeration applications

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e2V e3V e5V

E5V-C pillars

Semi-hermetic design

Semi-hermetic design for easy installation and maintenance.
The unique valve body can accommodate cartridges of all sizes.

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Structural & fluid dynamic simulations

To ensure the functionality and performance of the product, across the entire range of use.

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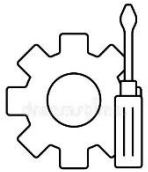
To ensure the functionality and performance of the product, across the entire range of use.

High performance materials

Valve body made of stainless steel, to guarantee typical R744 pressures.

E5V-C pillars

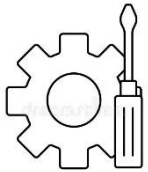


EASE OF INSTALLATION

Faster and simpler installation

Easy handling due to reduced weight.
Availability of K65 copper fittings version, to simplify the installation.

E5V-C pillars



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Cleanable mechanical filter that provides high protection against debris.

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Precise control of refrigerant flow rate

Fine control at a low flow rate.
Equi-percentual regulation ensures the highest precision that each specific flow regime requires.

E5V-C pillars

Fully modulating

Capable of modulating the refrigerant flow according to the thermal requirements of the system, ensuring continuous and variable control

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Backup ultracapacitor to close the valve

This energy backup device provides temporary power to ensure the proper functioning of critical systems in the event of a power failure, ensuring that they can shut down properly and safely.

E5V-C pillars

- Maximum Working Pressure (MWP) = **140 barg** (2030 PSIg)
- Maximum Differential Working Pressure (MOPD) = **90 bar** (1305 PSI)

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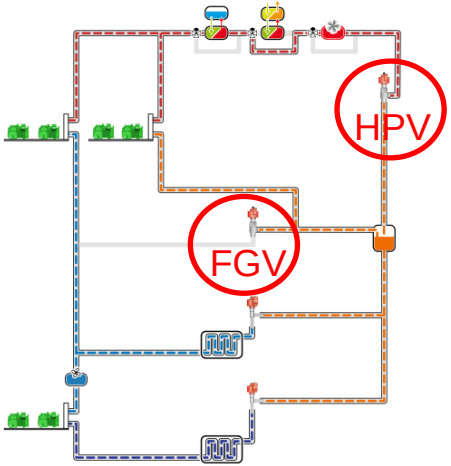
- Maximum Differential Working Pressure (MOPD) = **90 bar** (1305 PSI)

- Fluid Working temperature limits: -40T70ºC (-40T158ºF)
- Environment Working temperature limits: -30T70ºC (-22T158ºF)

ExV-C «Sistema»

- **pRack 300T/µRack CO_2** is the Carel controllers for CO_2 transcritical systems

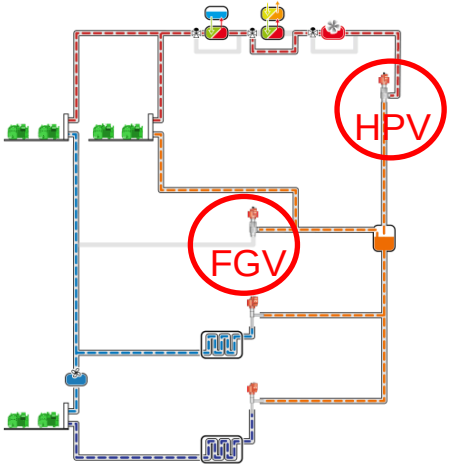


pRack CO

µRack CO

ExV-C «Sistema»

- **pRack 300T/µRack CO_2** is the Carel controllers for CO_2 transcritical systems
- The E5V-C can be used as **HPV** and **FGV** in the centralized systems



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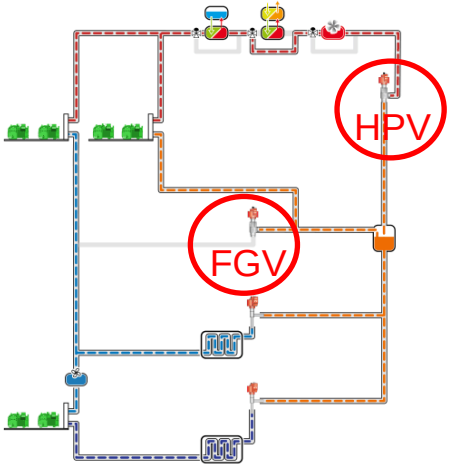
- The E5V-C can be used as **HPV** and **FGV** in the centralized systems
- Ejectors, supervisors, speed drives are other components of the so called "**Carel Sistema**": the E5V-C is fully integrated in it



pRack CO

µRack CO

The selection tool – Carel CPQ

Valve Selection: Based on parameters like flow rate, refrigerant type, system capacity, and operational conditions.

Customization Options: Users can select features such as connection types, valve sizes, and specific control options that meet the project's needs.

Real-Time Validation: Ensures that chosen configurations are technically feasible and compatible with Carel's systems and components.

Summary of the presentation

In this presentation, we have explored the key features and operational advantages of the E5V-C electronic expansion valve, focusing on its advanced control capabilities and unique design.

The valve is optimized for precision in flow regulation, making it ideal for industrial applications requiring stable, energy-efficient operation in cooling and heating systems.

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I have highlighted:

- **Technical Specifications**
- **Performance Benefits**
- **Applications**
- **Integration** with other **Carel components**

Q&A and more information

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