A BEIJER REF Company

ECR Nederland -Köldfest 2025

SCM FRIGO Italy

+45 Years in Refrigeration

Commercial & Industrial Refrigeration

Focus on Natural Refrigerants (CO_2)

Total area 35.000 m^2 | Built 15.000 m^2 | Production and Warehouse 13.000 m^2 | Offices and Beijer Academy 2.000 m^2

SCM HISTORY

1979 — SCM FRIGO establishment

2005 — Start of CO_2 units production

2009 — Regular supplier to the most important CO_2 tenders for RETAIL in Europe

2011 — SCM FRIGO S.p.A. Becomes: BEIJER REF

2014 — >1000 TC produced

2015 — Market Launch of $CUBO_2$ PLUS

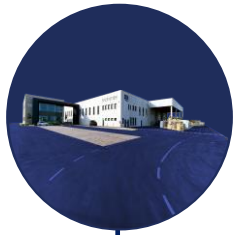
2017 — Market Launch of $CUBO_2$ SMART

2018 — BEIJER REF ACADEMY

2019 — Lean manufacturing

2019 — Anniversary

2021 — Inauguration of SCM Frigo S.p.A. new headquarter in Padova



2022 — iBOOSTER Launch

2024 — Restyling of $CUBO_2$ SMART

75M € turnover

260 employees

OUR VALUES

FLEXIBILITY

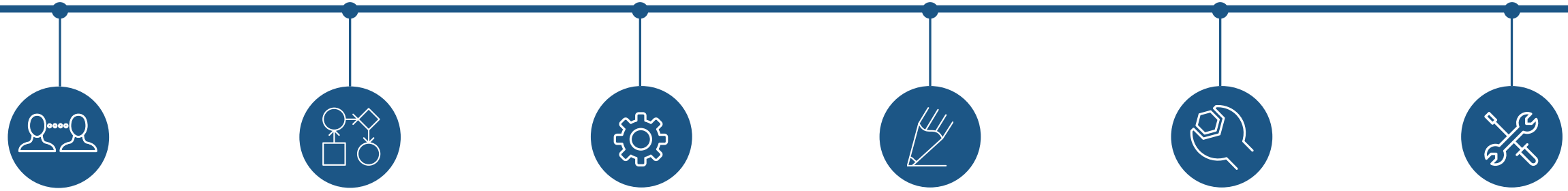
SUSTAINABILITY

TECHNICAL COMPETENCE

RELIABILITY

INNOVATION ORIENTED

COMFORT ZONE



Act as a consultant for our customers

Study Best solution with / for them

Customize the project

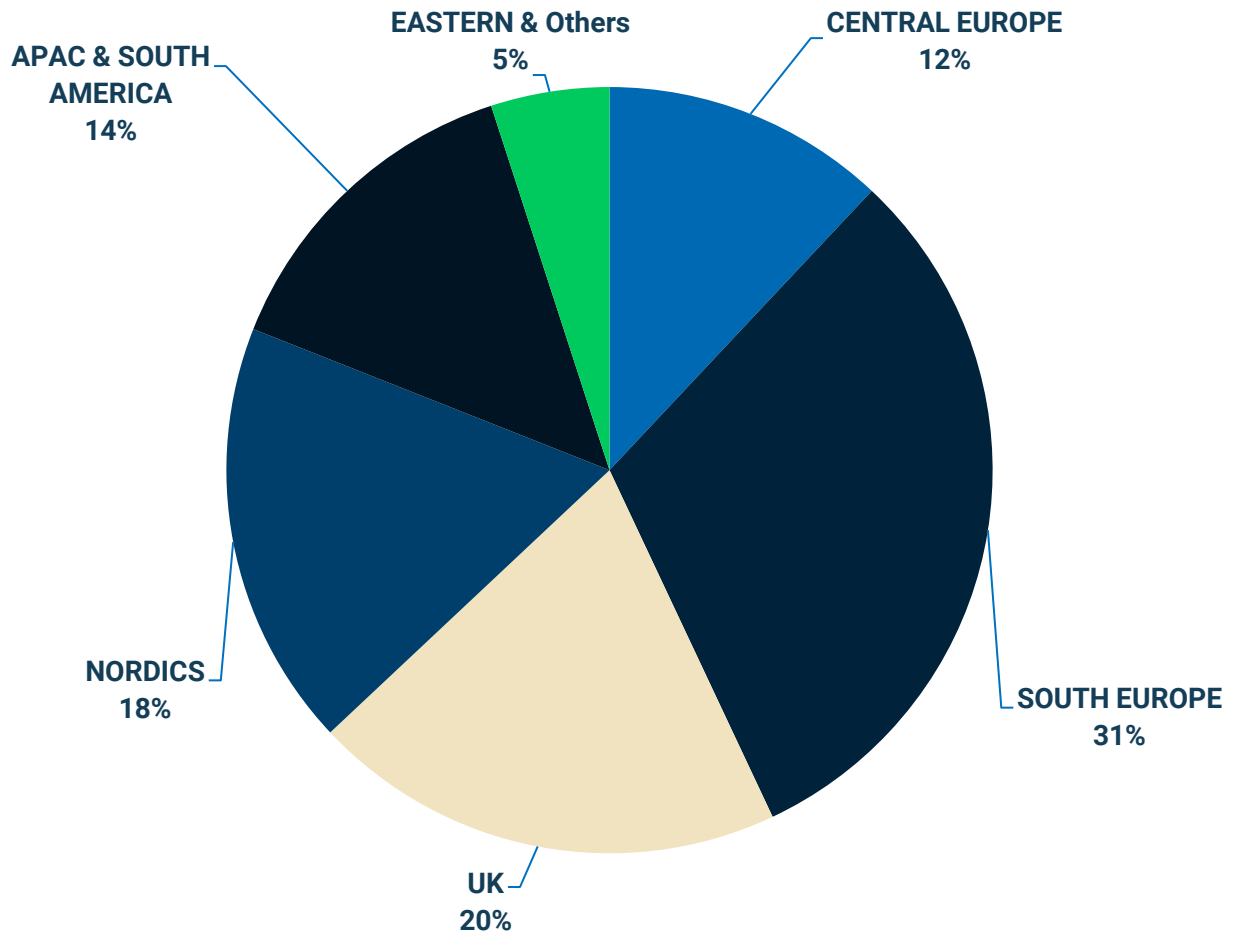
Training in the Beijer Ref Academy

Assisting at Start Up

Help in the fine tuning

LET THE CUSTOMERS FEEL IN THEIR CZ WHEN HE BUYS OUR UNITS

SALES DISTRIBUTION



LEAN PRODUCTION

The improvement of the production system as a key for the competitiveness

Since 2019 SCM FRIGO has gradually introduced the Lean Manufacturing Process for its production activity understanding what is VALUE for customer is the path to success.

We believe that reducing waste and optimising resources is another way of applying our sustainability strategy.

OUR PRESENCE

Installation Van der Valk Theaterhotel

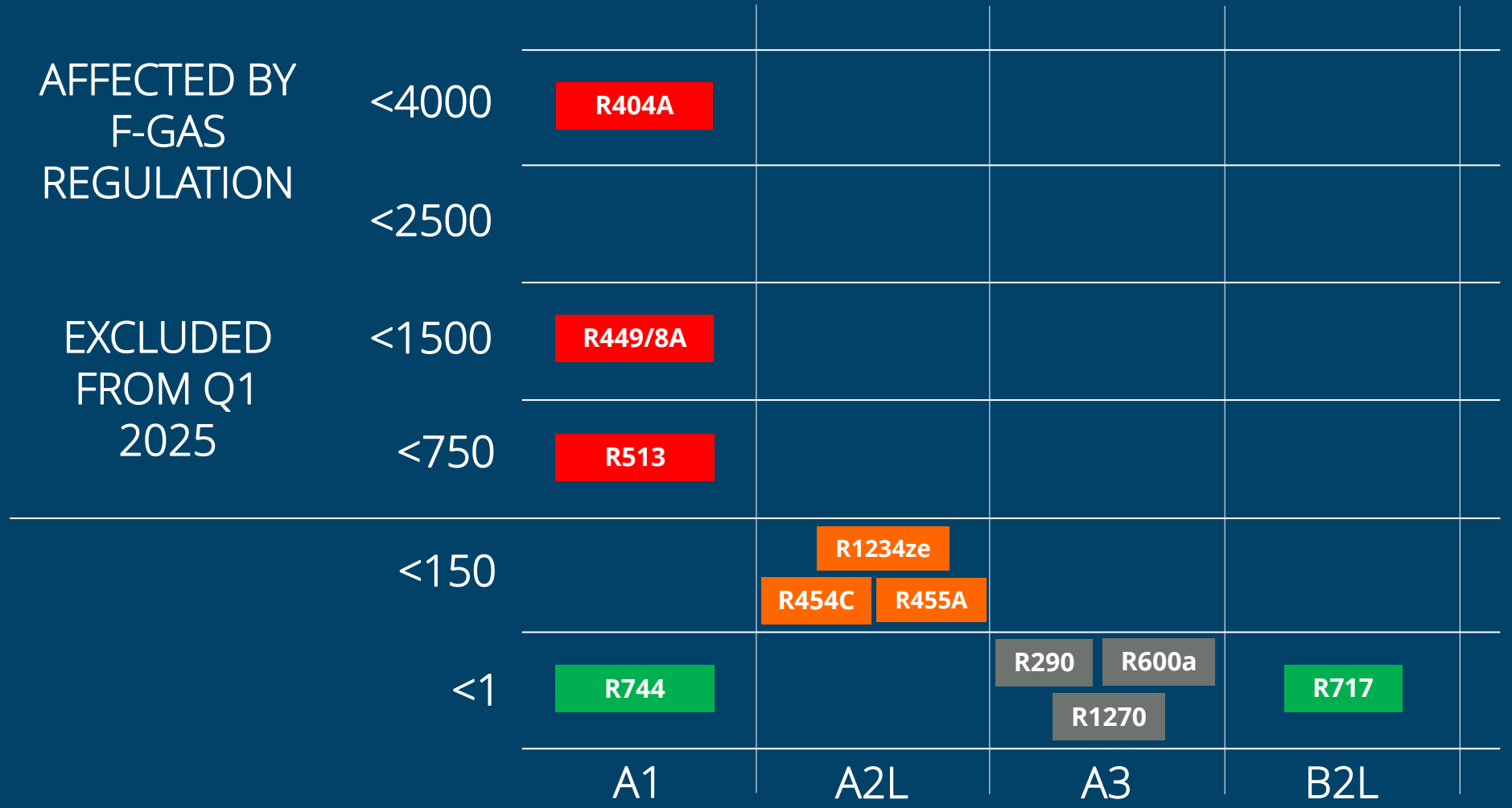
in Roermond

FUTURE-PROOF COOLING

Why CO_2 is the Right Choice

OUR REFRIGERANT OF CHOICE

GWP (global warming potential) / FLAMMABILITY



- A1 non flammable
- A2L mildly flammable
- A3 flammable
- B2L Toxic, mildly flammable

BENEFITS OF CO_2 REFRIGERATION

ENVIRONMENTAL

- Low Global Warming Potential (GWP)
- Zero Ozone Depletion Potential (ODP)
- Supports Sustainability Goals & Green Initiatives
- Natural and Non-Toxic
- Recyclability and Availability

ENERGY EFFICIENCY

- Superior thermodynamic Properties
- Higher Cooling Capacity than HFCs
- Works exceptionally well in cold climates, thanks to transcritical and subcritical cycle adaptability
- High heat recovery potential

SAFETY ADVANTAGES

- Non-flammable
- Non-toxic at Normal Concentrations
- Heavier than air, so easy to detect
- Chemically stable and non-reactive

BENEFITS OF CO_2 REFRIGERATION

OPERATIONAL AND COST

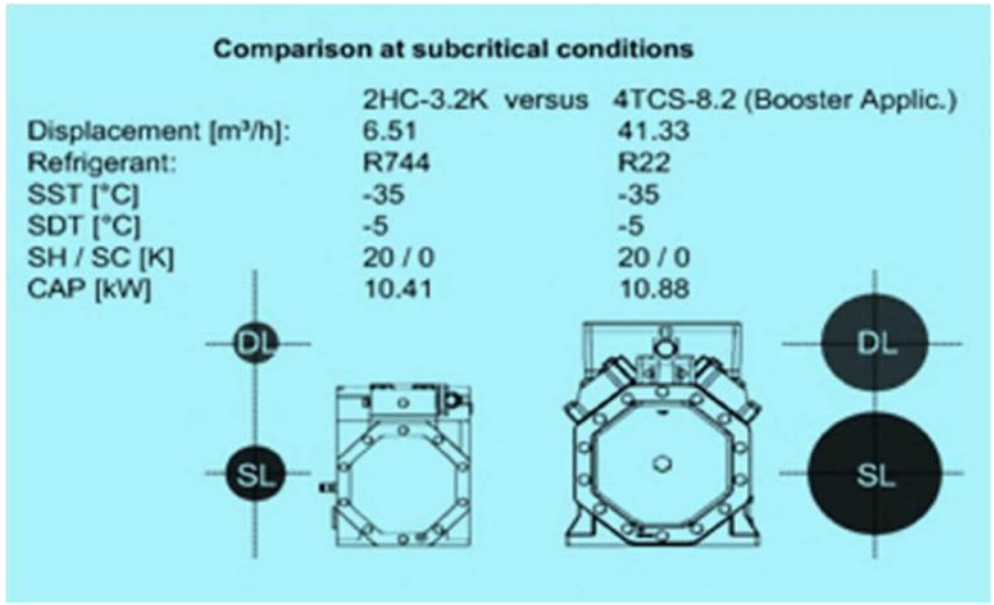
- Covered by government subsidies (in some countries)
- **Lower** and **Stable** Refrigerant Cost
- Reduced Compliance & Regulatory Costs
- Lower operational cost
- Lower Maintenance Costs
- No synthetic refrigerants needed

RELIABLE SOLUTION

- **Future-Proof Investment** as avoids regulatory bans on synthetic refrigerants
- **Durable System Components** designed for high-pressure operations
- Easy Leak Detection & Maintenance

FLEXIBLE SOLUTION

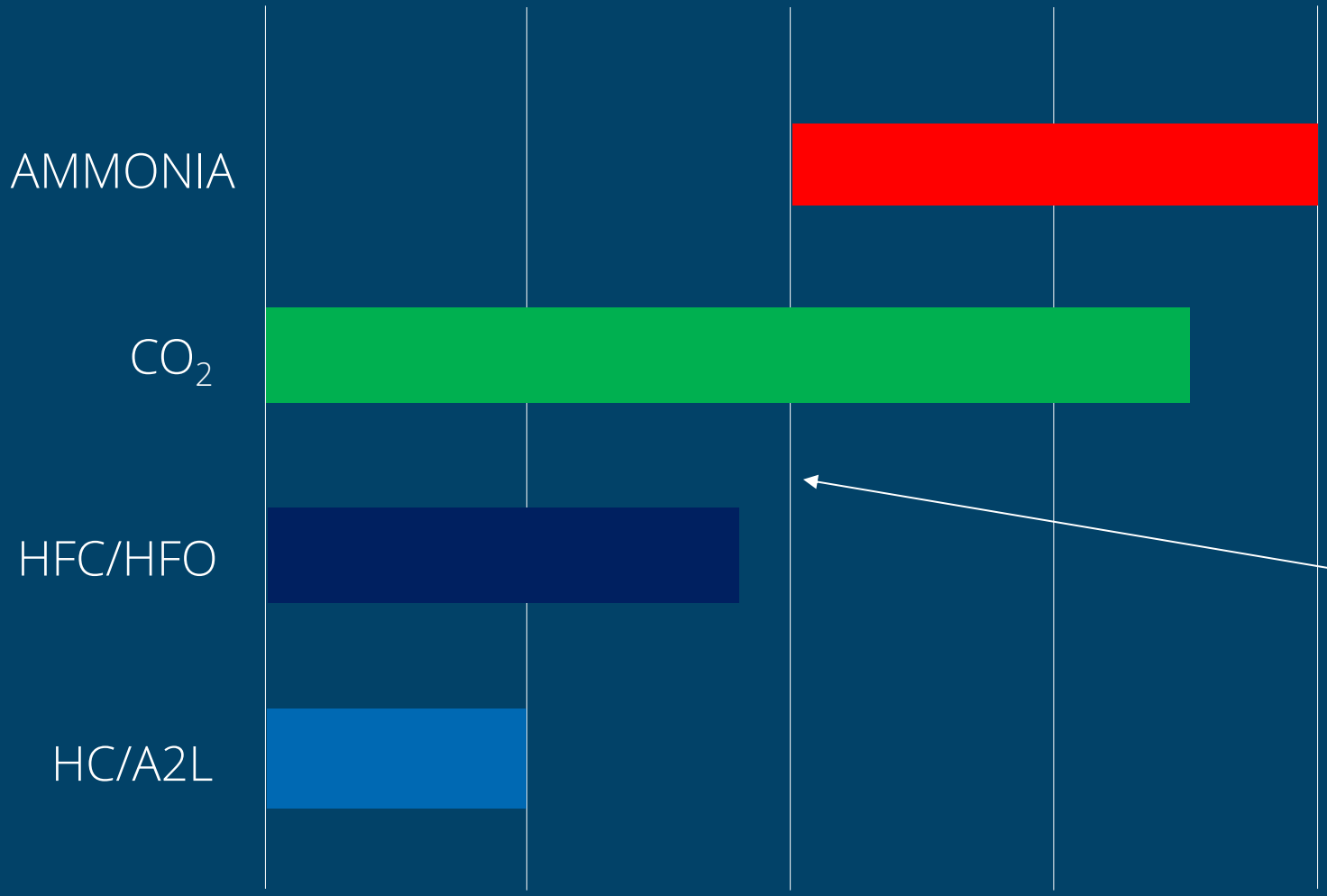
- **Commercial Refrigeration:** Supermarkets, convenience stores, food retail
- **Industrial Cooling:** Food processing, pharmaceutical storage
- **HVAC Systems:** Energy-efficient heating & cooling solutions
- **Heat Pumps:** High-efficiency sustainable heating applications
- **Fully integrated systems**



WHY USE CO_2 AS A REFRIGERANT ON A RACKS?

- Compatible with most materials (non corrosive)
- High Volumetric Cooling Capacity: CO_2 has a high volumetric refrigeration capacity (6 times higher than R404A) resulting smaller compressors, components and pipe work
- High heat transfer coefficients and High thermal conductivity:
  - operate with 2K higher evaporating temperature Vs. HFC
  - operate with small approach on gas cooler and PHE
- High thermal conductivity and low viscosity in liquid and suction lines (small pressure losses) improve heat exchanger efficiency, reducing the size of evaporators and condensers
- Smaller Piping and Valves: due to its high density, piping diameters can be smaller than those for traditional refrigerants

CAPACITY

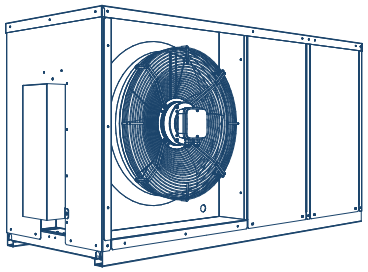


CO_2 bridges the gap between larger HFO/HFC single rack and smaller Ammonia plant.

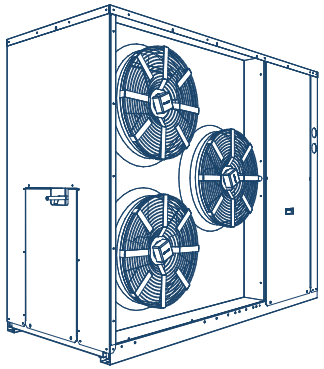
<150kW 150-500kW 500kW-1MW >1MW

CO_2 RANGE

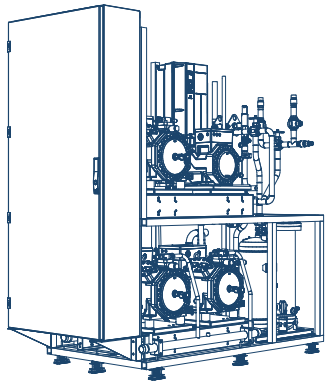
A solution for *all applications*



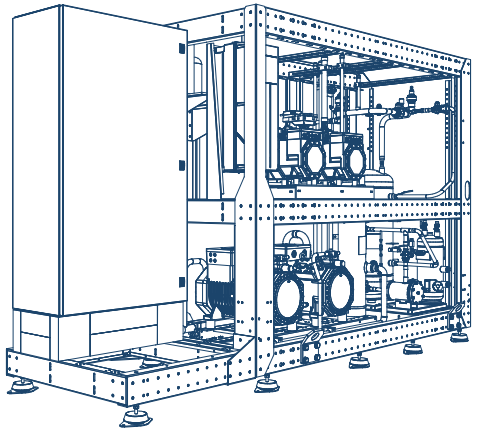
CUBO 2 SMART



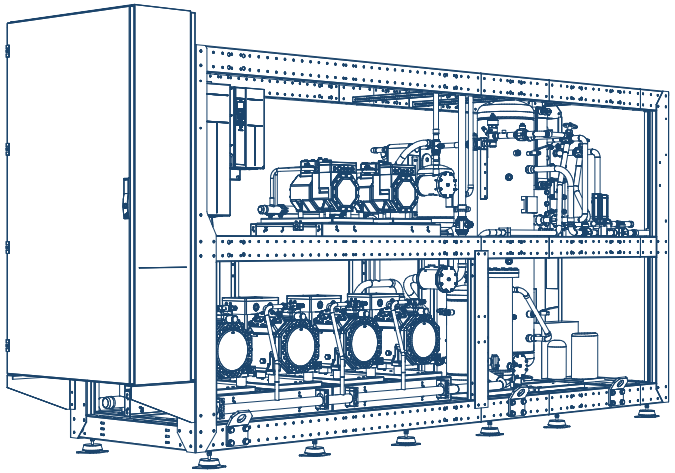
CUBO 2 PLUS



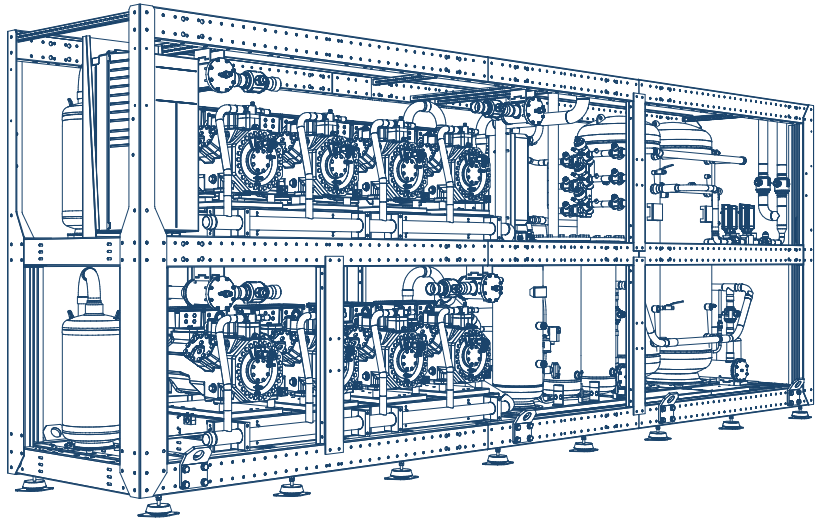
SMART BOOSTER



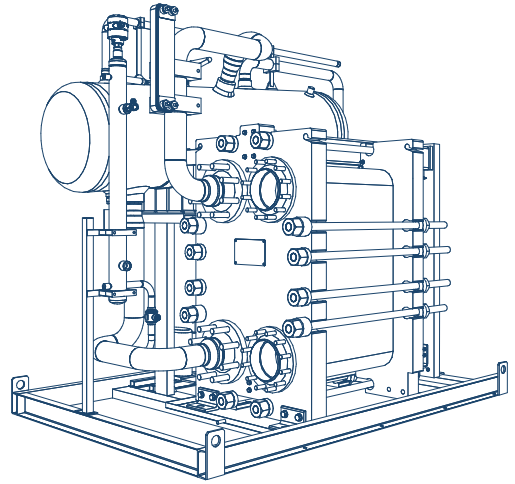
LEAN BOOSTER



BOOSTER



BOOSTER



CHILLER

PRODUCT PORTFOLIO - CO_2 COMMERCIAL SEGMENTS

RANGE	APPLICATION	REFRIGERATION CAPACITY	OPTIONS FOR HIGH AMBIENT CLIMATE	OPTION TO INCREASE EFFICIENCY
$CUBO_2$ Smart	MT LT	0,6 – 8,5 kW 0,8 – 7,9 kW	Adiabatic Kit	
$CUBO_2$ Plus	MT LT	3,8 – 37 kW 1,5 – 13 kW	Adiabatic Kit	
SMART Booster	MT MT+LT	15 – 70 kW 2 – 15 kW	Adiabatic Kit Chill booster LP Ejector	Liquid ejector MT
LEAN Booster	MT LT MT + LT MT + IT + LT	15 – 160 kW 3 – 55 kW	Adiabatic Kit Chill booster LP Ejector Parallel compression Mechanical subcooler	Liquid ejector MT
Booster MWT	MT LT MT + LT MT + IT + LT	15 – 700 kW 15 – 400 kW	Adiabatic Kit Chill booster Paralle compression Vapour and Liquid Ejector Mechanical subcooler	Liquid ejector Evaporator overfeeding MT/LT

CUBO2 SMART

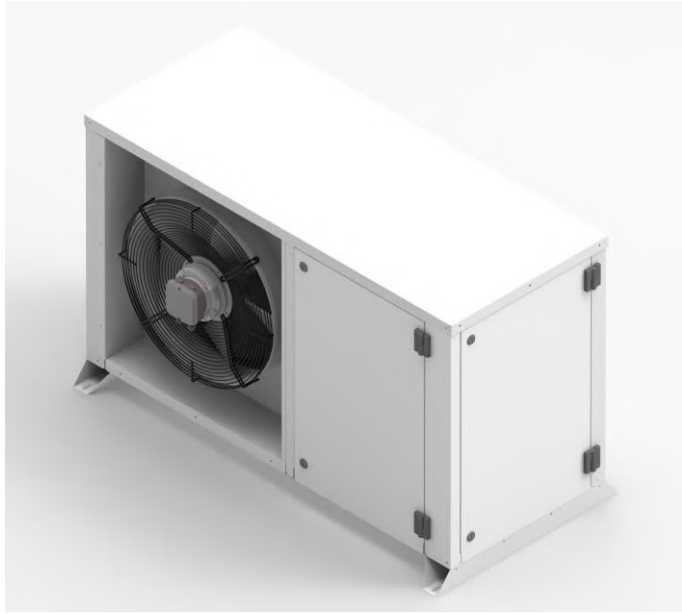
ECO design Compliant

MT from 0,6 kW to 8,5 kW @ -8°C SST
LT from 0,8 kW to 7,9 kW @ -30°C SST

CUBO2 SMART is a range of condensing units using CO2 as refrigerant, for application in medium and low temperature equipped with the following technologies:

- Rotary Compressor with BLDC motore of Toshiba (single or 2 stage)
- Inverter modulation 25 - 100%
- Carel controller
- EC gas cooler fan
- PS 130/80/80 bar
- Liquid receiver 8 or 12 litres depending on models.

Options:
Adiabatic kit
Oil management kit
Water cooled gas cooler
Low noise version (33 dB(A))



CO_2 REFRIGERANT | EFFICIENT SOLUTION | LOW NOISE | SMALL FOOTPRINT | EASY START-UP | DC BRUSHLESS ROTARY COMPRESSOR | GAS COOLER EQUIPPED

CUBO2 PLUS

ECOdesign Compliant

MT from 3,8 kW to 37 kW @ -8°C SST
LT from 1,5 kW to 13 kW @ -30°C SST

CUBO2 PLUS is a range of condensing units using CO2 as refrigerant, for application in medium and low temperature equipped with the following technologies:

- Semi-hermetic compressor (MT: Bitzer – Dorin; LT: Dorin 2 stage)
- Inverter modulation 60-140%
- Varistep modulation 10-100% (only for Bitzer)
- Oil management kit
- EC gas cooler fan
- Carel / Danfoss / RDM / Wurm controller
- PS 130/80/80 bar
- Liquid receiver 15 liters

Options:
Adiabatic kit
Water cooled gas cooler
Liquid receiver 37 liters

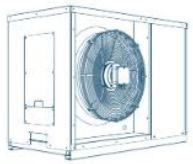
- CO_2 REFRIGERANT
- EFFICIENT SOLUTION
- LOW NOISE
- SMALL FOOTPRINT
- EASY START-UP
- DC BRUSHLESS ROTARY COMPRESSOR
- GAS COOLER EQUIPPED

CUBO2 SMART CUBO2 PLUS

CALCULATION SOFTWARE

There is software available online to determine the total charge of refrigerant and oil

CUBO2 SMART



Cooling Capacity:
MT from 0,6 kW up to 8,5 kW
BT from 0,65 kW up to 7,9 kW

$CUBO_2$ Smart is an high efficiency condensing unit (for CO2 transcritical application) equipped with BLDC variable speed compressor.
It is compact, easy to install and can directly communicate with the refrigerated units.
Thanks to these features it is a very efficient (even at partial load) without any compromise with the food conservation.

DOWNLOAD BROCHURE

CO2 CHARGE CALCULATION V4.0

CUBO2 PLUS

Cooling Capacity:
MT from 4,6 kW up to 34 kW
BT from 1,1 kW up to 12,5 kW

Design is compact and units are easy to install and maintain.
Units are equipped with gas cooler and electrical panel, tested and factory programmed for an easy start-up.

DOWNLOAD BROCHURE

CO2 CHARGE CALCULATION CUBO PLUS V1.1

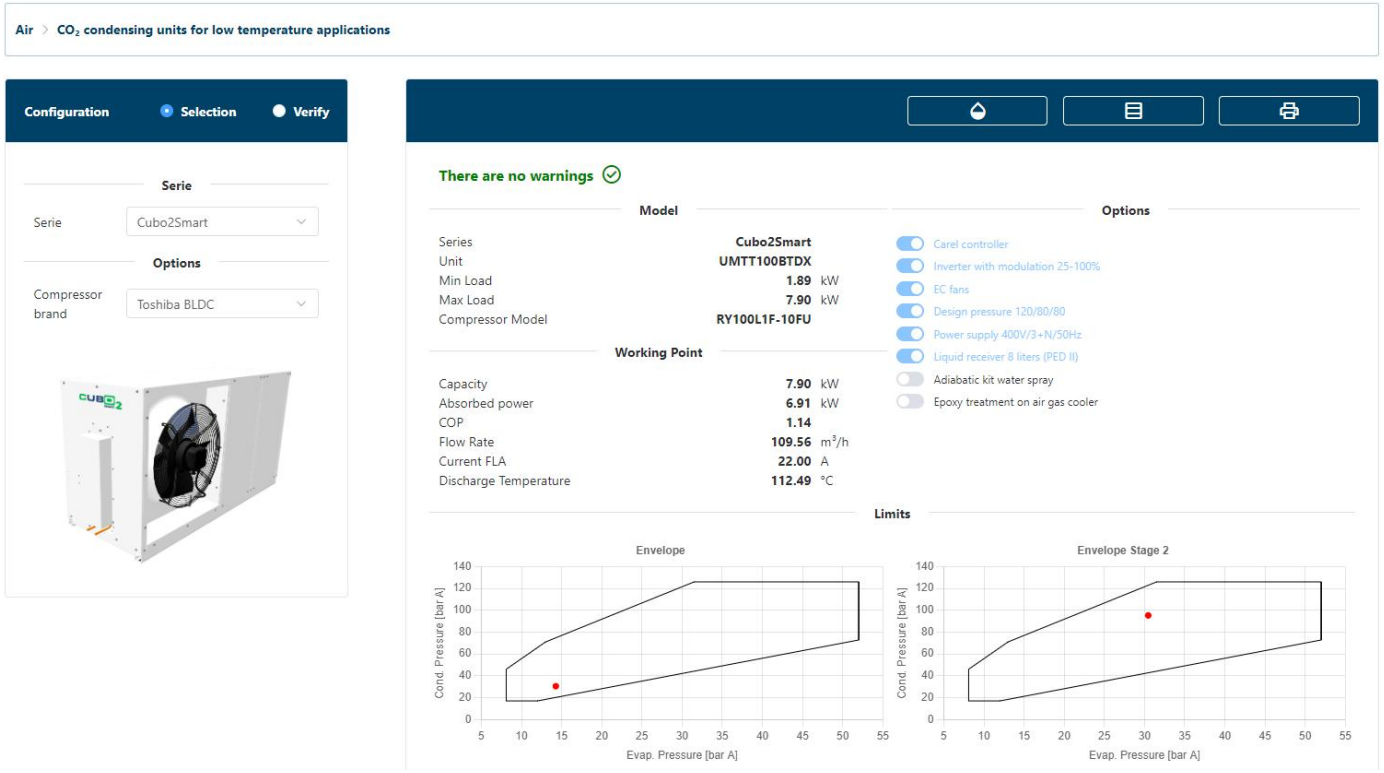
$CUBO_2$ Smart/AQUA Refrigerant Charge Calculator V 4.0

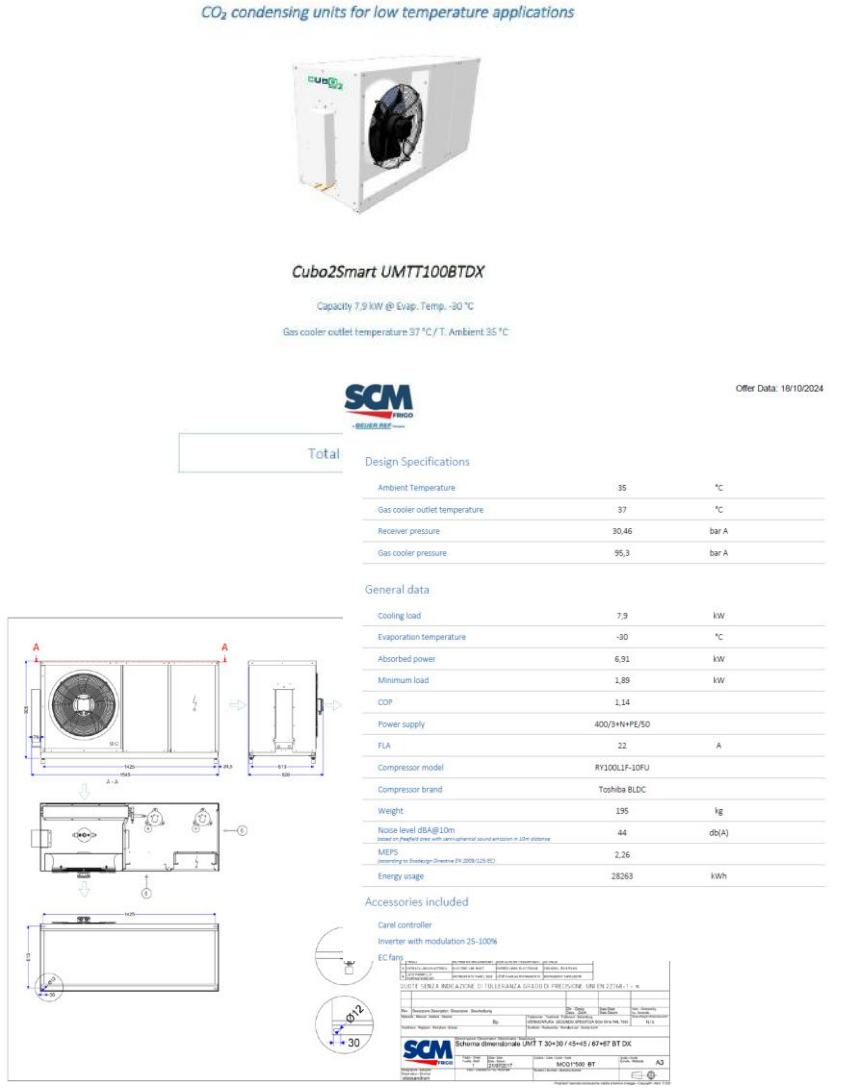
UNIT MODEL		Cubo2 Smart	
Liquid Receiver model		8 L	
Use & fill out ONLY the yellow cells			
Pipework		**Metres**	**kg**
LIQUID LINE			
Liquid Line 3/8" (120 bar K65)		0	0,00
Liquid Line 1/2" (120 bar K65)		0	0,00
Liquid Line 1/2" (80 bar K65)		0	0,00
Sub Total Liquid			0,00
SUCTION LINE			
Suction Line 3/8" (120 bar K65)		0	0,00
Suction Line 1/2" (80 bar K65)		0	0,00
Suction Line 1/2" (120 bar K65)		0	0,00
Suction Line 5/8" (80 bar K65)		0	0,00
Suction Line 5/8" (120 bar K65)		0	0,00
Sub Total Suction			0,00
STANDING CHARGE			
Receiver			2,40
Gas Cooler/ PHE			1,30
Sub Total CUBO			3,70
EVAPORATORS			
Evap 1	dm3 (Litres)	0	0,00
Evap 2	dm3 (Litres)	0	0,00
Evap 3	dm3 (Litres)	0	0,00
Sub Total Evaps			0,0
Total Charge (minimum charge is 4kg)	kg	3,70	ok
Pumpdown from E2V MUST BE ≤ 7.2kg for 8L and ≤ 3.5 for 2x2,4L	kg	2,40	ok
Pumpdown from CU Liquid Outlet ≤ 7.2kg for 8L and ≤ 3,5 for 2x2,4L – If not fit ball valves on branch lines	kg	2,40	ok

CUBO2 SMART CUBO2 PLUS

CUBO2 Selection Software

It is available online a software to select CUBO2 smart and Plus and to calculate the required refrigerant and oil charge required for the good operation of the unit. (Registration required)



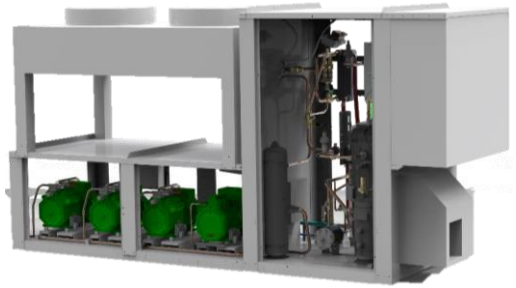


SMART BOOSTER

Smart Booster (MWS) is a line of compressor rack using CO_2 as refrigerant for application in medium and low temperature equipped with the following technology:

- Welded frame
- Maximum configuration with up to 5 compressors (3 MT / 2 LT)
- Capacity modulation on MT compressors with Varistep 10 - 100%
- Controlo Carel / Danfoss / RDM / Wurm
- PS 120/80/60/60 bar
- CO_2 liquid receiver volum: 105 L – 150 L (option)

COMPACTNESS and low CUSTOMIZATION



With integrated gas cooler

MT from 16 kW to 70 kW
BT from 2,0 kW to 15 kW

Options: frequency inverter LT / LP Ejector / Heat recover PHE + 3way valve / power meter / Suction filters / resilience unit R134a or R290/130 bar design

Low Noise box 32 db(a)

L: 17000 mm
W: 800 mm
H: 1990 mm

L: 2450 mm
W: 800 mm
H: 1990 mm

LEAN BOOSTER

MT from 15 kW to 160 kW
BT from 3,0 kW to 55 kW

LEAN Booster (MWL + UMCE) is a line of compressor rack using CO_2 as refrigerant for application in medium and low temperature, using the following technology:

- Semi-hermetic compressors
- Configuration with max 4 compressors MT (1 IT) and 3 compressors LT
- Parallel compressor available for warm ambient application/AC load
- Inverter on leading MT compressor or Varistep modulation 10 - 100%
- Control Carel / Danfoss / RDM / Wurm
- PS 120/60/52/30 bar
- CO_2 Liquid receiver: 124 L / 170L / 281 L
- High efficiency / Maintenance free oil separator
- Danfoss HP/MP valves
- Access to all components and electrical board from the front side.
- 3 frames with different dimensions

With integrated gas cooler

Options: Frequency inverter LT / 2 stageheat recovery with 3 way valves / LP Ejector / Liquid Ejector / Suction filter MT and LT installed / back up controller

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SMKT BOOSTER

MT from 15 kW to 700 kW
BT from 15 kW to 400 kW

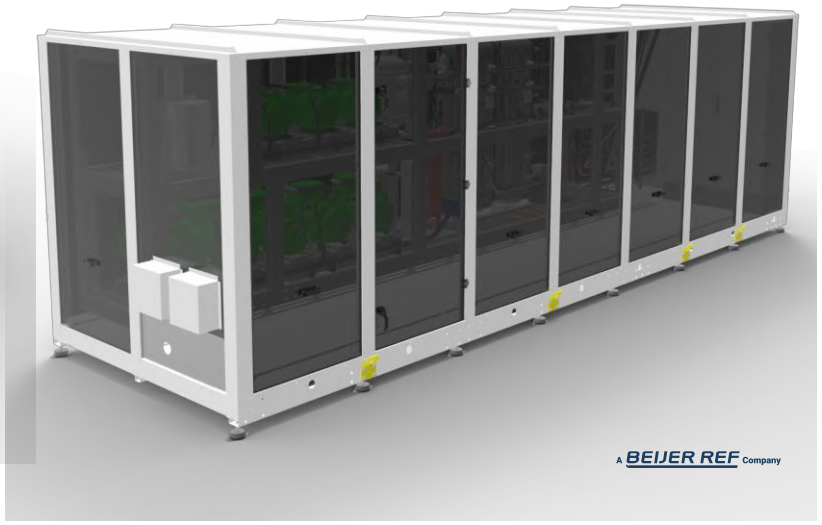
Booster (MWT + UMCE) is a line of compressor rack using CO_2 as refrigerant for application in medium and low temperature equipped with the following technology :

- Semi-hermetic compressors
- Max flexibility in configuration and number of compressors to fit all the applications
- Frequency inverter on leading MT compressor or Varistep modulation 10 - 100%
- Control Carel / Danfoss / RDM / Wurm / Dixell / PLC
- Oil management with coalescent oil separator, oil reservoir and traxoil on the compressors.

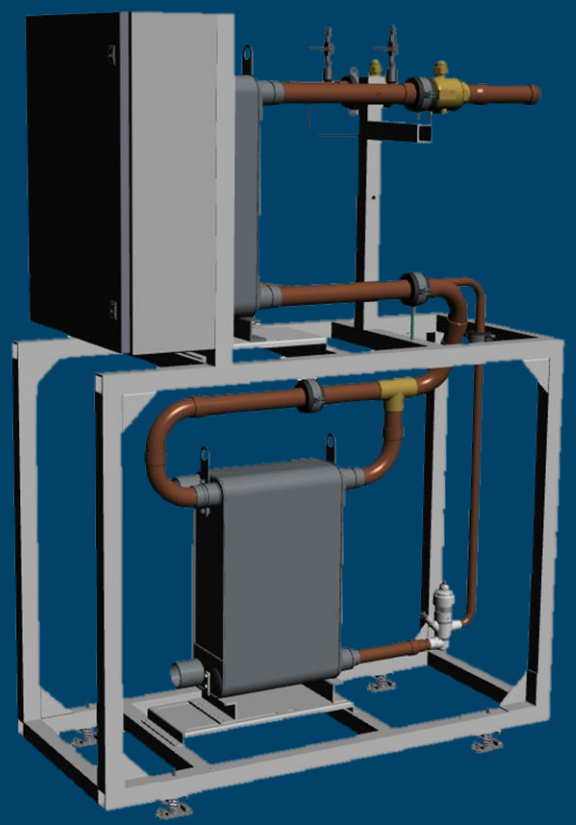
Options: frequency inverter on LT compressors / 2 stages heat recovery with 3 way valves / Energy meter / parallel compressor / air conditioning load / multi-ejector liquid/vapour

Plug' n cool – With integrated gas cooler

Walk-in – For outdoor installation



CHILLER MODULE

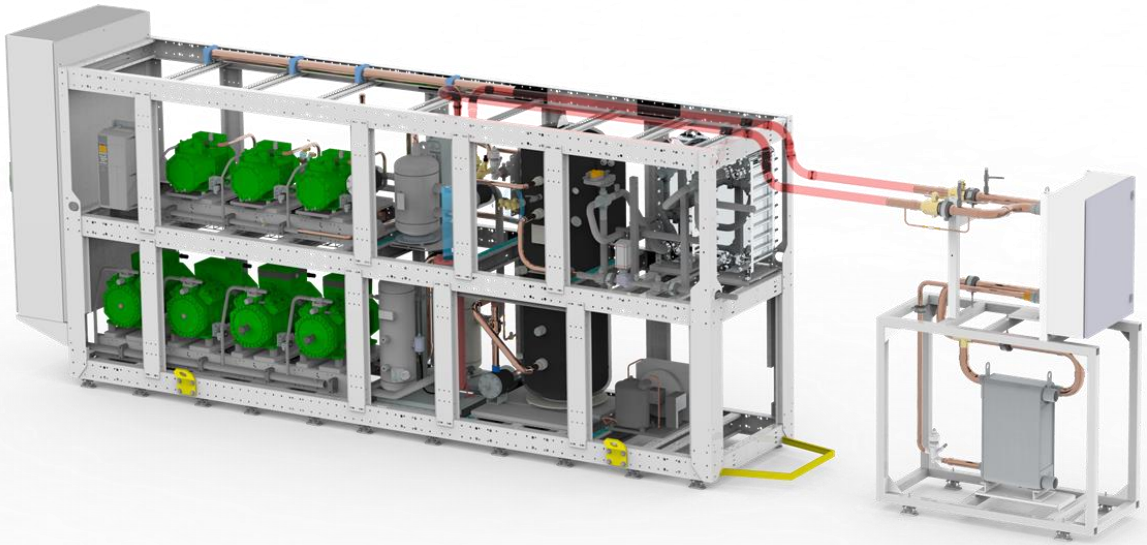


MT from 25 kW to 250 kW

Chiller MODULE is a line of chiller aggregate using CO_2 as refrigerant for the cooling of a secondary brine in medium temperature application (brine temperature from -15 to +20°C) equipped with the following technology:

- Direct ecpansion Brazed plate heat exchanger
- Electronic expansion valve
- Additional IHX (Liquid /Suction) heat excchanger
- Superheat and brine Control Carel/Danfoss

The module is a stand alone module that can be connected with any of the range of transcritical unit and is suitable for cooling water or non corrosive brines.



MT from 50 kW to 500 kW

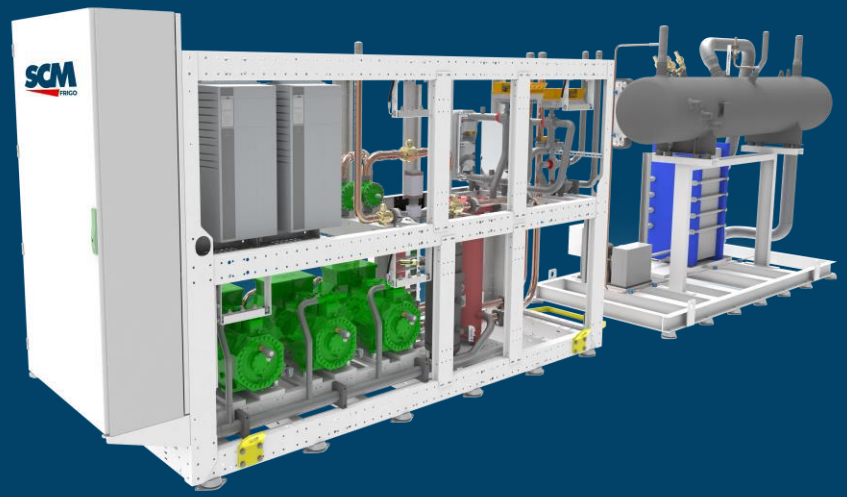
CHILLER COMMERCIAL

Chiller COMMERCIAL is a line of chiller rack using CO_2 as refrigerant for the cooling of a secondary brine in medium temperature application (brine temperature from -15 to +20°C) equipped with the following technology:

- Semi-hermetic compressors
- Frequency inverter on leading MT compressor or Varistep modulation 10 - 100%
- Control Carel / Danfoss / PLC
- Oil management with coalescent oil separator, oil reservoir and traxoil on the compressors.
- Flooded Brazed plate heat exchanger installend on the unit frame

Options: 2 stages heat recovery with 3 way valves / Energy meter / water gas cooler

CHILLER INDUSTRIAL

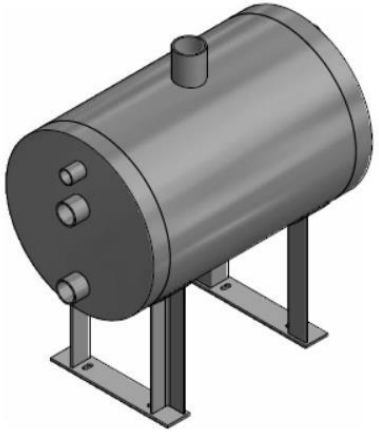


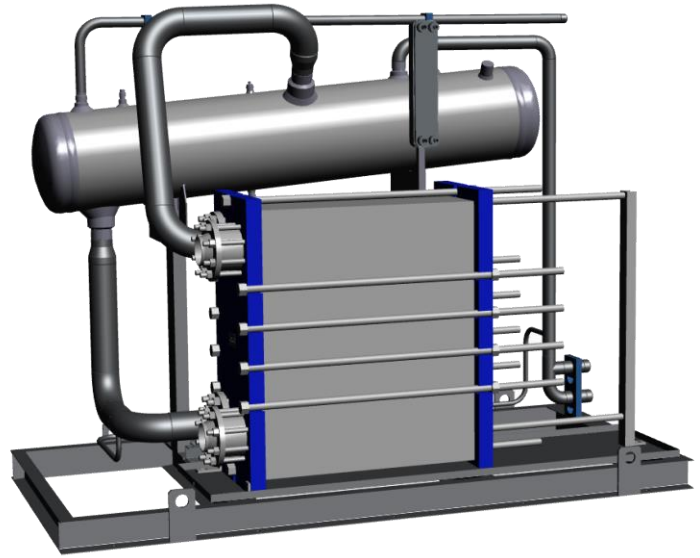
MT from 200 kW to 1000 kW

Chiller INDUSTRIAL is a line of chiller rack using CO_2 as refrigerant for the cooling of a secondary brine in medium temperature application (brine temperature from -15 to +20°C) equipped with the following technology:

- Semi-hermetic compressors
- Frequiency inverter on leading MT compressor or Varistep modulation 10 - 100%
- Control Carel / Danfoss / PLC
- Oil management with coaleshent oil separator, oil reservoir and traxoil on the compressors.
- Flooded semiwelded or shell& plate heat exchanger installend on a separate frame
- Suitable for corrosive fluid
- SEMI WELDED and SHELL AND PLATE heat exchangers

Options: 2 stages heat recovery with 3 way valves / Energy meter / water gas cooler / parallel compression / Vapor Ejector





INDUSTRIAL
BOOSTER

Booster INDUSTRIAL is a line of high capacity booster rack using CO_2 as refrigerant for the cooling of users in medium and low temperature specifically design for Industrial application equipped with the following technology:

- High capacity / high efficiency semi-hermetic compressors
- Frequency inverter on leading MT compressor or Varistep modulation 10 - 100%
- Control Carel / Danfoss / PLC
- Oil management with coaleshent oil separator, oil reservoir and traxoil on the compressors.
- Welded frame modelled with FEA analysis
- FLEXIBILITY

MT from 300 kW to 1550 kW
LT from 100 kW to 800 kW

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LT from 15 kW to 500 kW

CO_2 UMCE CASCADE

UMCE is a line of subcritical cascade units using CO_2 as refrigerant for application in Low temperature equipped with the following technology:

- Semi-hermetic subcritical compressors
- Liquid receiver design to meet the installation requirement
- Control Carel / Danfoss / Dixell
- Oil management with oil separator with integrated reservoir and traxoil on compressor
- Cascade condenser
- PS 52/30bar

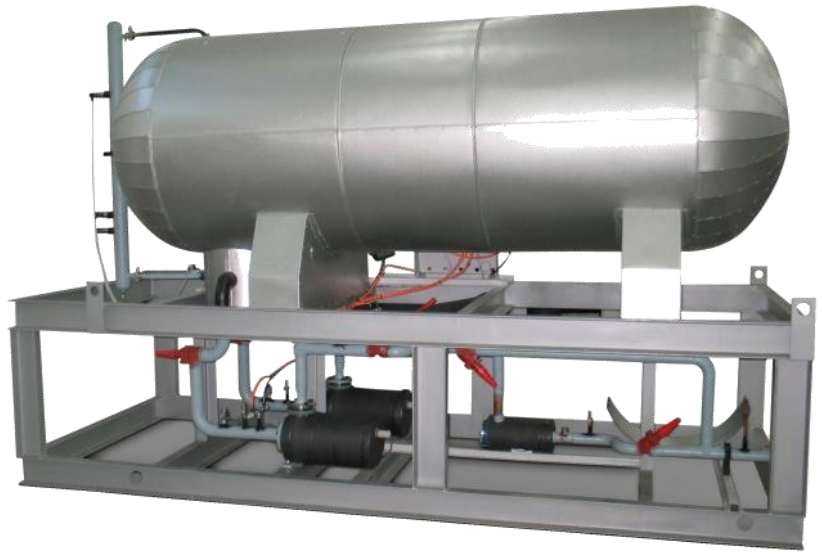
Options: resilience unit / PS 60 bar / Energy meter / Inverter on leading compressor

CO_2 PUMP STATION

Pump STATION is a line of pump module using CO_2 as refrigerant for application in Medium and Low temperature application equipped with the following technology:

- Canned motor Hermetic Pumps
- Liquid receiver design to meet the installation requirement
- Control Carel
- Oil management with oil rectification system to be connected with the refrigeration unit
- Available vessels capacities 600 / 800 / 1200 / 1600 / 2300 / 3500 liters
- PS MT 40 bar / PS LT 30 bar

Options: resilience unit / PS 60 bar / Energy meter / Inverter for pump modulation / Polyuretan insulation with aluminum cladding



BEIJER REF

ACADEMY

Your Global Eco-Friendly Regrigerant Training Program

Become a CO_2 Specialist

Beijer Ref Academy will offer technicians and installers ***the opportunity to learn how to operate CO_2 refrigeration systems in different configurations***, from condensing units to complete racks with parallel compression, and the latest generations of ejectors, among other options. This will simulate the performance of CO_2 in all applications and weather conditions.

Typical training session *Day 1*

THEORETICAL COURSE

- Properties of CO_2;
- Safety issues with CO_2 ;
- Transcritical Cycle and main component descriptions;
- Components overview;
- Warmer climate application:
  - Adiabatic gas cooler;
  - Parallel compression;
  - Mechanical subcooling;
  - Vapour ejector;
- Overfeed system;
- CO_2 Systems in Transcritical application:
  - Booster MT/LT;
  - Booster Only LT;
  - Booster “full integrated”;
  - Pump recirculation System MT and LT;
  - Chillers;
  - Condensing units;
- Defrost with CO_2 ;
- Heat recovery with CO_2 ;

PRODUCTION TOUR

Typical training session *Day 2*

PRACTICAL TRAINING SESSION

- Refrigeration circuit and main components of transcritical system;
- PID and identification of components on real units;
- Electrical cabinets:main components;
- Inverters. Description of common set up;
- HPV and MPV valves: explanation of their operation;
- Parallel compressors: purpose and operation;
- Ejectors: purpose and operation;
- CO_2 and oil: quality and type required;
- Start-up of systems: charging gas procedure;
- Main features of controllers. Hands-on (on request);
- Overview of a running unit with simulation of different states of operation;
- Recommended maintenance and service;

DELIVERY of the CERTIFICATE

Thank You!