

Connected
Efficiency



CAREL



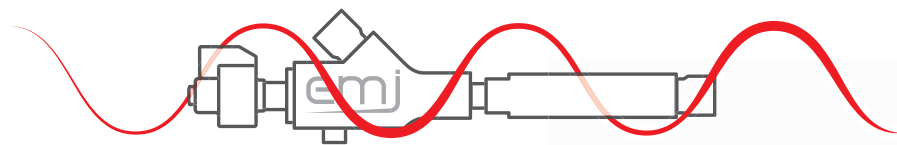
emj

Electronic Modulating Ejector
Boosting CO₂ efficiency

carel.com

CAREL modulates efficiency with its new ejector

Modulating ejector for transcritical CO₂ refrigeration systems

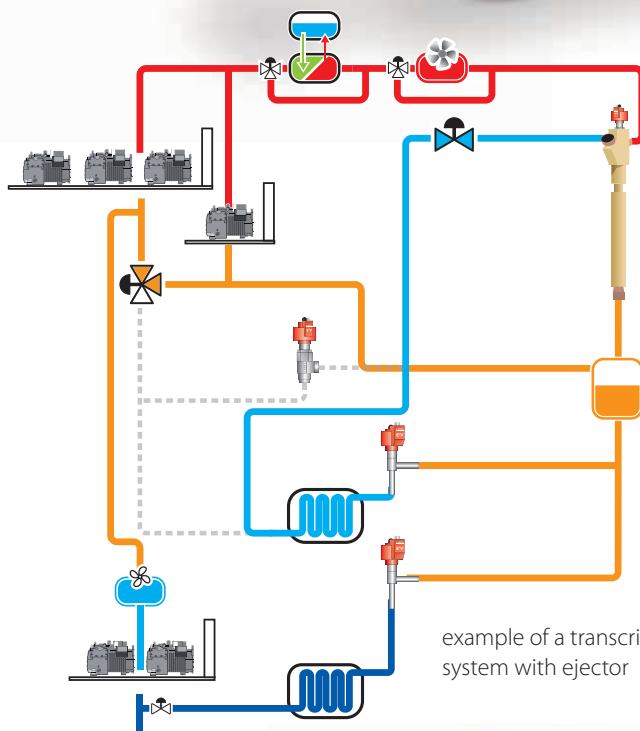


Continuous modulation

Continuous modulation is at the forefront of CAREL's solutions, applied to expansion valves, control systems for BLDC compressors and now modulating ejectors. Through precise modulation, **CAREL can ensure maximum system efficiency by optimally managing different operating conditions and adapting to different system requirements, specifically at part loads. Continuous modulation simplifies intrinsically complex technology.** Regarding ejectors in particular, continuous modulation is a new feature that allows the use of just one auto-adapting device to guarantee optimum energy efficiency and performance.



- **Continuous modulation** for optimum control of the system in different operating conditions
- Efficiency at every latitude
- Flexibility: up to 6 different sizes, each with variable capacity
- Innovation for everyone: easy to use and integrate into CAREL systems



example of a transcritical CO₂ system with ejector



Easy to use

The modulating ejector **optimises installation costs** and reduces system complexity. EmJ modulating ejectors can be **completely disassembled and inspected**, and the body can be installed separately, meaning the actuator can be removed independently.



Reliability and safety

In the closed position, the ejector ensures excellent tightness, acting in the exact same way as a back-pressure valve. EmJ moreover ensures closing at all times thanks to Ultracap technology, guaranteeing total safety.



Energy saving

"Naturally efficient" in all climates. The use of ejectors brings high energy efficiency at every latitude, overcoming the barriers of the past. EmJ guarantees improvements in system performance of up to 25% (in design conditions).

Energy Saving
up to

25%

Natural efficiency
RED'Y for all climates

Efficiency at every latitude

The refrigeration system is specifically designed to work with the ejector, reducing system complexity by continuously and immediately adapting to different operating conditions. Improved efficiency is the result of two separate elements:

- lower superheat (and higher evaporation temperature) in medium-temperature units
- a higher operating pressure for medium-temperature compressors.

pRack pR300T for EmJ

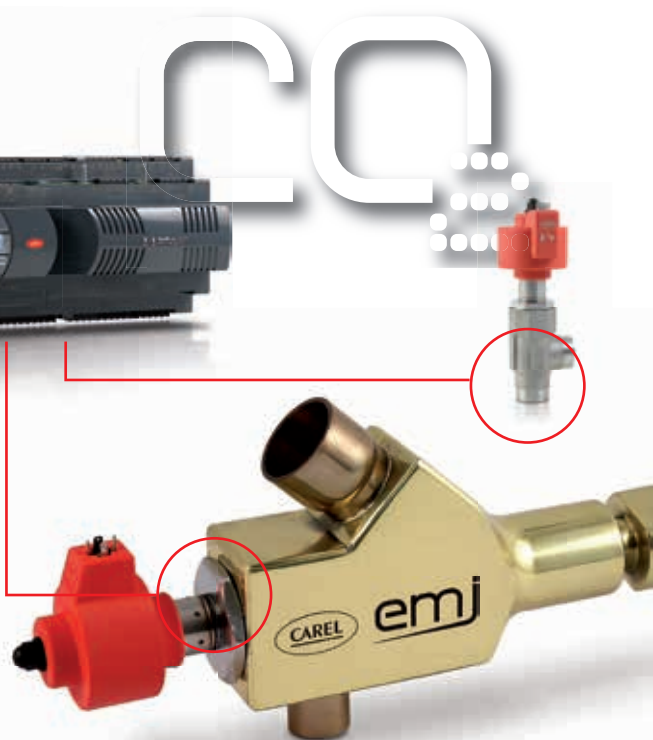
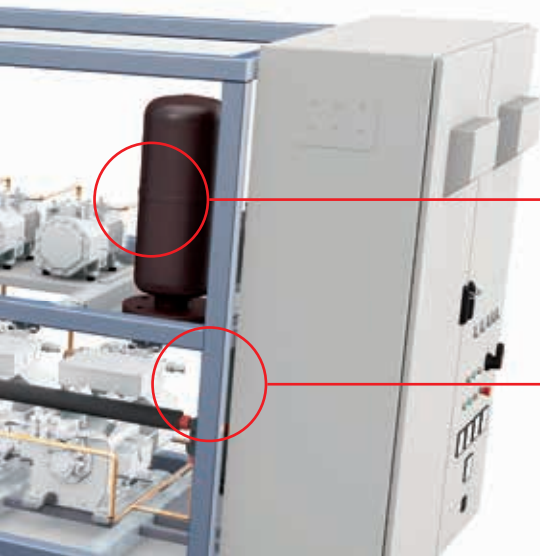
Using the CAREL pR300T controller for transcritical CO₂ systems to manage CAREL EmJ ejectors enables integrated and synchronised management of all the main parts of the system:

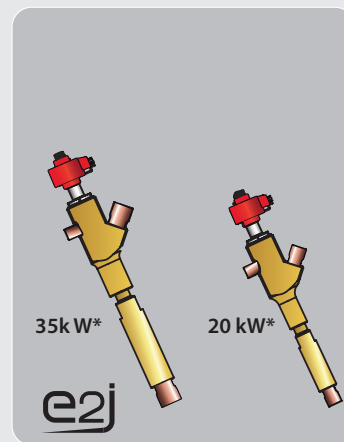
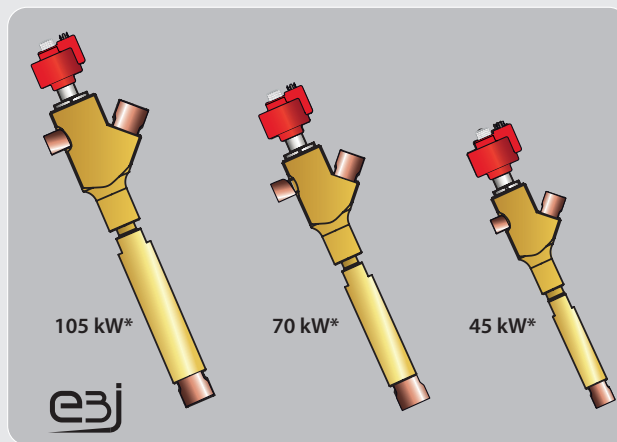
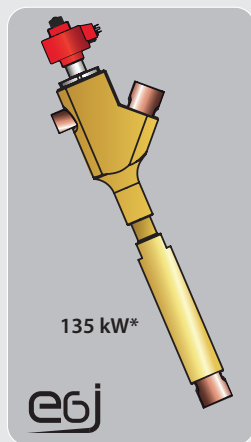
- medium temperature compressors
- low temperature compressors
- parallel compressor
- gas cooler
- receiver
- flash valve
- ejector

Specially-devised algorithms implemented for high-pressure control guarantee exceptional energy efficiency, as the electronic valve is no longer required. Another fundamental feature of the system with ejectors is the possibility to use medium-temperature compressors as parallel compressors, thus reducing the total number of compressors required and increasing efficiency.

Main features

- HPV valve no longer required
- Possibility to use medium temperature compressors as parallel compressors
- Ultracap technology for immediate closure of the ejectors in the event of power off
- Scalable platform: 6 different sizes of EmJ (from 20 to 135 kW)
- Real-time control of unit set points





*Conditions: R744 - t cooler outlet = 35°C - 95 °F - t evaporating = -5 °C - 23 °F

The range of modulating ejectors comes in six different sizes, each of which can modulate the high pressure flow. Various capacities are possible with the CAREL EmJ range, from a few kW to more than one hundred kW.



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