New Step of CO_2 Transcritical Unit for Industrial Refrigeration in Japan

Katsuhiko Harada
Nihon Netsugen Systems Japan

Company Profile

Tokyo Office

- Head office: Tokyo
- Factory: Shiga, Osaka
- Service Center: Tokyo, Osaka and Fukuoka
- Founded: 1987
- Products: AC Heat Pump, Industrial Refrigeration Chiller, CO_2 Chiller, Geo Thermal Heat Pump

Shiga Factory

Production Line

Production Line of CO_2 Units

- Start operation, December 2017

Show Room

CO_2 Building

Real Unit in Operation

Production Line

CO_2 Unit “SUPER GREEN”

CO2 SUPER GREEN

- 0℃ Type C-1 38kW, Type C-2 76kW
- -25℃ Type F-1 34kW, Type F-2 68kW

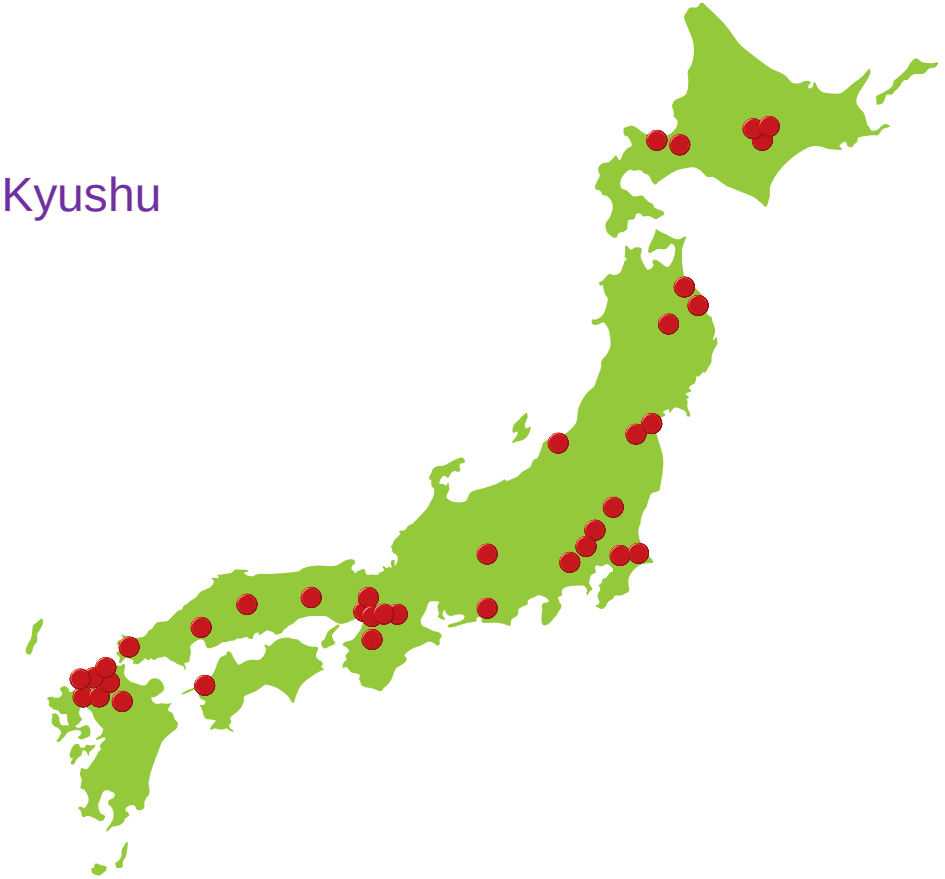
- Feature : Gas Cooler and Compressor Unit with One Box Design
  Gas Cooler Separate Type available
- Application : Cold Storage
  Logistics Center
  Freezer for Food Industry
  Margarine Production
  Supermarket

Nationwide References:

Nationwide References

North: Hokkaido to South: Kyushu

Total more than 120 units



Reference: Logistic Center

- End-user Kokubu Group Logistic Centers
- Location 4 Locations
  Saitama
  Chiba,
  Osaka (under construction)
  Hokkaido (under construction)

Chiba Funabashi Center: one box type x 6 units

Saitama Kawaguchi Center: separate type x 10 units

Reference: Milk and Dairy Factory

- End-user　Yotsuba Milk Products
  Milk and Dairy Factory in Hokkaido
- Specification　One Box Type and Unit and Gas Cooler Separate Type
  F-2(68kW) x 2unit　-25℃
  C-2(88kW) x 3unit　+5℃or +10℃
- Start Operation　Dec 2018

one box type x 3 units and separate type x 2 units

Tokachi Main Factory

本田冷蔵株式会社

Reference: Cold Storage

- End-user　Honda Reizo
  Cold Storage in Hyogo
- Specification　Unit and Gas Cooler Separate Type
  F-2(68kW) x 4unit　-25℃
  C-2(88kW) x 1unit　-5℃or -10℃
- Start Operation　Feb 2019

Taishi Factory

separate type x 5 units

Reference: Cold Storage

- End-user　Aoba Reito
  Cold Storage in Miyagi
- Specification　One Box Type
  F-2(68kW) x 9unit　-25℃
- Start Operation　Jan 2019

one box type x 9 units

Reference: Freezer

- End-user Nitto Best
  Frozen Food Factory in Yamagata
- Contractor Takahashi Industries
- Freezer Takahashi Industries
- Specification Σ300(45kW) Σ400(63kW)
- ET of CO2 -42℃
- Start Operation Oct 2018

Freezer Application
x 2 units

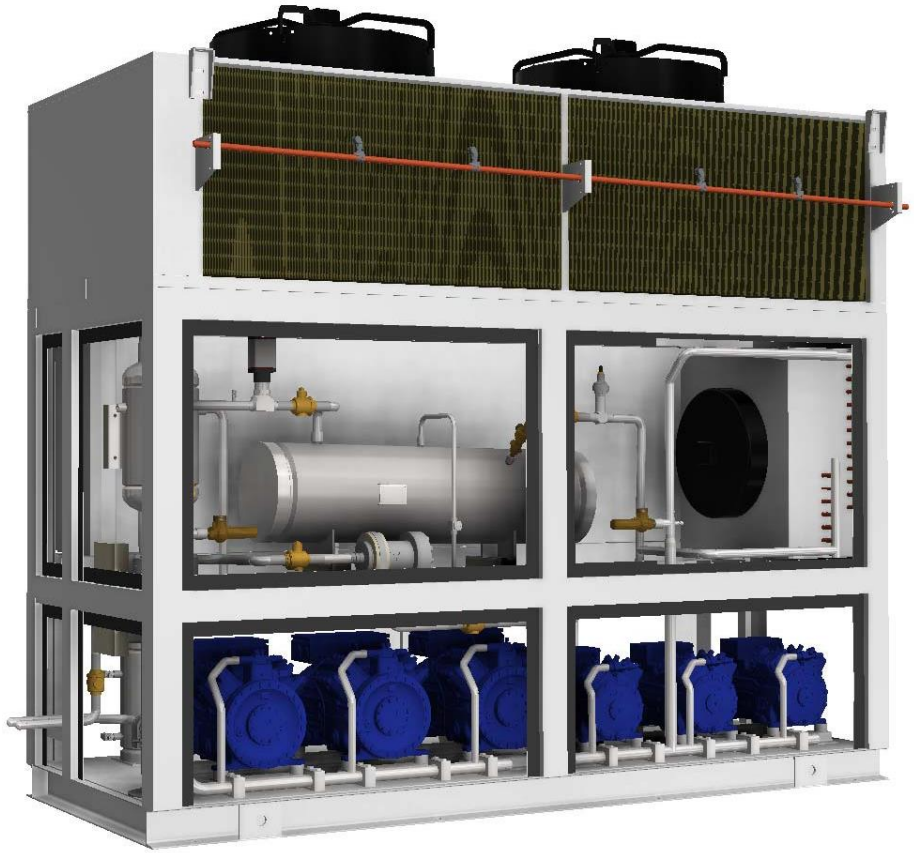
Reference: CO2 Brine Chiller

- End-user　Asahi Breweries
  Beer Factory in Fukuoka
- Specification　Brine Chiller Gas Cooler Separate Type
  B-3 (90kW) x 2units　-28℃
- Start Operation　Jan 2019

Hakata Factory

Brine Chiller x 2 units

New Product “Super Green” F-3



CO2 SUPER GREEN

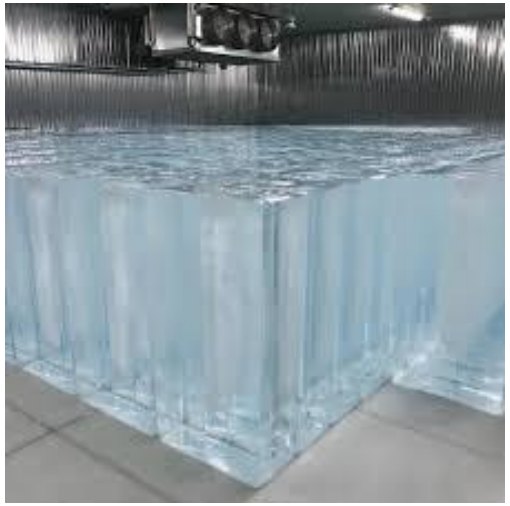
- -25℃ Type F-1 34kW, Type F-2 68kW

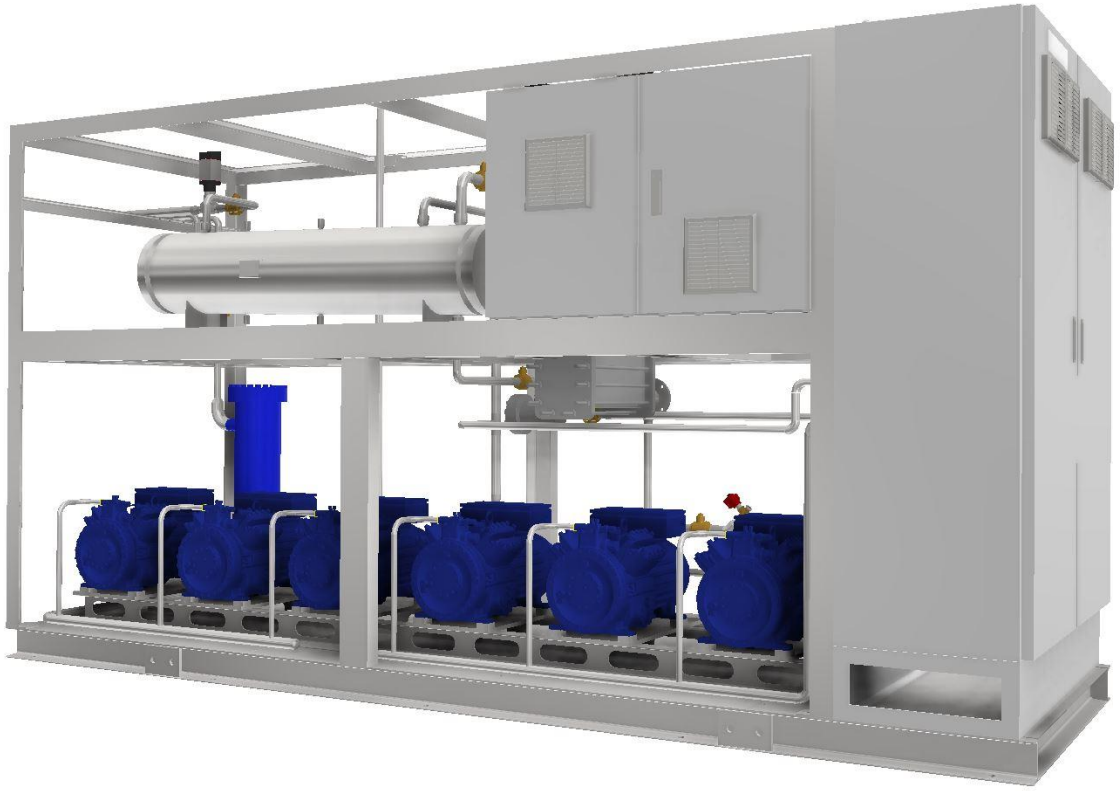
- -25℃ Type F-3 105kW 90HP

April 2019 Start Order Intake ⟶ Dec 2019 First Installation

New Product: Brine Chiller for Ice Industry

- Product Brine Chiller for Ice Industry
- Cooling Capacity 60-160kW
- Brine Output Temp -13 -20℃
- Type of Brine Calcium Chloride or Ethylene Glycol
- First Installation Autumn 2019





freor GÜNTNER

R290 Propane Cabinet plus Water Loop System for Supermarket

Katsuhiko Harada
Nihon Netsugen Systems Japan

About Freor

- Lithuanian Supermarket cabinet manufacturer
- One of pioneers for R290 cabinet and water loop system
- Market: Swiss, Germany, Nordic Countries and other European countries
- Company philosophy: thinking green; Environmental friendly products

thinking green

Propane R290 advantages

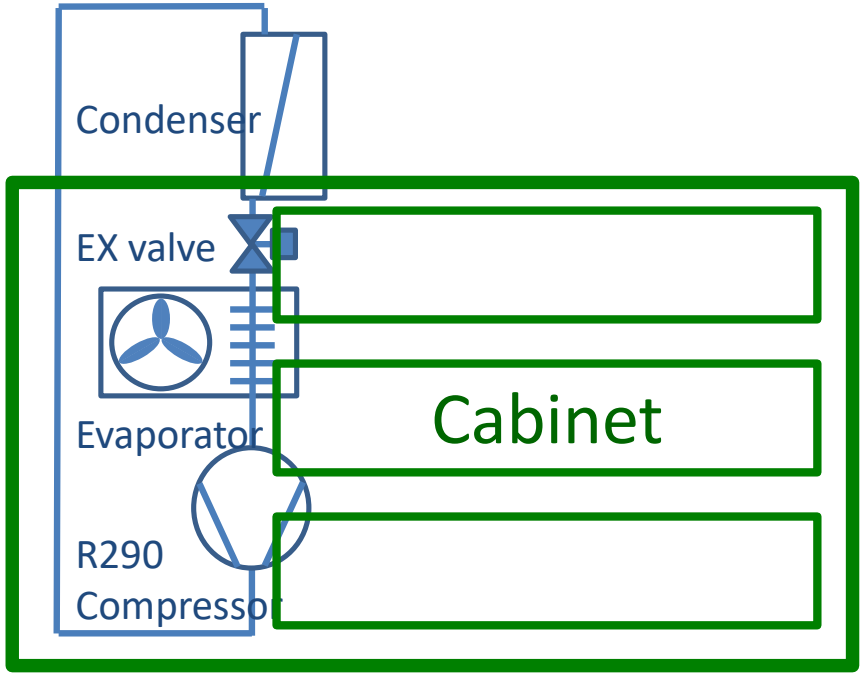
HFC

- R404A GWP=3920
- Ban the use of R404A from 2020 in EU
- Long term reduction target in Japan

R290

- R290 GWP=3
- Natural Refrigerant Zero ODP
- Out of target of reduction even for the future
- Excellent thermodynamic properties
  →Energy saving
- Low refrigerant charge compared with HFC

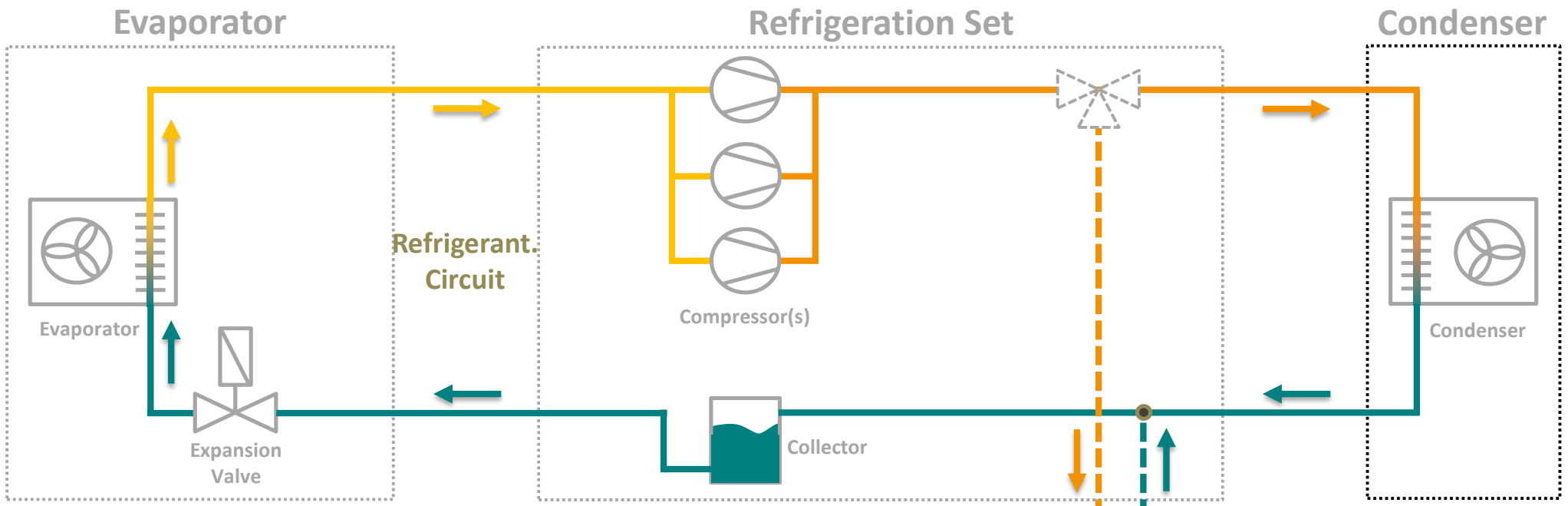
R290 Stand alone cabinet



- Stand-alone cabinet

- Hermetic refrigeration circuit built in the cabinet
- Single circuit ＜150g refrigerant charge
- Comply for international standard
- Large size of cabinet→ multiple refrigerant circuits
- Cabinet length 900-3750mm

Traditional Refrigeration System for Supermarket



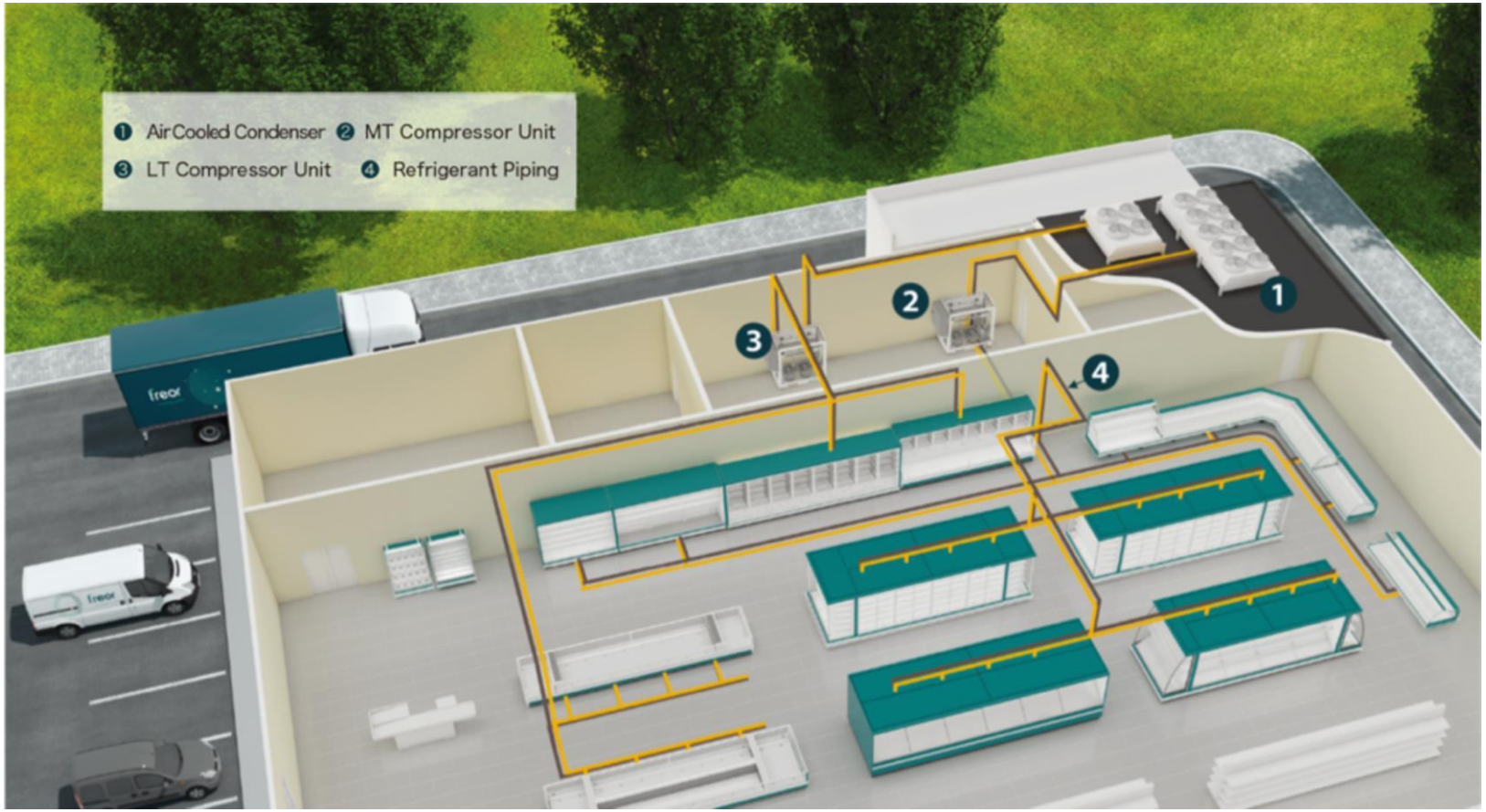
Showcase

Multi-Compressor Refrigeration System

Heat Recovery System (optional)

Gas Cooler

Traditional Refrigeration System for Supermarket



- Compressor unit in the machine room
- Air cooled condenser out of the store
- Refrigerant pipe connect between cabinets and compressor unit plus condenser

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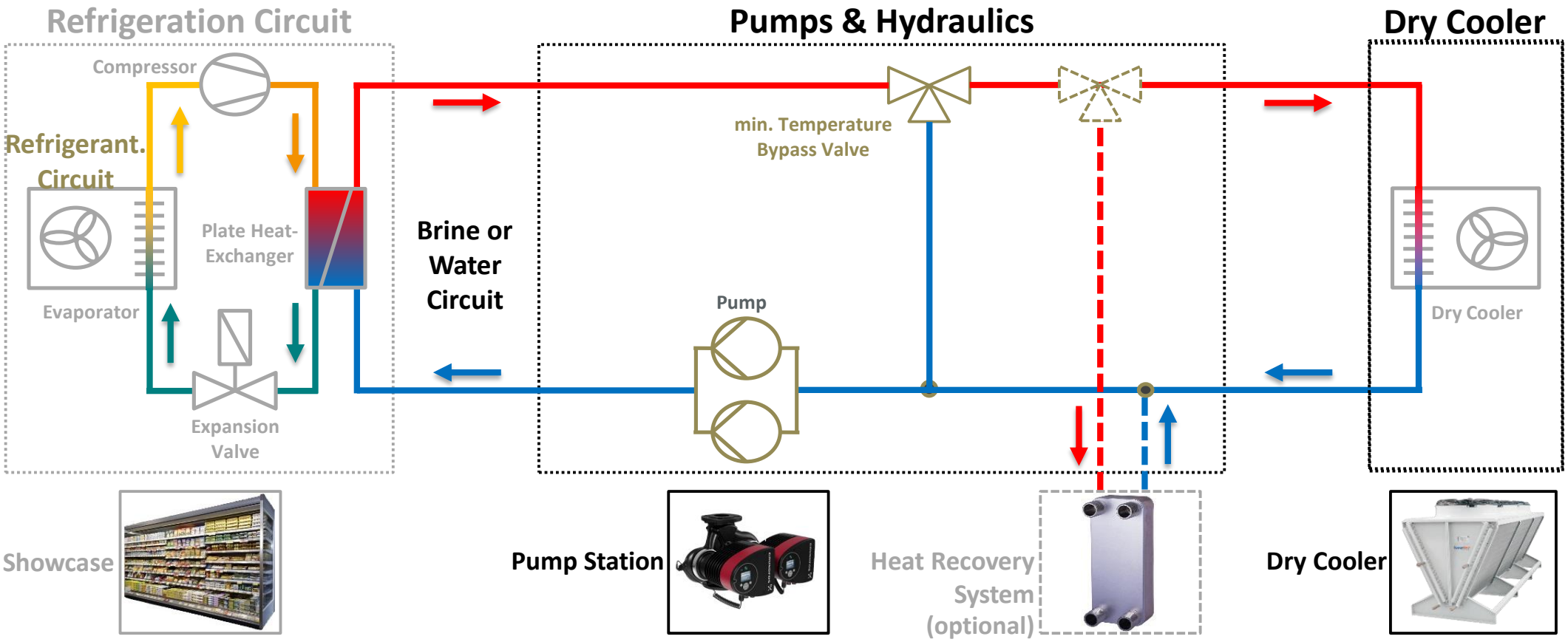
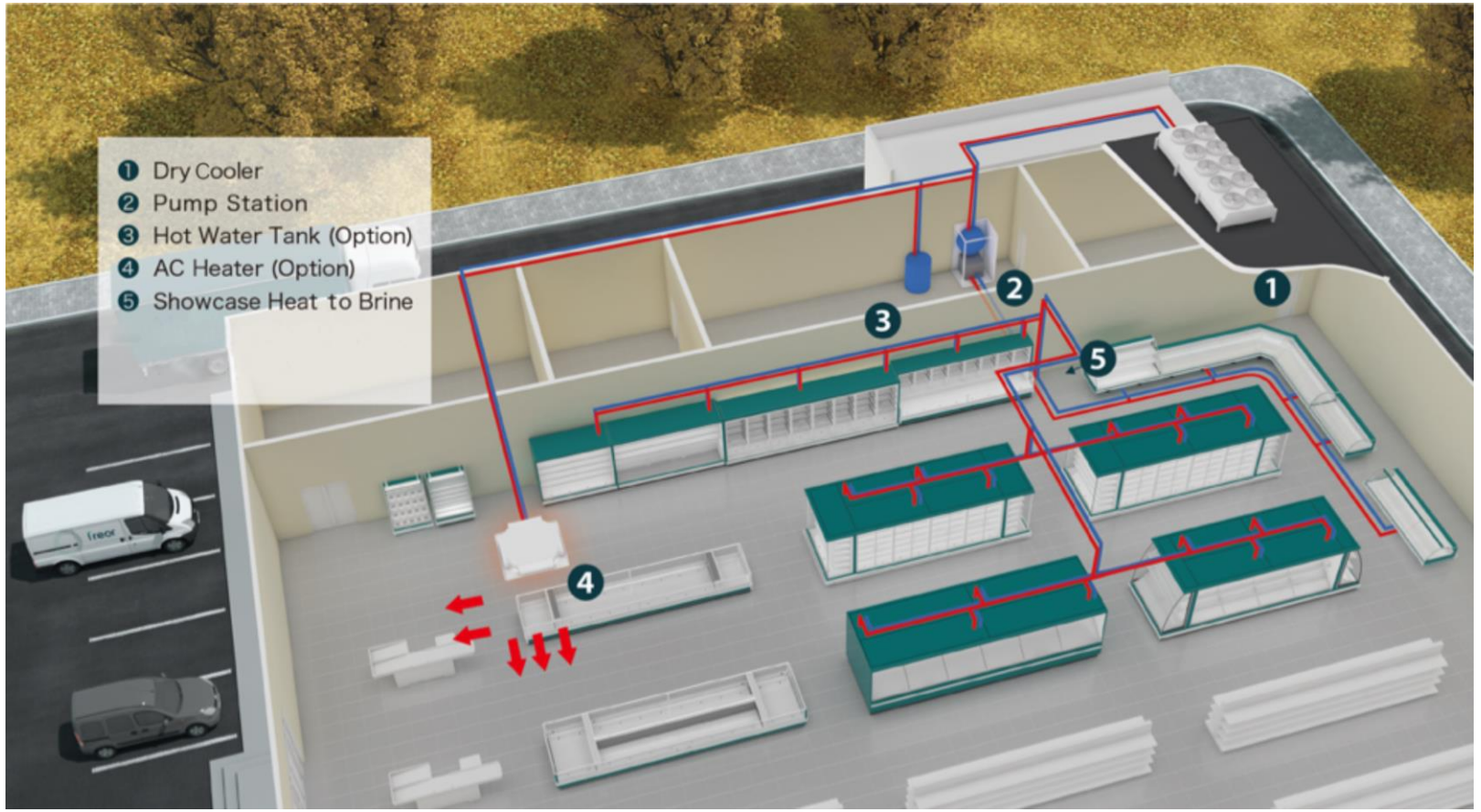
Water Loop with Glycol System



Water Loop with Glycol System



- No compressor unit no refrigerant pipe no pit
- Dry cooler and pump station out of the store
- Pump station circulate glycol to take condensing heat from each cabinet
- No heat discharge in the store
- Easy relocation or easy adding another cabinet
- More energy efficiency than HFC

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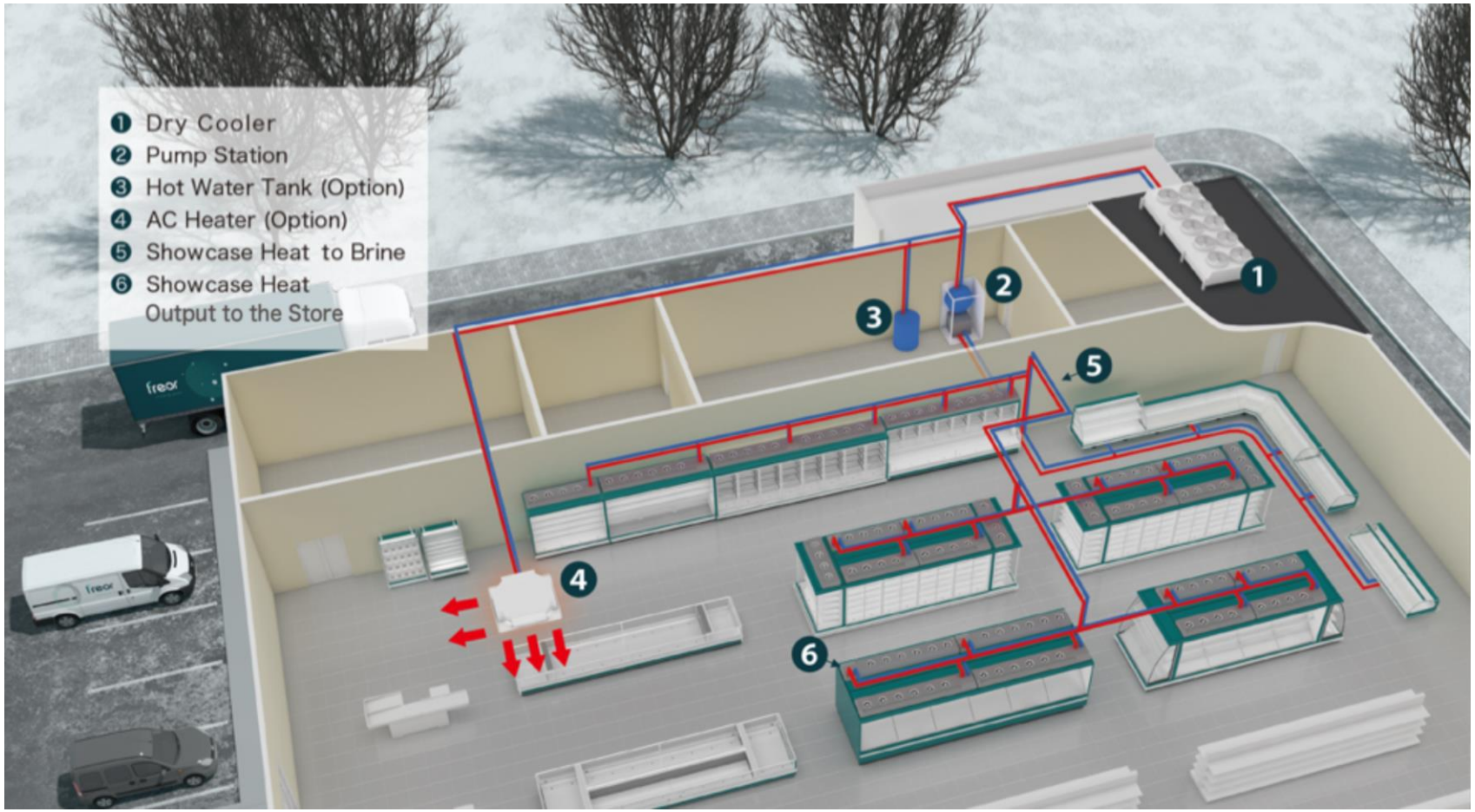
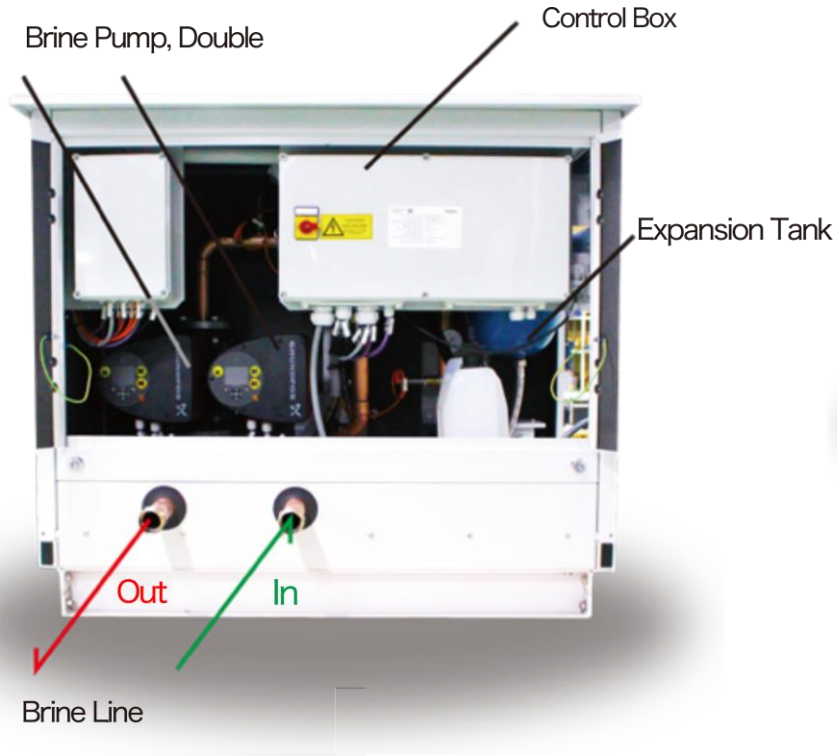
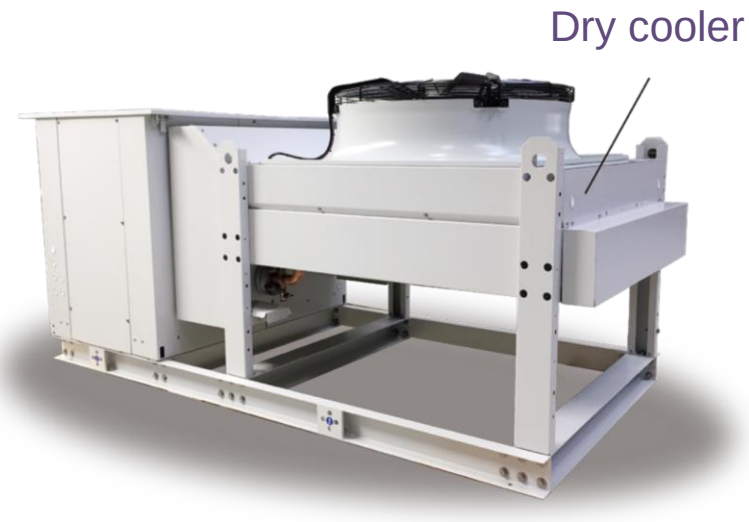
Water Loop Hybrid System



- Direct warm air supply to the store in winter
- Water loop system take discharge heat away from cabinets in summer
- Switchable system between warm air supply and water loop

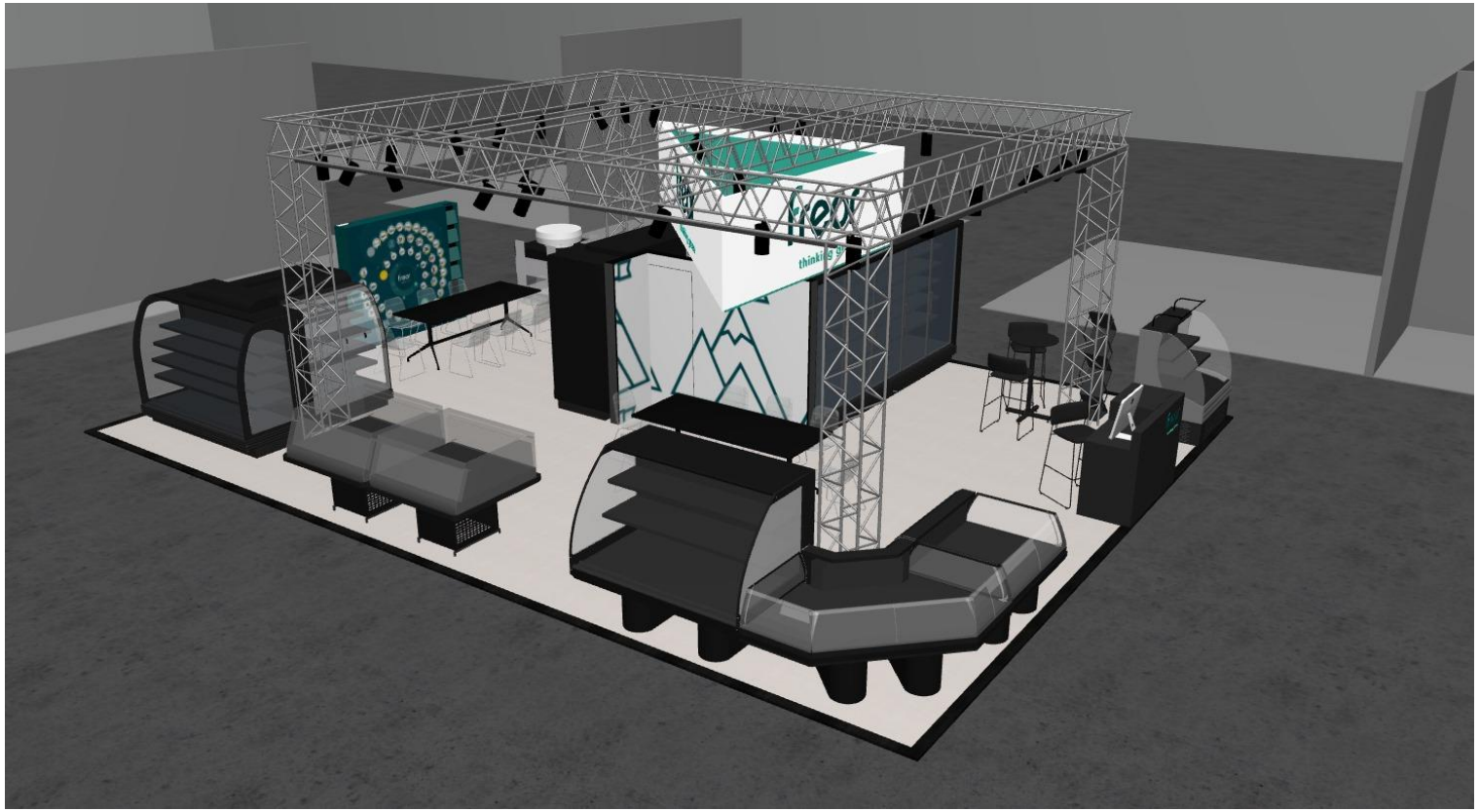
Dry Cooler and Pump Station





- German: Guentner made
- Cooling capacity 20-200kW
- Ambient temperature -20…+43C
- Double water pumps mounted for safety
- Plug and play, easy system
- Automatic glycol temperature control system preset at the factory
- More than 8000 referances

Supermarket Trade Show 2019 at Makuhari Messe



SMTS 2019
SUPERMARKET TRADE SHOW
スーパーマーケット・トレードショー

February 13-15th
Makuhari Messe
Hall 8 304

- Visit our booth
- Cabinets and water loop system in operation!

Thank you !