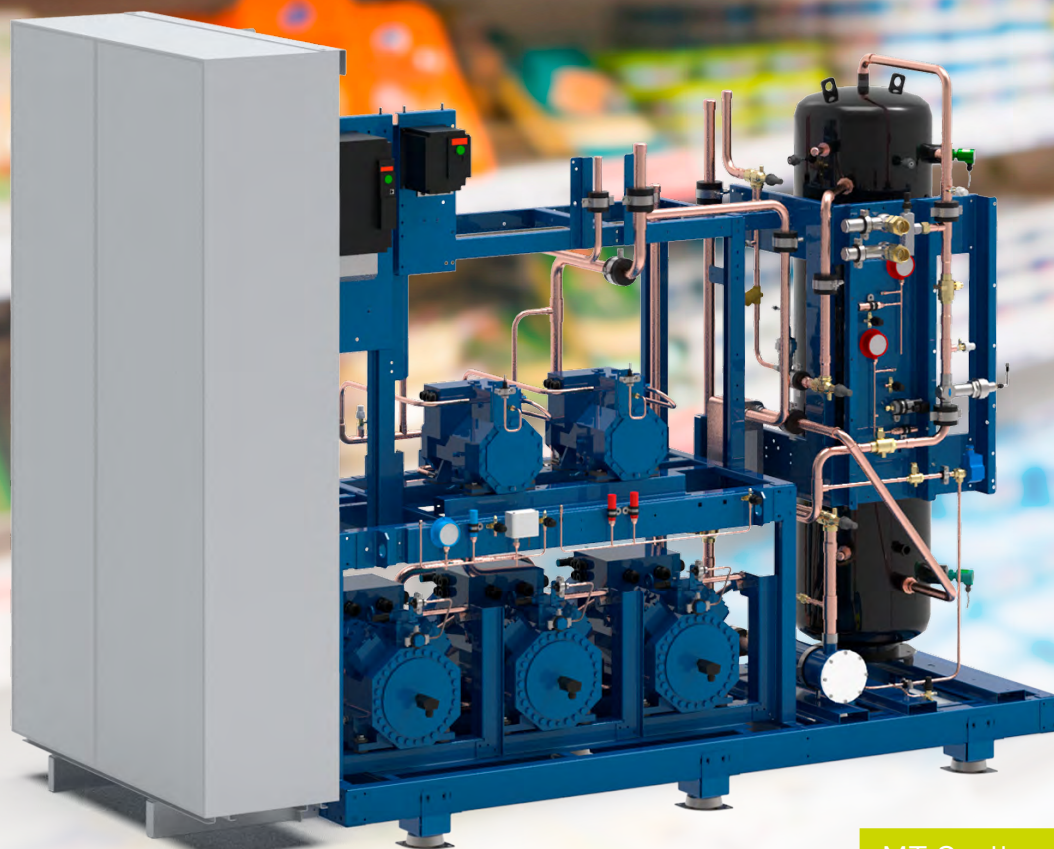


Carrier

CO₂ transcritical refrigeration systems
for convenience stores
and supermarkets

MiniCOOL₂ compact



MT Cooling capacity: **45-190 kW**

LT Cooling capacity: **0-57 kW**



MiniCO₂OL® Compact Standard

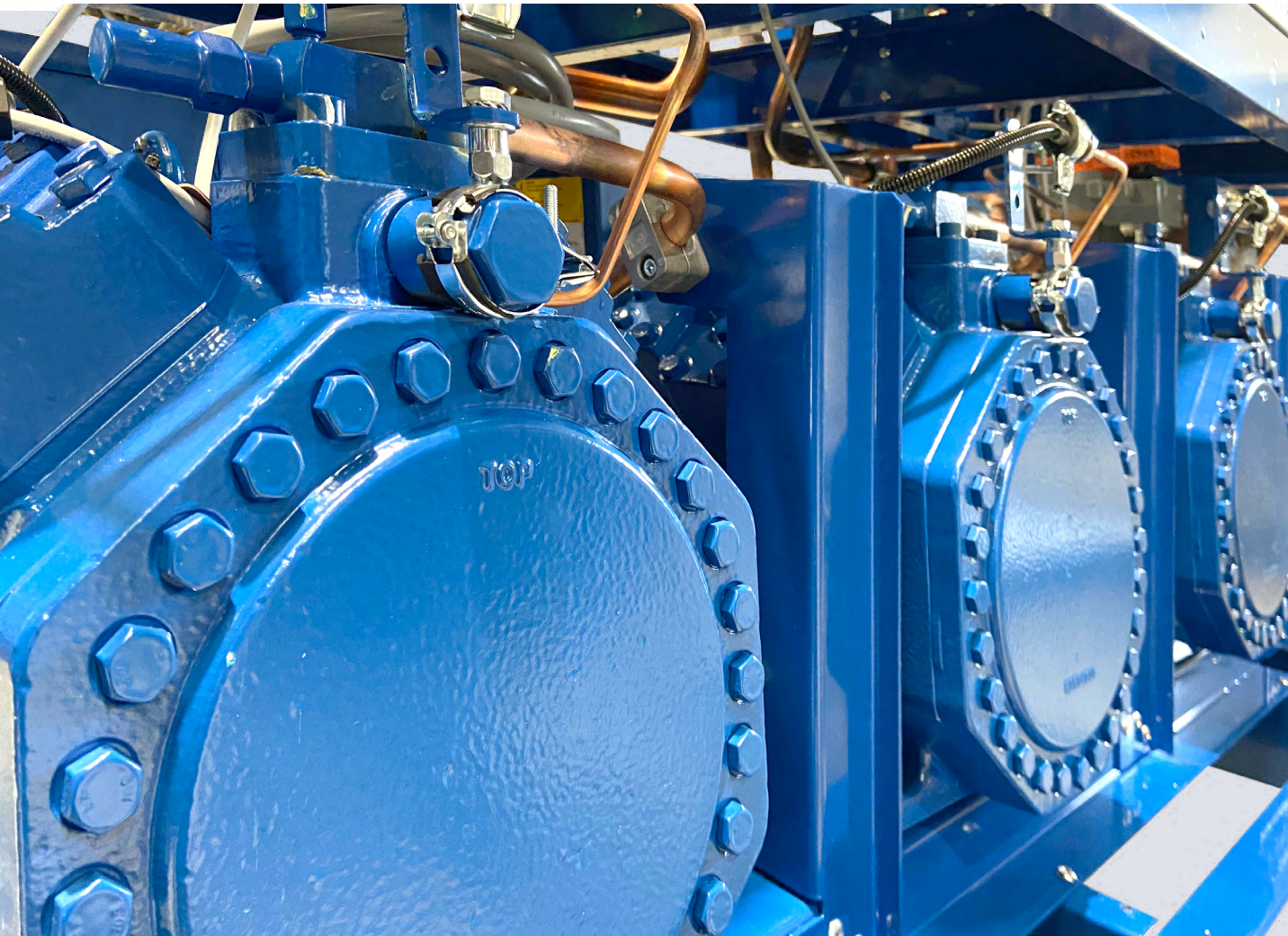
Our new range of MiniCO₂OL® Compact S has been designed for small to medium supermarkets as well as for small industrial applications such as cold rooms and bakeries going up to 190kW MT and 56kW LT cooling capacity.

This refrigeration system has been designed and improved based on the track record of the 20.000 CO₂ units installed in Europe and Asia since the beginning of CO₂ refrigeration.

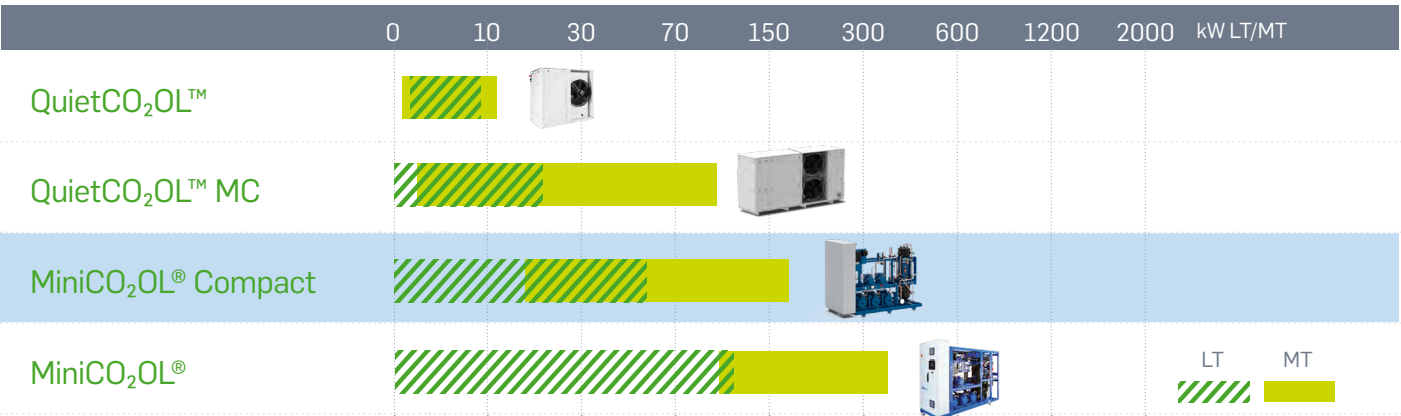
The product range is offering simplicity, easy handling, increased robustness and faster delivery time. It is well adapted for quick installation projects.

Summary

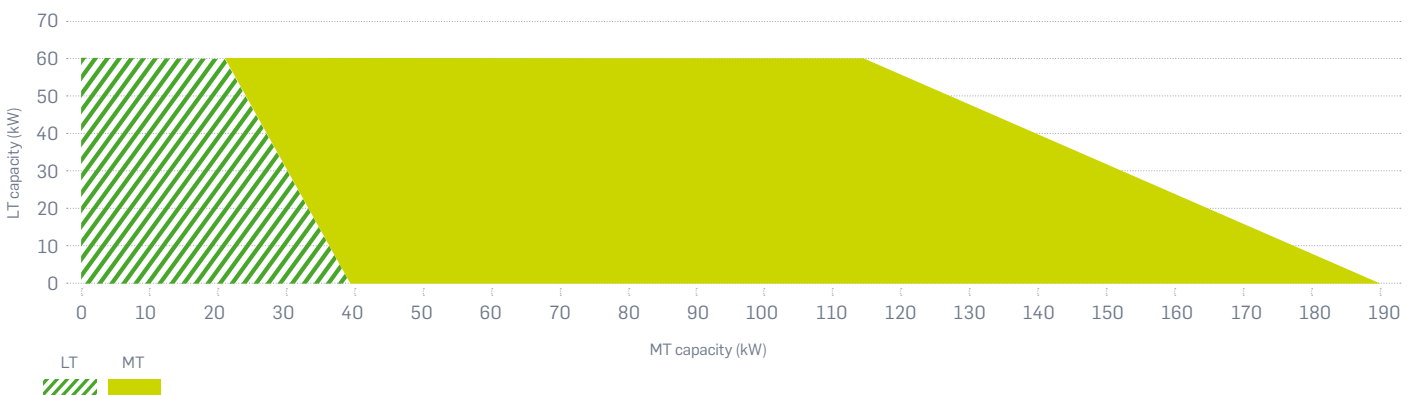
▪ Highlights – efficiency, design and functions	4	▪ Available options and functions	14
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▪ Components and connection points	6	▪ Electrical cabinet – simplicity and clarity	16
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Cooling capacity and applications



Cooling capacity (kW)



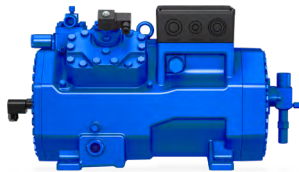
Highlights – efficiency, design and functions

This CO₂ rack for food retail applications has been designed and manufactured in our center of excellence and manufacturing plant located in Aubagne, France. The working conditions and vibration resistance have been tested in our German laboratory located in Mainz. The 60 bar design pressure and increased volume 188L receiver are perfectly adapted to the current and future usages in stores. The simplicity of the standard mini pack controller requires little CO₂ know-how to be run.

Optimized energy efficiency



Heat reclaim for heating and/or tap water available in order to re-use dissipated energy and increase COP



Advanced capacity control CRIL for capacity modulation from 10% to 100% on the first MT compressor (option)



Advanced controller available in option with extensive energy management functions: flexible I/O modules add-ons, COP calculation, advanced gas cooler control and pressure optimization

Highlights – selection, delivery & maintenance

The system and the options are fully standardized, which ensures a high quality level, optimized order management and optimized delivery time. A particular attention has been paid to the accessibility and practicality with: an open top frame, the main components labeled (option) and a big size receiver of 300L (option) for more flexibility and safety.

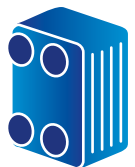
Easier to configure



Find the right configuration thanks to Cool System Select online configurator (release in progress)



Clear list of standard options with their benefits (safety, energy efficiency, modularity, customer support)



Easy selection table for heat reclaim modules

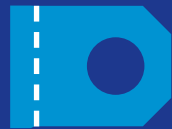
Robust design and increased quality



Standard 60 bar design pressure



Vibration & robustness test performed in our German laboratory



Stable frame convenient to lift, with removable attachment points



Fully standardized production according to Carrier Excellence™ quality process

Improved delivery time



Fully standardized and industrialized pack design ensuring reduced manufacturing time



Automated technical configuration and order processing workflow

Simplified control panel and connectivity functions



Little CO₂ know-how required thanks to the simple and intuitive mini pack controller



Get access to the pack data and adjust the parameters in real time through a supervision or a gateway, by using the well known Modbus protocol



Less complexity in the electrical panel for the same protection level

Better accessibility and maintenance



Open frame for better access to components, improved compressor replacement with extra space and clearly identified cable trays



Labeling of all critical component in option

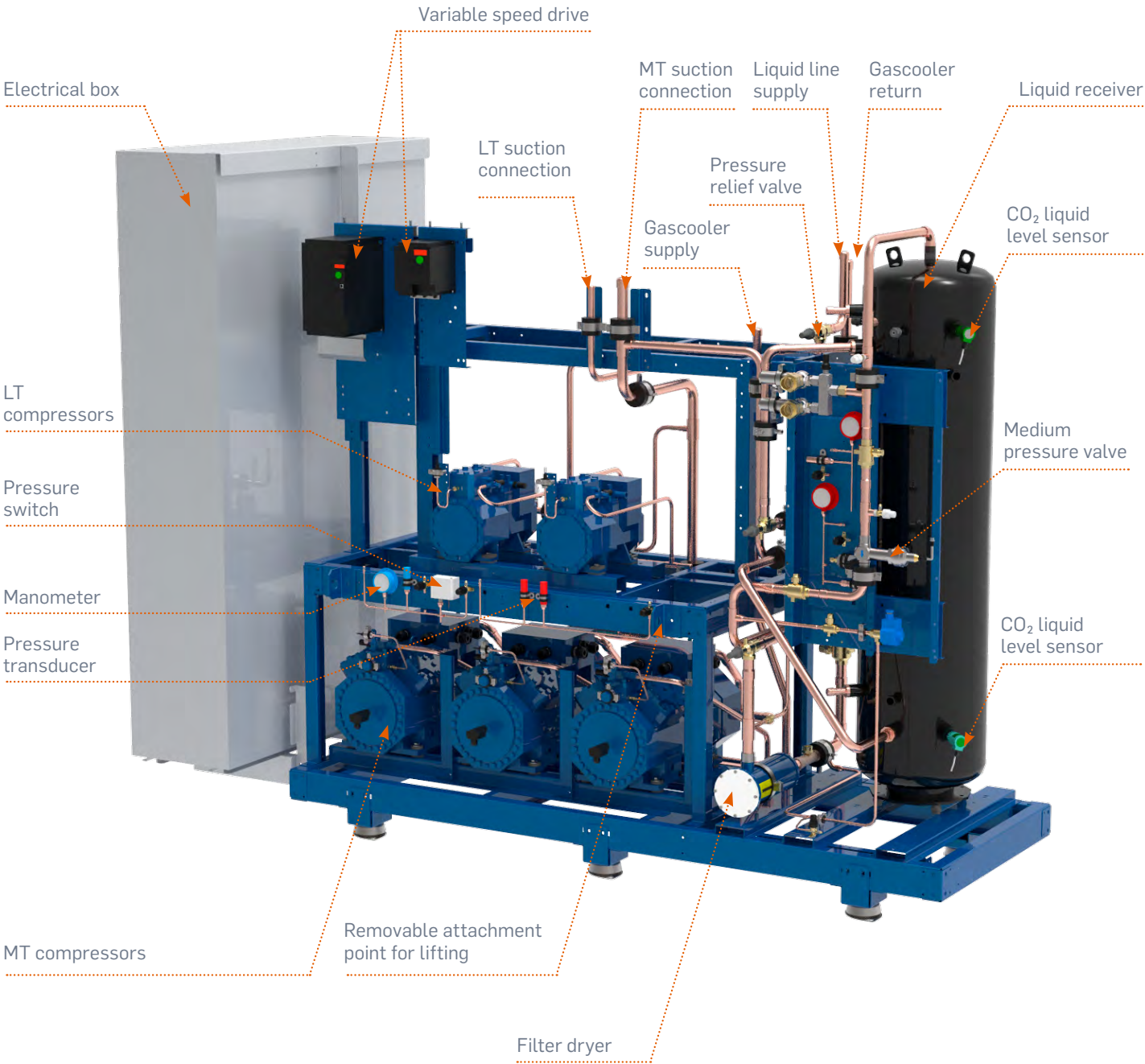


One big size 300L receiver available instead of two receivers for more simplicity



Support for the first commissioning by our own experts in option, and spare parts available across all European countries

Components and connection points



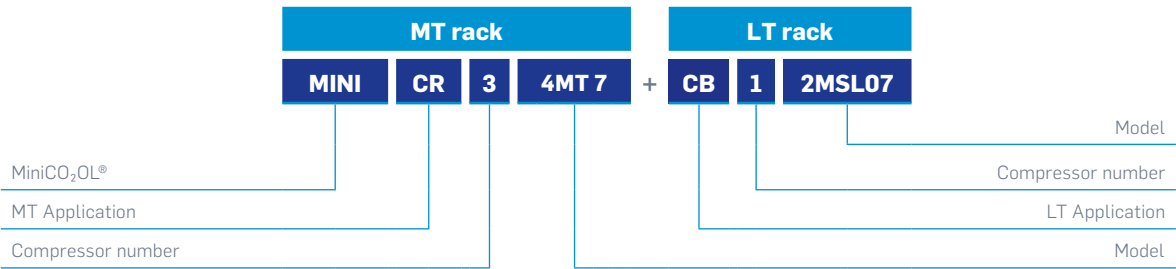
Standard technical features

General information	
Compressor configurations (MTxLT)	3x2 / 3x1 / 3x0
Number of MT compressors	3
Number of LT compressors	0 to 2
Max cooling capacity MT*	190 kW
Max cooling capacity LT*	56 kW
Evaporating range (MT/LT)	-12°C to -5°C / -40°C to -30°C
Power supply voltage (V)	400V / 3 Phases / 50Hz
Weight (kg) (without electrical enclosure)	From 825 kg to 1250 kg
Liquid receiver volume	188L as standard 300L in option
Frame	
Frame	Steel profiles frame RAL5010 Antivibration pads mounted
Height	1995 mm
Length	2344 mm
Length + e-cabinet	2842 mm
Length + e-cabinet + heat reclaim	3355 mm
Width	850 mm
Design pressure	
High pressure	120 bar
Receiver pressure	60 bar
MT suction pressure	52 bar
LT suction pressure	30 bar
Controller	
Controller brands	Danfoss as standard Carel and Eckelmann in option
Heat reclaim (heating + tap water can be combined)	
Heat reclaim range - heating (kW)	Up to 204 kW
Heat reclaim range - tap water (kW)	Up to 50 kW
Electrical cabinet	
Neutral system	TN as standard
Short-circuit current (kA)	10 kA
Other components	
HP & MP valves type	CCMT (HP) / CCM (MP)
Compressors	Semi-hermetic
Frequency inverter	400V, 30Hz to 55Hz (MT compressor)
PED technical documentation	Included

* Conditions: -30°C evap./-5°C OK subcooling 20K superheating

* Conditions: -5°C evap./38°C gascooler outlet - 94bar / OK subcooling 15K superheating

Model designation



Available options and functions

Function / option	Description	Main benefit
Mechanical systems		
Active oil management	The active oil management is recommended to ensure optimal compressors lubrication. It includes: the separator, the oil tank, the oil level regulators on the compressors.	
Larger receiver volume (300L)	A larger receiver volume gives you more flexibility and safety, allows longer piping distances	
Heat recovery - heating	Select the heat recovery with the selection table in appendix. Option mounted on the rack with Isolating valve + anti-boiling 3-ways valve + gas Cooler Bypass + Muffler (if no active oil management). Can be combined with heat recovery for sanitary hot water usage.	
Heat recovery – tap water	Select the heat recovery with the selection table in appendix Option mounted on the rack with Isolating valve+ anti-boiling 3-ways valve + gas Cooler Bypass + Muffler (if no active oil management). Can be combined with heat recovery for heating usage.	
Components labeling	The 40 main components are identified with labels, having the same code than on the PID.	
Receiver emergency cooler	Stabilize the pressure inside the liquid receiver in case of power failure. Option mounted on the rack with the shut-off valve.	
LT suction accumulator	Avoid liquid refrigerant to be sucked into the LT compressors. Option mounted on the rack with double safety valve.	
Optical oil level monitoring - OLCK1	Monitors the right oil level inside the compressor	
Connections for LT desuperheater	Allows to connect a heat exchanger in order to reduce the superheat at the MT compressors suction	
Muffler at common MT discharge line	Reduces pulsations in the circuit. Not necessary in case of active oil management. Mandatory in case of passive oil management combined with heat reclaim.	
Instrumentation & valves		
High and low level switch on CO ₂ liquid receiver	Indicates if liquid CO ₂ reached the low and high level in the receiver	
CO ₂ manometers	Indicates pressure of refrigerant at different points of the circuit	
LP safety switch for MT rack	Reinforce MT rack safety (discharge)	
LP safety switch for LT rack	Reinforce LT rack safety (suction)	
HP safety switch for LT rack	Reinforce LT rack safety (discharge)	
CO ₂ liquid level measurement (DNI)	Connections only. When used in the dedicated system (not in the delivery) it allows to monitor the exact liquid level in the receiver. (Only available with Danfoss or Carel controller)	
CO ₂ liquid level measurement (Ice Smart)	Informations can be crossed with operational datas in order to give warnings if a refrigerant leak is detected.	
Suction valve and suction line filter (LT)	Maintain a clean circuit (LT side)	
Suction valve and suction line filter (MT)	Maintain a clean circuit (MT side)	
Electrical devices & Controls		
Plug&play electrical cabinet	Delivery of the electrical cabinet fully assembled, wired and tested with the right protections and neutral system for managing the rack, the gascooler and the heat recovery if needed. More information in the electrical cabinet's section.	
Wiring of the cabinet and rack	Wiring of the power and controls from the electrical cabinet to the rack	
Additional cable length	Allows to position the electrical cabinet at a certain distance from the rack (against a wall for instance). Cable lengths available in 2, 5 and 10 meters.	
Frequency Inverter on LT1 compressor	Variable speed drive for extended capacity control on LT racks	
Frequency Inverter FC301 Danfoss	Danfoss variable speed drive	
Capacity regulation (CRII)	Capacity regulation from 10% to 100% fitted with Bitzer's IQ module. The option includes: CRII solenoid valves on compressors, specific compressor, discharge temperature sensor, control box (CM-RC-01), oil level controller type OLC-K1 / OLC-DP1.	
Advanced Danfoss controller (AKPC782)	This controller provides more control capability, advanced energy management and communication features	
Electrical energy meter	It measures the amount of electrical energy consumed	
Carel controller	Pre-set & mounted Carel rack controller (+probes)	
Eckelmann controller	Pre-set & mounted Eckelmann rack controller (+probes)	
Back-up controller (Danfoss)	Delivered separately non programmed. Allows to quickly replace the controller in case of failure (Parameters need to be adjusted according to the installation)	
Back-up controller (Carel)		

Function / option	Description	Main benefit
Technical support		
Support for commissioning from experts in CO ₂	Commissioning support with our CO ₂ experts: - Technical commissioning in your presence - Control and backup of main controller parameters - Tests off load: I/O modules, electrical cabinet, actuators, regulation and safety devices - Tests under load: compressors, regulation devices and safety - Commissioning reports	👉
Warranty extension (1 extra year)	1 year warranty extension to benefit from premium service (maximum 2 years)	

✔ Safety

🌿 Energy efficiency

📶 Monitoring

👉 Practicality

Heat reclaim function

Heat can be reclaimed for sanitary hot water (tap water) or/and heating.
Both usages can be combined by using 2 exchangers.

Conditions:

- P CO₂: 85 bar
- T CO₂ inlet: +115°C
- Pressure drop (water side): 30 kPa
- CO₂ flow rate: 60 % of the total
- CO₂ outlet: depending water temperatures

		Heating water temperature*	Heat exchanger model & max capacity**				
🔧	Sanitary hot water	+25°C/65°C	Type 1	Type 2	Type 3	Type 4	Tap water
				63 kW max		88 kW max	50 kW max
🔥	Heating	+40°C/45°C					
		+20°C/45°C	113 kW max		204 kW max		
		+25°C/45°C	104 kW max		187 kW max		
		+30°C/50°C	81 kW max		141 kW max		
		+35°C/45°C		74 kW max		130 kW max	
		+50°C/60°C	46 kW max		80 kW max		
		+30°C/45°C	81 kW max		156 kW max		

* Other water temperature can be considered, please contact us for specific demands
** The capacities represent the maximum value of heat recovered. The real value can be lower depending on your rack. Each heat exchanger covers a part of the rack capacity range only. In order to select the right combination of rack + heat exchanger, please consult us.

Electrical cabinet – simplicity and clarity

The design of the electrical cabinet is based on the essentials which are the control of the rack, the gascooler and the heat recovery.

Controllers:

- The standard controller is a mini pack controller
- The outputs are connected directly to the devices to be controlled
- Some information are collected on one single entry in order to reduce the configuration effort of the controller while maintaining all its functionalities
- For programming details, refer to the controller documentation

Heat reclaim:

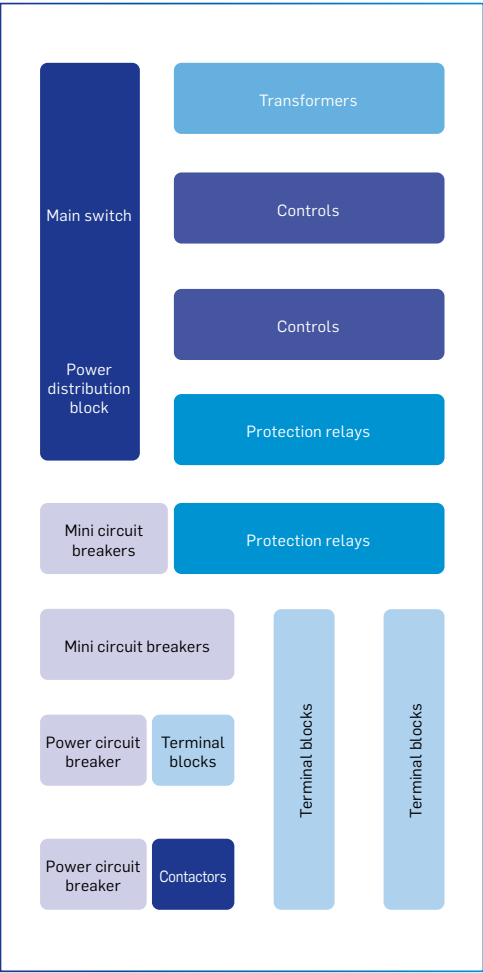
- Valves and pumps are managed by the controller
- For the pumps, a 0-10V setpoint signal and an enable signal are provided on terminal blocks. (The pump power supply is not included)

Electrical cabinet:

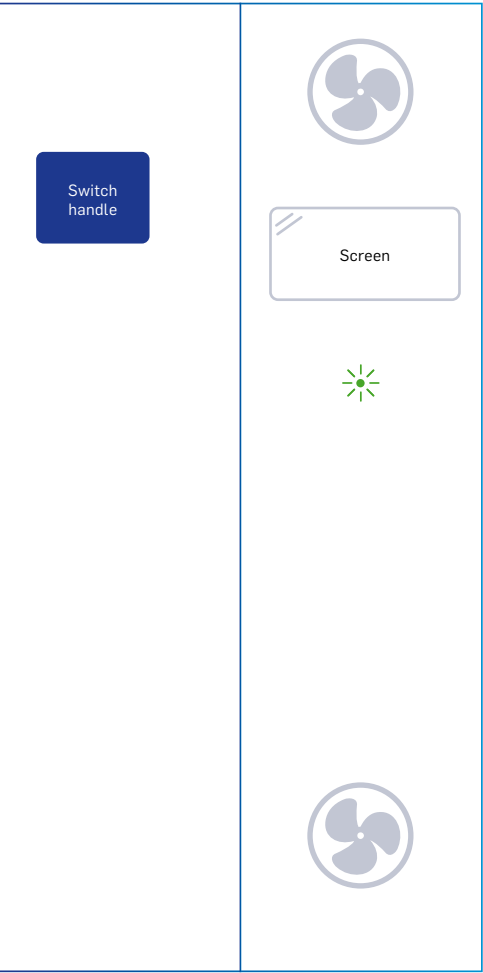
- The standard control cabinet has the following dimensions: H 2000 x W 1000 x D 400, with 2 doors

Example of electrical cabinet layout with mini pack controller and heat reclaim controller

Inside view

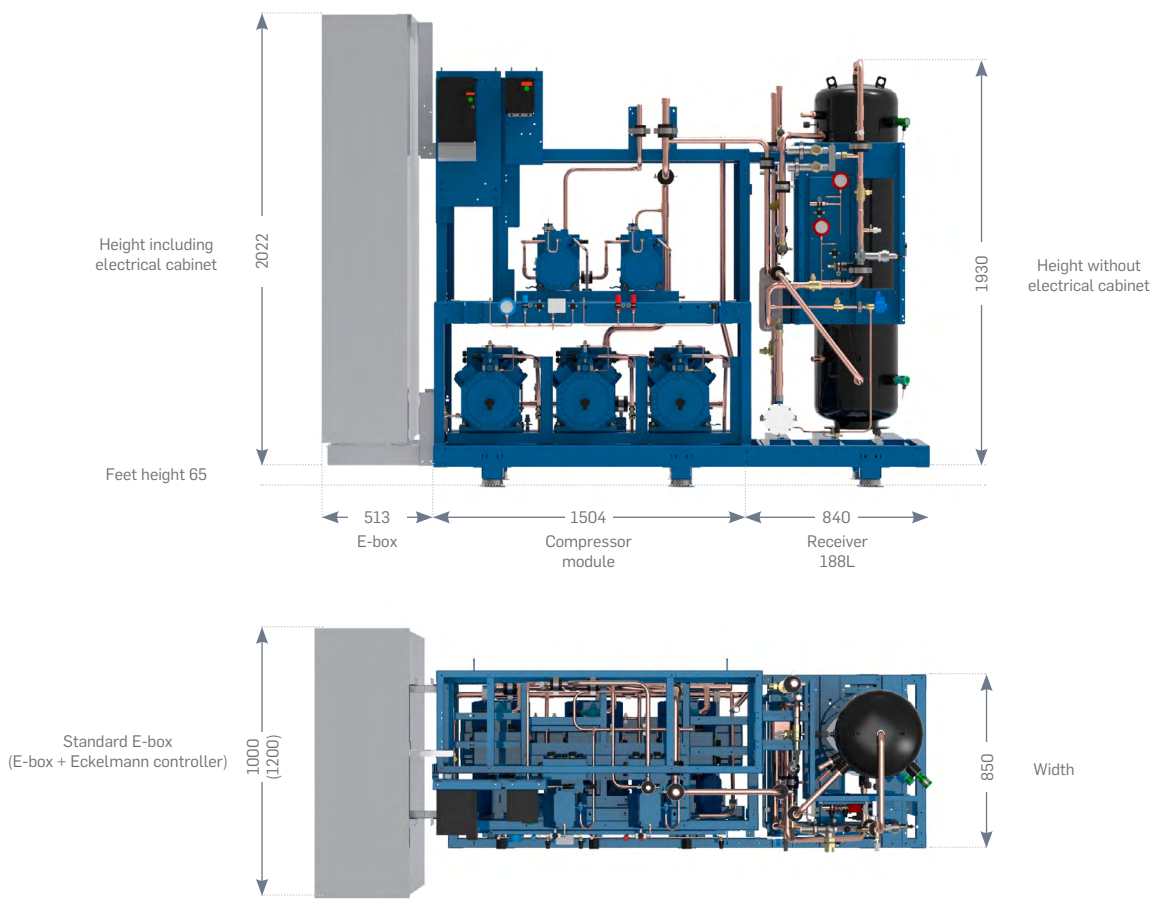


Door view

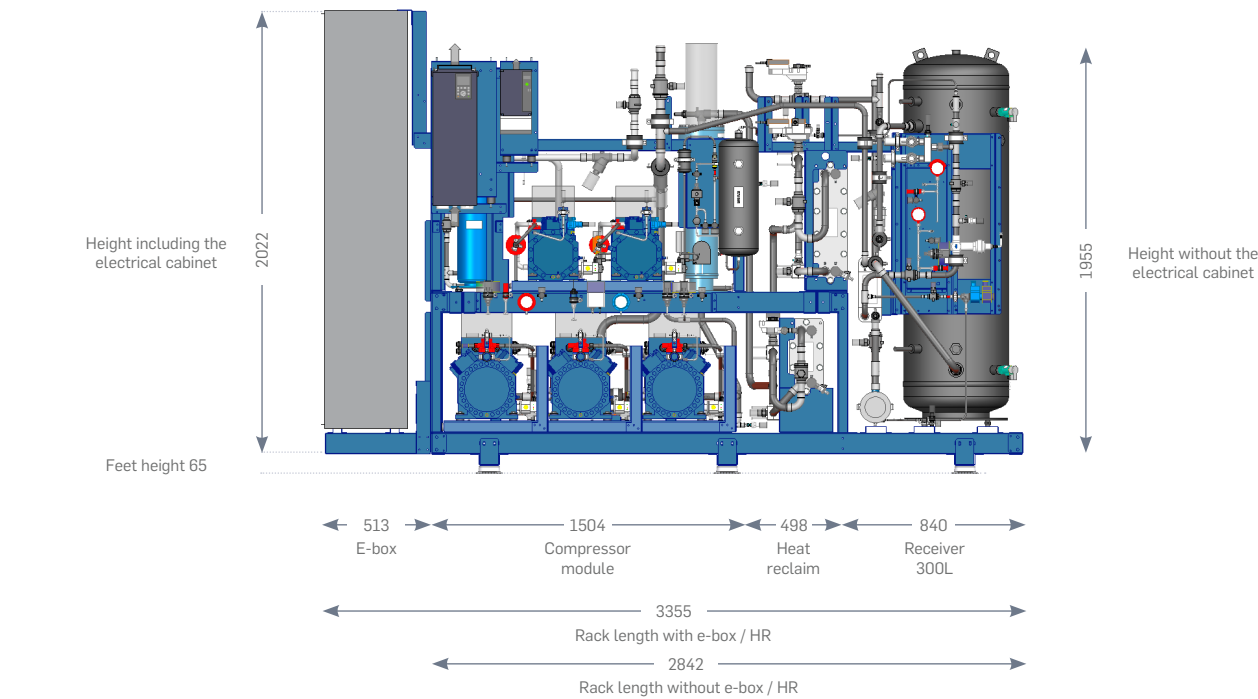


Dimensions (mm)

Simple model without heat reclaim



Model with advanced functions and heat reclaim







Discover our complete range of CO₂ solutions

