



ATMO
sphere



CO₂ transcritical FTE System Full Transcritical Efficiency

ECO₂  FTE

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EPTA Natural Refrigeration Systems



ECO₂ Small

EPTACLIMA

ECO₂ Large

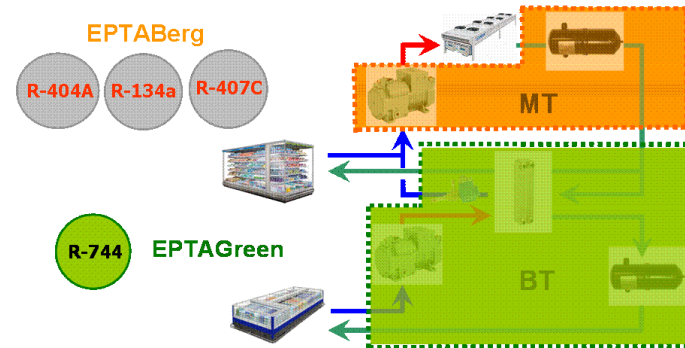
E+E
Epta Educational



Existing CO2 stores in Asia

CO ₂ Cascade Systems in Asia					
Retailer	Fairprice Xtra	Fairprice Finest	Fairprice Xtra	Metro Cash & Carry	Metro Cash & Carry
Country	Singapore	Singapore	Singapore	China	China
Store Location	Changi Biz Park	Balestier (Zhong Shan Park)	JEM	Tianjin	Zhengzhou

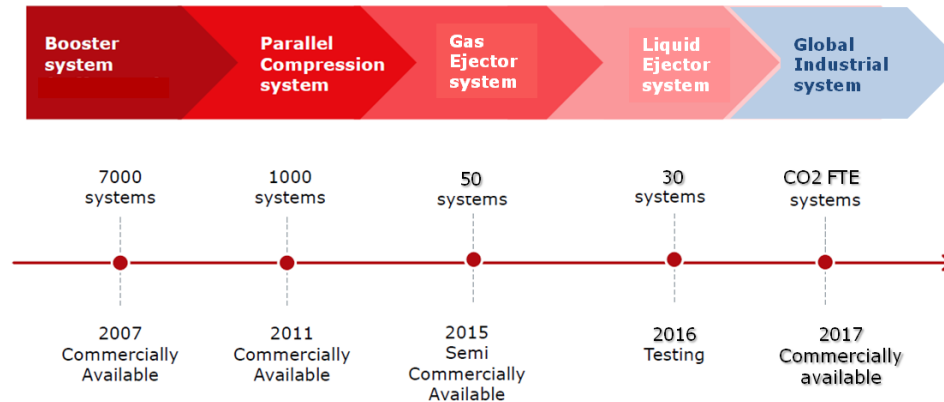
EPTAGreen Cascade System



CO₂ transcritical FTE System

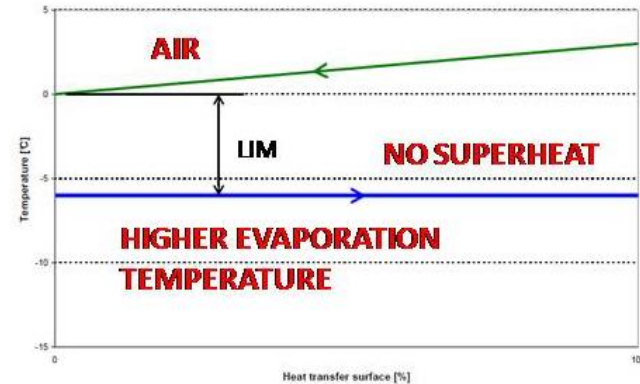
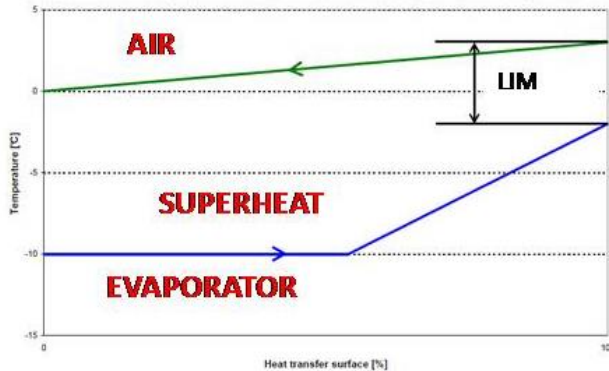
New highly innovative CO₂ transcritical solution that combines low costs, energy saving and reliability in any country, with any external temperature

Warm climates available solutions



- » **Parallel compression system** : a dedicated VSD compressor removes the flash gas from the liquid receiver thus increasing the efficiency with Text > 25°C
- » **Gas ejector system (requires parallel compressor)** : device that pumps the vapor exiting from MT evaporators back to the liquid receiver. Provides limited energy saving *only in summer time*
- » **Liquid ejector system (requires gas ejector and parallel compressor)** : device that pumps the liquid exiting from MT flooded evaporators from a low pressure receiver back to the intermediate pressure receiver. The overfeeding of evaporators allows higher evaporation temperature and the corresponding energy saving can be relevant, but *only in summer time*.
- » **Multi ejector technology (gas and liquid) with parallel compression is limited by its complexity, the high cost of components not commercially available and the need to have highly qualified staff to commission and optimize the system.**

Overfeeding of the evaporators



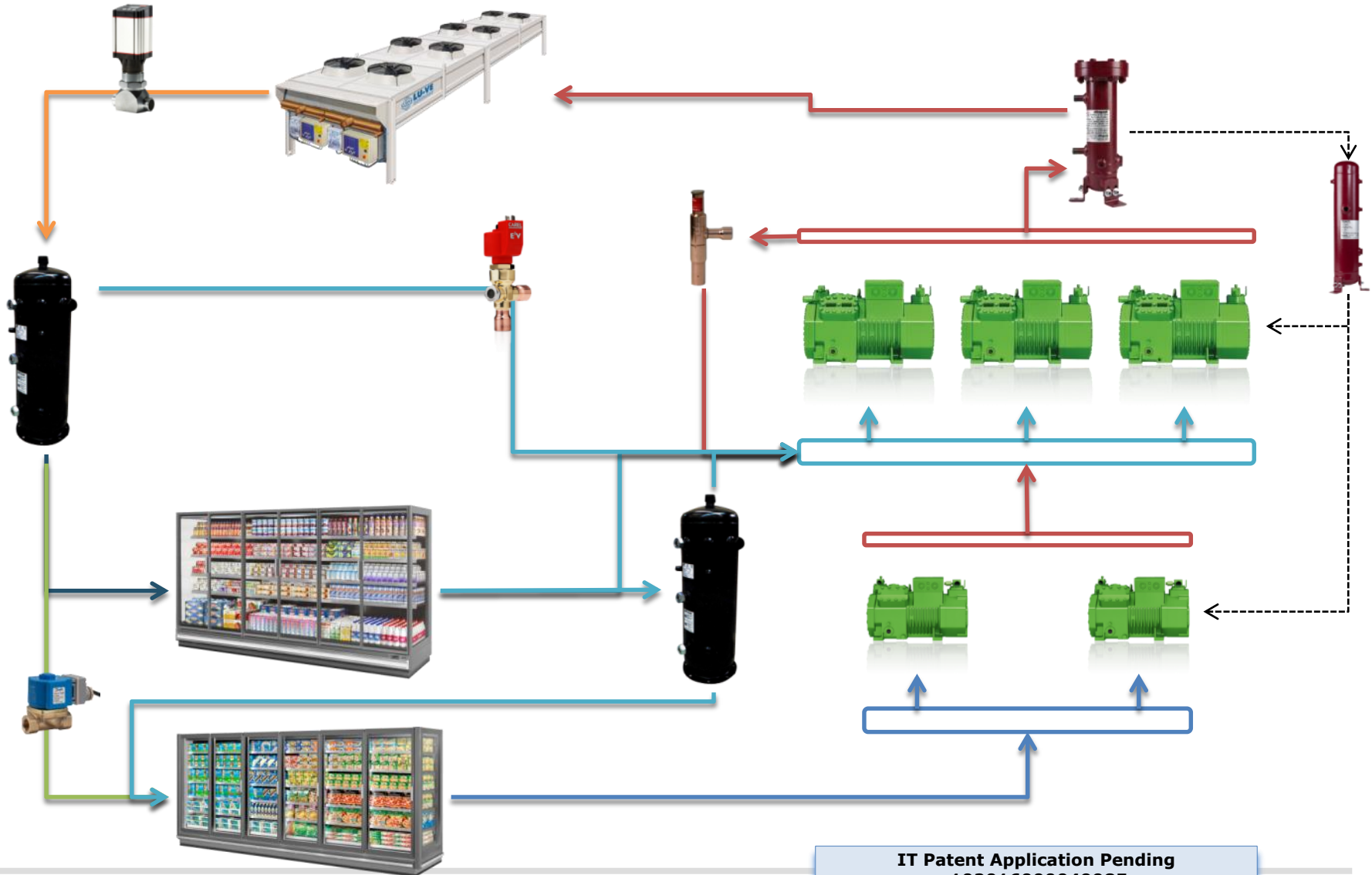
- » **What is the superheat?** The amount of heat added to the refrigerant after its complete evaporation.
The superheat is necessary to have only vapor at the evaporator outlet, but it also introduces a significant energy waste and higher compression work.
- » **Superheat and Evaporating Temperature** The maximum evaporating temperature is limited by the approach between the air inlet temperature and the refrigerant temperature at evaporator outlet.
Superheat causes lower evaporation temperature and hence higher energy consumption.
- » **ZERO superheat : overfeeding of evaporators** Superheat is completely eliminated, liquid refrigerant is mostly used at the evaporator, liquid and vapor are present at the MT evaporator outlet
- » **Advantages of evaporators overfeeding** Higher evaporation temperature (up to 6K), liquid refrigerant ensures excellent heat transfer



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CO₂ TRANSCRITICAL FTE SYSTEM



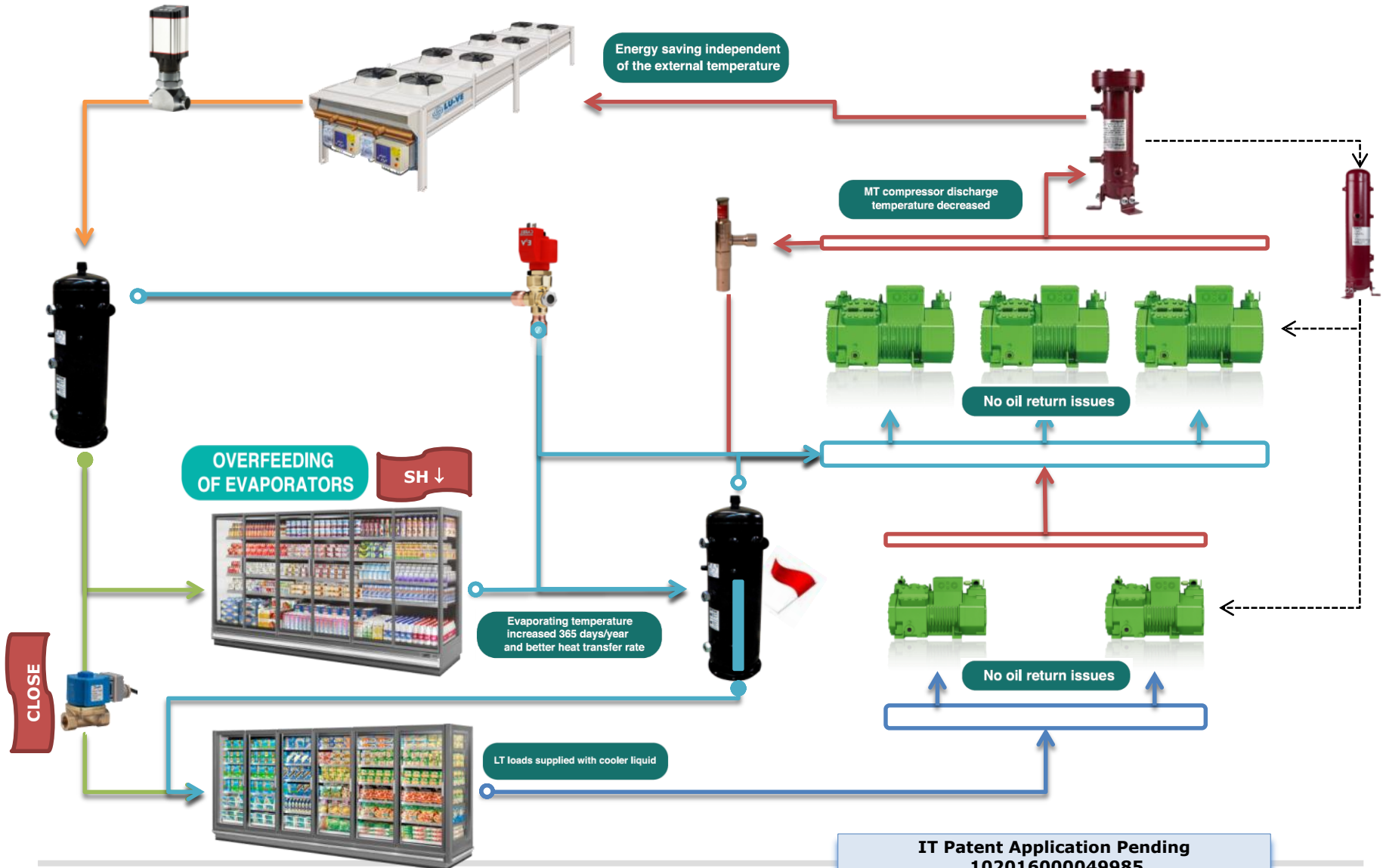
IT Patent Application Pending
10201600049985



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CO₂ TRANSCRITICAL FTE SYSTEM



IT Patent Application Pending
102016000049985



FTE Advantages

1. Evaporating temperature increased 365day/year

The efficiency of the CO₂ FTE SYSTEM is given by the MT cabinets operating with flooded (overfeeding) evaporators without superheat

Evaporation temperature is increased up to 6K (2.5-3% energy saving per K)

2. Energy saving is independent of the external temperature

Unlike ejector technology, the FTE system works in energy saving mode with flooded evaporators all year long

3. Optimal performance at EVERY temperature

The absence of superheat decreases the discharge temperature of the compressors considerably, making it the ideal system for every climate.

4. LT loads supplied with cooler liquid

Liquid to the LT freezers is subcooled after MT cabinets

5. No oil return issues

Perfect lubrication is ensured as the oil circuit is uninterrupted

FTE Key features

FTE combines simplicity with outstanding performance:

- » **Energy Saving : 10%**
on an annual basis, independent of the latitude and the climate
- » **Installation and maintenance cost savings: UP TO 20%**
as it requires no ejector or parallel compression and is intrinsically very reliable

Simply available everywhere...NOW!



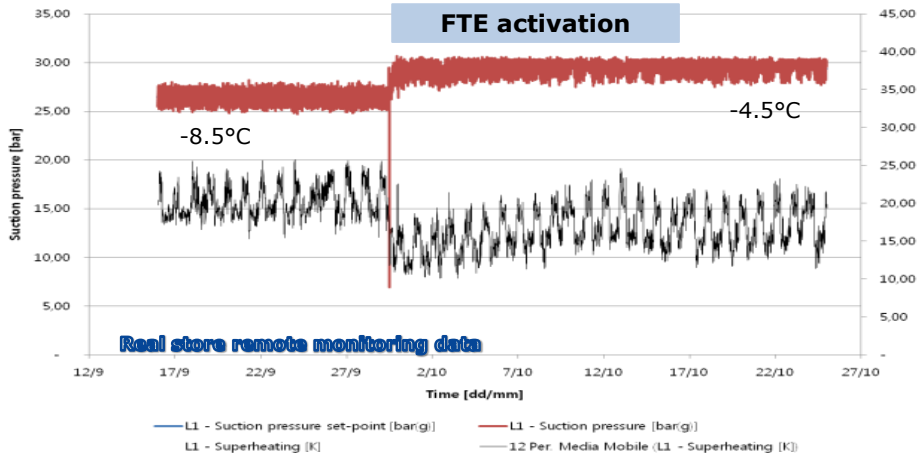
FTE Key features

GLOBAL

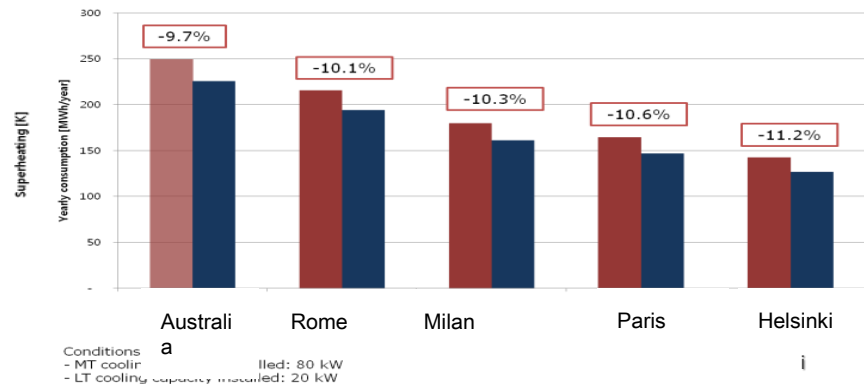
as it works perfectly in hot climates but offers the advantage of a dramatic reduction in consumption all year in any location

One solution for all markets, sustainable and efficient everywhere, and does not require any special expertise.

Evaporating temperature increased



Energy saving independent of the external temperature



FTE Key features

SIMPLE

because it does not need ejectors or sophisticated components, it is as simple as a standard basic CO₂ booster system

Mechanically the FTE system operates with the same components as the basic CO₂ transcritical system, plus the FTE multilevel liquid receiver.



FTE Key features

RELIABLE

as it is a modular solution based on standard components produced on a large scale: the MT and LT systems use standard CO₂ cabinets and freezers, the power pack is a standard basic CO₂ booster system, whereas the heart of the system is the FTE module, an intelligent standard multi-level liquid receiver.

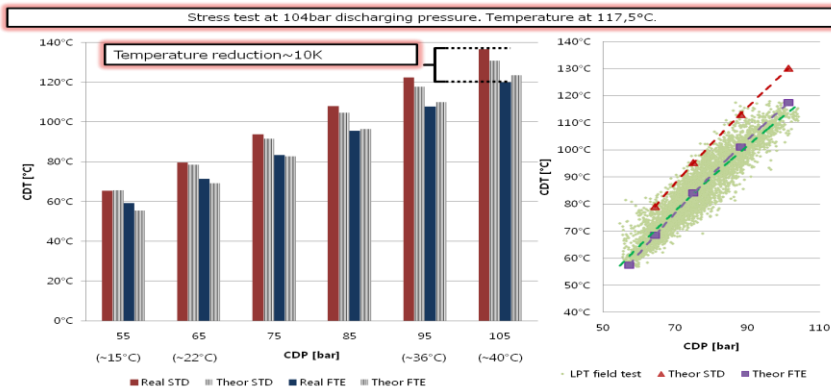


FTE Key features

RELIABLE

finally a CO₂ booster system solution moresafe and robust than ever, because the FTE system reduces the compressor discharge temperature and allows perfect oil circulation providing better lubrication.

MT compressor discharge temperature decreased








Certificate

This is to certify that

Epta

has developed a

highly innovative, energy-efficient CO₂ solution with reliable BITZER compressors, which maintains an uninterrupted cold chain in all climate conditions

The transcritical Epta FTE (Full Transcritical Efficiency) system introduces a simple method to introduce flooded evaporators in commercial applications. This leads to a significant reduction of the difference between evaporation and display cabinet temperatures in the optimised mode and thus lower energy consumption.

Especially in combination with ECOLINE+ reciprocating compressors, BITZER sees the new FTE technology as a major step in the right direction towards the environmentally friendly use of refrigerants in commercial refrigeration, combined with energy efficiency in high ambient temperature regions. The FTE solution is reliable and resistant under all operating conditions, no matter whether it is used in warm or cold areas.

We would like to thank Epta, the expert in commercial refrigeration, for its innovation as well as for being a great collaborative partner and hope to carry on working together to create a successful future.



Erik Bucher
Director Sales Refrigeration

Sindelfingen, 15 February 2017

Conclusions

FTE is a business model :

- » **INDUSTRIALIZE**
- » **RELIABLE**
- » **EFFICIENCY**



The future of natural refrigeration depends on systems that combine **cost, energy saving and reliability** in a simple design.

With CO₂ FTE SYSTEM the **cost, performance and reliability** gaps can finally be seen to be bridged.

FTE gives a significant contribution to **break down the barriers** to a natural future in refrigeration.



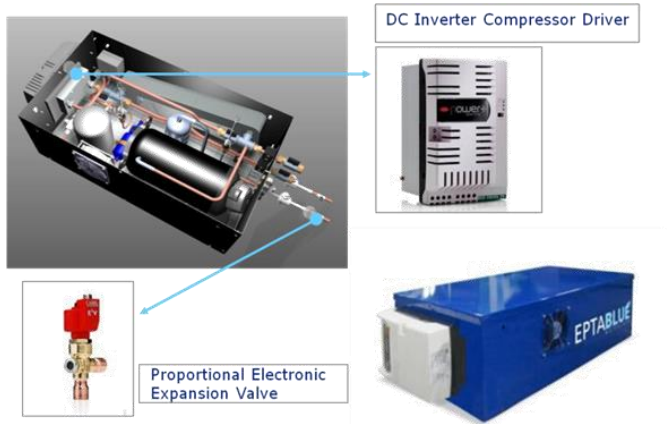
Compact intelligence

High Efficiency System Technology

Waterloop system

- In the last years the commercial refrigeration industry has determined a huge shift toward natural refrigerants requiring the improvement of unit cost and efficiency
- The main key success factor is the simplicity of implementation, safe, reliable and industrial solutions that simplify installation and service, thus breaking the barriers of concern related to human skills
- Directives like ECODSIGN address reduction of energy consumptions and consequently reduction of indirect emission. SEER/SCOP performance assessments show that off-design condition accounts for most of the time
- Improving the TEWI (Total Energy Warming Impact) of installations brings a beneficial financial effect linking together the choice of refrigerant, performance and cost of the solution
- Commercial Refrigeration systems, during real usage, are subjected to huge variations of thermal loading conditions, mostly dependent on climate area, customer usage and HVAC store management, as well as the use of the cabinets, the opening from shopper, food loading, light dimming, etc.
- Frequency controlled variable speed motors applied to waterloop systems offer practical way to achieve maximum performance all the year /all the day adapting themselves to the different field condition

Waterloop system

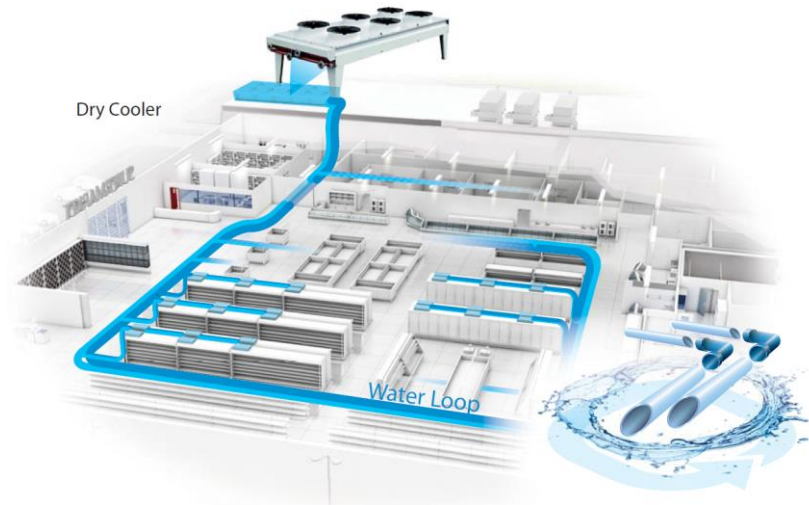
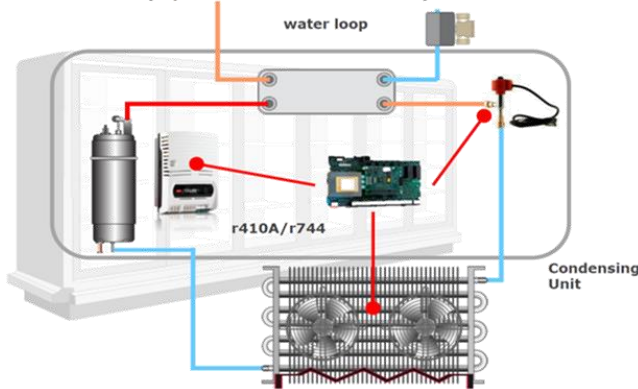


STORE LAYOUT

Simple, economical and practical

- ✓ Single loop for MT/LT
- ✓ No subcooling chiller
- ✓ No technical room nor installation work
- ✓ No perceptible noise
- ✓ No equipment outdoor
- ✓ Warm climate version and new extended limits
- ✓ Freezing protected up to -25°C (glycol)

CONCEPT (system schematics)



EPTABLUE WATERLOOP **Waterloop system**



Waterloop system

ENERGY EFFICIENCY

- All units always at their best working condition
- Wide modulation range and energy efficiency at part load
- Optimum food temperature control
- Full control of units: preventive diagnostic and maintenance

FLEXIBILITY

- Easy layout change and showcases repositioning,
- Wider sales area, less space needed for machine room
- High investment recovery in store relocation
- Low installation and maintenance cost

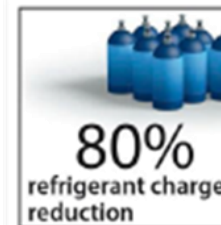
ENVIRONMENT RESPECT

- Charge reduction **80%**
- Leaks reduction **96%**
- TEWI reduction of more than 50% due to 96% direct effect reduction (in case of HFC)

**A FULLY COMPREHENSIVE
PRODUCT RANGE FOR
THE NEEDS OF ANY STORE FORMAT**



- High efficiency BLDC compressors
- Individual evap. temperature
- Fully controlled performances



- No long copper pipes
- No comp rack and receivers
- 1-2kg refrigerant charge for cabinets
- Leakage free as factory connected charged, sealed and tested



Bonnet Nèvé S.A. participates in the ECC programme for:
Refrigerated display cabinets (RDC); Check ongoing validity of
certificate online: www.eurovent-certification.com
or using: www.certiflash.com

