Modulating Vapor Ejector Principle and Function

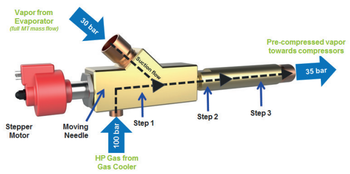
Modulating ejector technology combines **the benefits of an expander and an economizer.**

This component uses high-pressure energy to pre-compress the Medium Temperature suction mass flow from suction pressure to a higher level. By pre-compressing the Medium Temperature suction flow (free recovery of High Pressure energy), the compressor work is reduced.

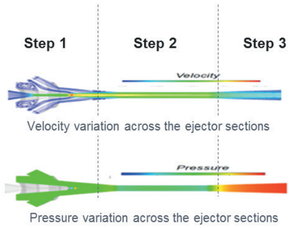
All MT compressors can therefore operate in economizer mode, resulting in reduced electrical energy consumption.

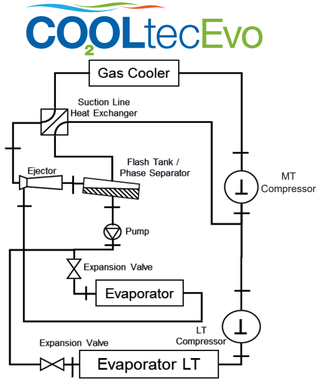
The modulating vapor ejector replaces the high pressure valve, it uses accurate stepper motor control for optimal capacity-matching across the entire range of operating conditions.

Parallel ejectors are used (3 on average) to optimize part-load performances and reduce Medium Pressure fluctuations.



Step 1: convert pressure → velocity
Step 2: suck and accelerate suction flow
Step 3: convert velocity → pressure





High performance CO_2 pump

The CO_2 pump allows full year „flooded" operation. When the ejector can not deliver enough delta P, the CO_2 pump will maintain enough pressure to ensure normal operation of the consumer expansion valves.

The smart control will keep the efficiency at its optimum by turning the pump off when enough delta pressure is provided by the ejector.

A complete range of CO_2 solutions with high energy efficiency for all applications and all climates

Compressor Racks & Condensing Units

Heat exchangers

PROFROID

178, rue du Fauge - Z.I. Les Paluds - BP 1152 13782 Aubagne Cedex - France
Phone: +33 4 42 18 05 00 - Fax: +33 4 42 18 05 02 - Export Fax: +33 4 42 18 05 09
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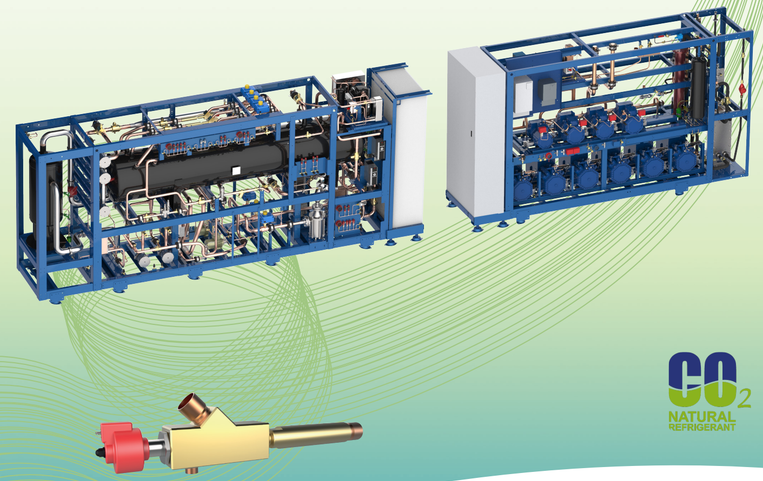
PROFROID

PATENTED INNOVATION

COOLtecEvo

Energy savings of up to 30%* compared with standard transcritical CO_2 systems

CO_2OLtec Evo® features innovative and patented technologies including the modulating vapor ejector and a pump-assisted cycle.



CO2 NATURAL REFRIGERANT

www.profroid.com

Cooling capacity LT: from 0 to 450 kW
Cooling capacity MT: from 65 to 600 kW

BEST IN CLASS
PAY BACK
FLEXIBILITY
SIMPLICITY

CO2OLtecEvo

Enhanced-efficiency transcritical CO_2 systems with modulating ejector technology

Latest generation of CO_2 transcritical systems, CO_2OLtecEvo® provides **energy efficient** and **environmentally sustainable refrigeration,** through our **patented modulating ejector technology** and a **CO_2 pump.**
To **further enhance energy savings,** this revolutionary system can also be delivered with **optional air conditioning and heating functionalities.**

Unique patented modulating ejector
to adjust to capacity variations, operating full year round to benefit from the high pressure work recovery

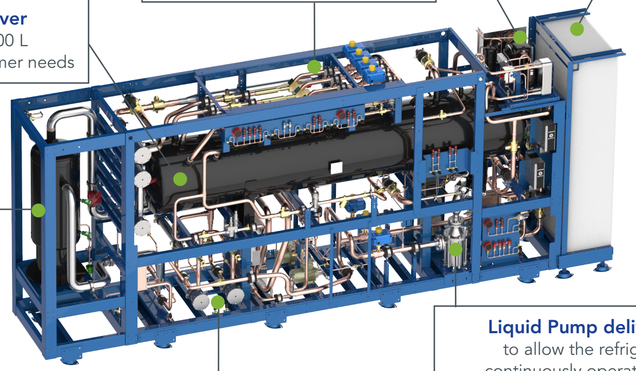
Emergency condensing unit integrated (option)

Optimized control
via dedicated software

From 2 to 4 ejectors per skid
depending on the application

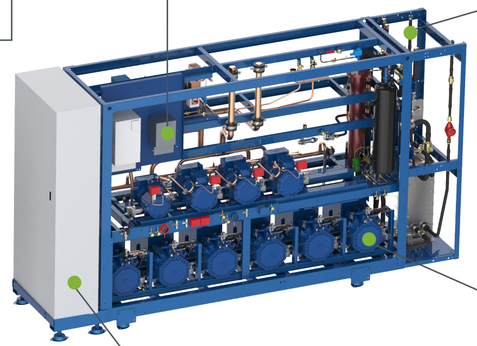
Horizontal receiver
200, 400, 600 or 800 L
depending on the customer needs

LT flooded module
(option)



Variable Speed Drives (VSD)
on the lead compressors

Heat recovery module
with several options available



Up to 6 MT compressors and 4 LT compressors

Different control types
(Carel, Danfoss, Eckelmann)

Rack electrical cabinet
using smaller electrical power supply delivered wired and mounted

Liquid Pump delivered as standard
to allow the refrigeration system to continuously operate with semi-flooded evaporators at a higher evaporating temperature

Double filter drier line
(option)

Add-on high efficiency skid dedicated to the ejectors, CO_2 pumps, liquid receiver, additional heat exchangers and liquid line

MiniCO2OL compact or MaxiCO2OL compact rack with a large range of features and options including Medium and Low Temperature loops

CO2OLtecEvo provides a simple, high-efficiency flooded solution for all climates

BEST IN CLASS
- Best in class efficiency
- High efficiency in all climates
- Patented modulating vapor ejector assisted by a CO_2 pump

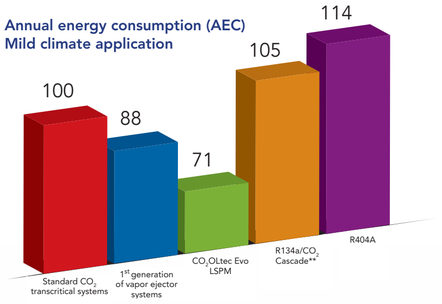
in all climates

PAY BACK
- Attractive return on investment
- Reduced cost of the main electrical power supply
- Additional energy saving combinations :
  - **LSPM compressor motors** to reduce annual compressor energy consumption vs standard technology
  - **Heat recovery** (up to 100% of the heat rejection)
  - **Heat pump and/or air conditioning functions**
  - **LT flooded module using a suction receiver and associated heat exchanger** on the low temperature side to enable flooded operation of the low temperature consumers

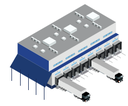
FLEXIBILITY
- Configurable design
- Choice of control types (Carel, Danfoss, Ecklemann)
- Multiple options available

SIMPLICITY
- Simple system layout
- Superior serviceability
- Enhanced reliability (versus other high efficiency systems)

Annual energy consumption (AEC)
Mild climate application



VARIOUS APPLICATIONS
- Medium and large supermarkets
- Warehouses



** For rack only, figures based on annual energy consumption.*
Projection based on 94m MT cabinets, 38m LT cabinets, 228m3 MT coldroom, 55m3 LT coldroom.
*Temperature profile: Mild Climate = Berlin (10°C avg); HybridCO2OL** = CO_2 LT + R134a MT*