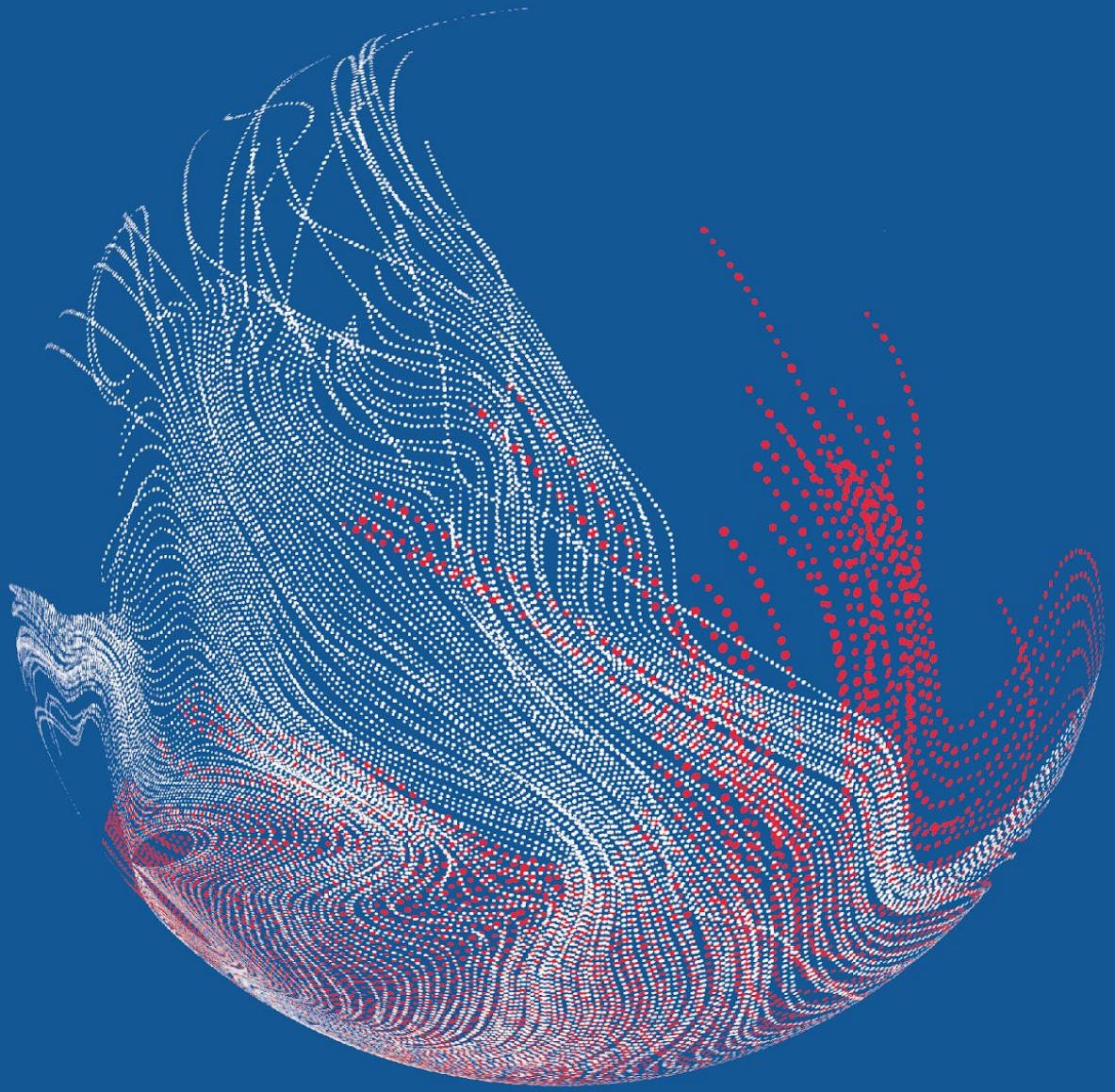
AMERICA ATMO Summit

Business Case for Natural Refrigerants



June 12-13, 2023
Washington D.C.

ATMO AMERICA Summit

The advantages of R290 Monoblocks for Cold Rooms

Embraco | Hussmann

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The advantages of R290 Monoblocks for Cold Rooms

We are Nidec Global Appliance, a global partner for home and commercial appliances industries

HQs: Joinville (Brazil) and Pordenone (Italy).

12,000+ employees.

80+ countries served by our products.

12 manufacturing plants and 4 business offices across 9 countries.

7 R&D Centers worldwide and **500+ engineers**.

Annual production capacity of **80 million** motors and compressors.

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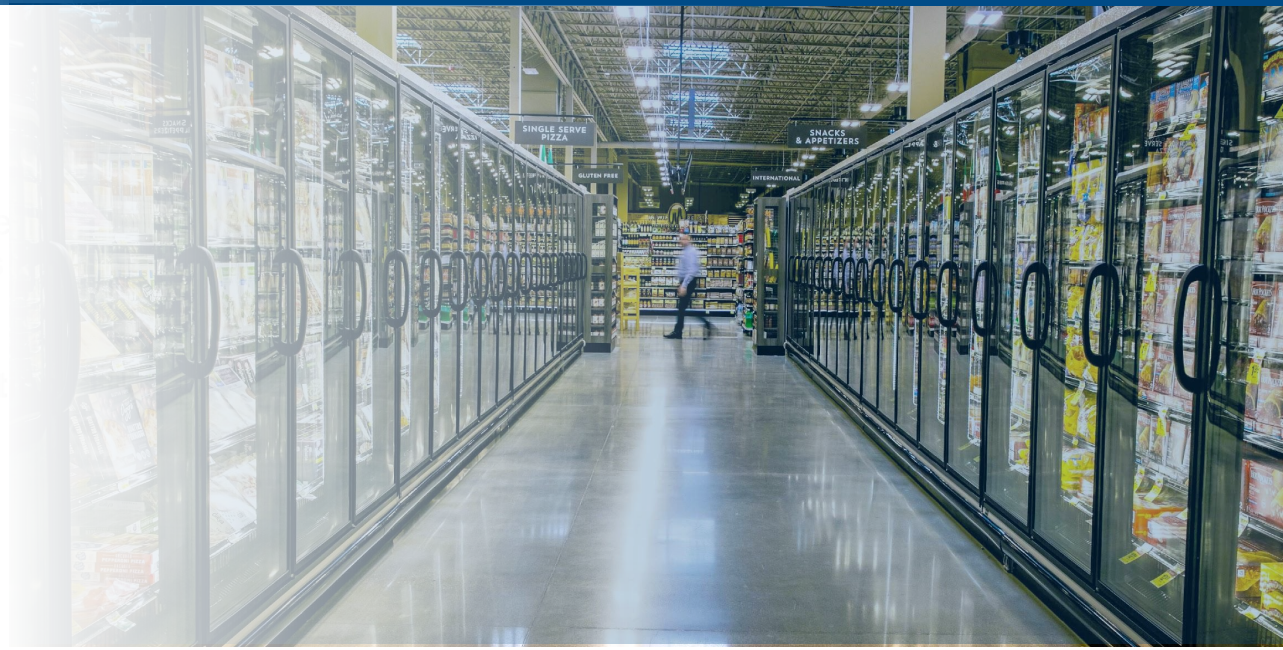
The advantages of R290 Monoblocks for Cold Rooms

HUSSMANN® **Promises to** continuously provide the most customer-focused solutions in the Food Retailing Industry



HQ: Bridgeton, MO, USA; Part of Panasonic

11 manufacturing facilities North America and APAC

7 R&D Centers worldwide

~6,000 employees.

Over 1,200 certified servic and installation technician

100 YEARS **Over a century of innova and quality**

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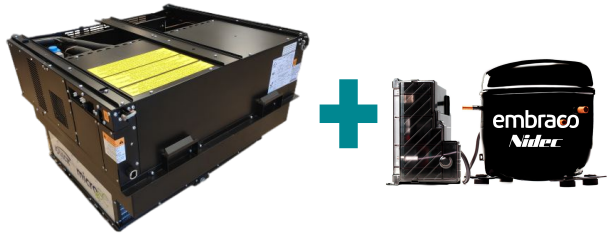
The advantages of R290 Monoblocks for Cold Rooms

Scenario	New Legislation for Commercial Systems: requires sustainable solutions with high energy efficiency
Market Needs	Alternative to the remote systems for cold rooms with low energy consumption, regulation compliant (AWEF) and sustainable
Proposed Solution	**Traditional HFC split System (CDU + Evap)**  **R290 Variable Speed Monoblock** **Sustainable Solutions**

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The Product

FEATURES and BENEFITS:

- Capacities range from 4 to 11.8 MBH for low temp water-cooled and 8.9 to 22.0 MBH for air or water-cooled medium temp
- Reduces full store refrigerant charge by up to 95 percent versus using HFC refrigerants (when all propane is used)
- Box temperatures ranging from -15 to 5°F for low temp and 28 to 50°F for medium temp
- Small design with a 25" height, 35" width, and 37.4" length
- Operating weights range from 242 pounds (water-cooled) to 267 pounds (air-cooled)
- CARB, NSF, UL Listed, and AIM Act compliant

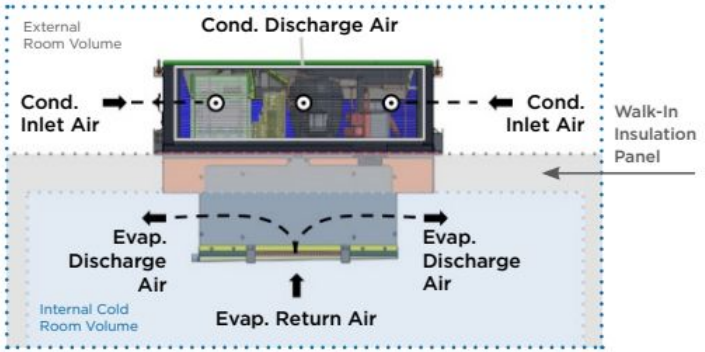
KRACK MONOBLOCK SYSTEMS

MODEL	MODEL NUMBER	VOLTAGE	APPLICATION BOX TEMP	CONDENSER	REAL TIME CLOCK
microDS	KM2VW15UGDR	230V/50/60/1PH	MT 28°F to 50°F	Water-Cooled	Yes
microDS	KM2VW15UGDN	230V/50/60/1PH	MT 28°F to 50°F	Water-Cooled	No
microDS	KL2VW15UGDR	230V/50/60/1PH	LT -15°F to 5°F	Water-Cooled	Yes
microSC	KM2VA15UGDR	230V/50/60/1PH	MT 28°F to 50°F	Air-Cooled	Yes

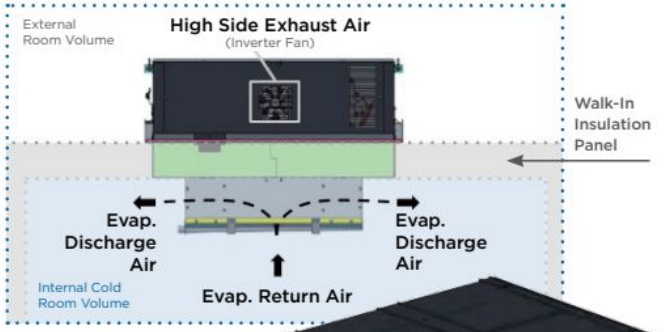
New units coming soon

AIRFLOW DESIGN:

Air-Cooled Side View



Water-Cooled Side View



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Systems Characteristics

Applications

Dairy Products (35 ºF)
Freezer (-13 ºF)

Thermal Load

70,000 BTU/h (Dairy)
20,000 BTU/h (Freezer)

Proposed Solution

Conversion from two HFC split systems to
7 Medium Temp. + 3 Low Temp. Water Cooled Monoblocks
with less than 150g refrigerant charge per circuit

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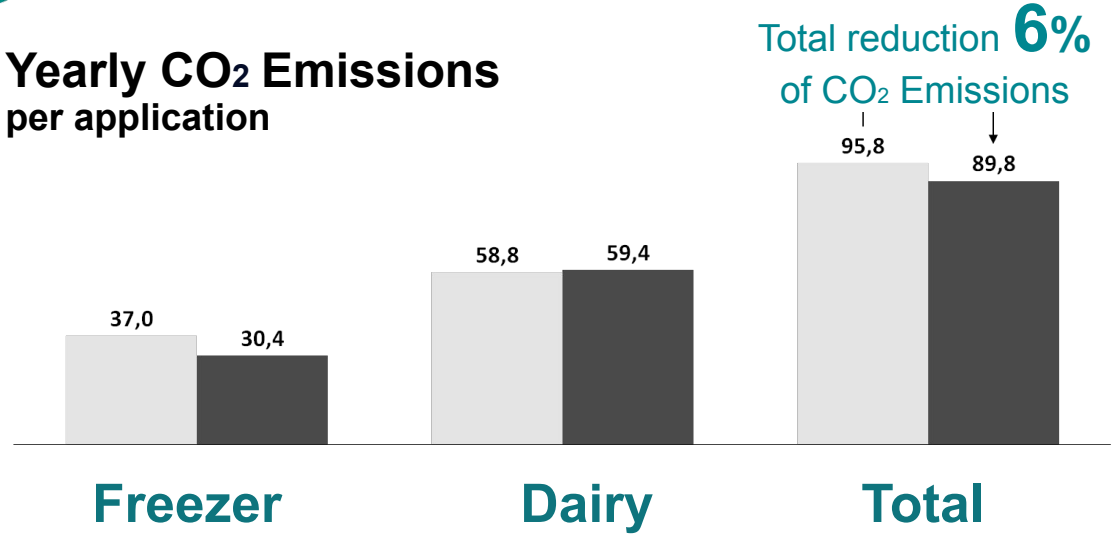
Case Study Results

Over 90,000 kg of CO_2 emissions reduction over the **lifetime**[1] for less than $12/month[2]

Future Proof - R290 charged units

Yearly CO_2 Emissions
per application



[1]Product Lifecycle estimated at 15 years

[2]Energy cost increase $12/month due to the higher energy consumption in MT systems

Additional results

Factory Charged & Inspected
No Refrigerant Leakage on field!

UL 60335-89 Annex CC testing not required
R290 charge lower than 150g per circuit

DOE / AWEF Compliant
Already approved for upcoming Variable Speed AWEF

Ease of Installation
and to handle maintenance

Yearly Energy Consumption [kWh]			
Solution	Low Temp	Medium Temp	Total Consumption
Traditional HFC Solution	2,294 kWh	3,457 kWh	5,751 kWh
R290 Monoblock	2,271 kWh	4,441 kWh	6,712 kWh

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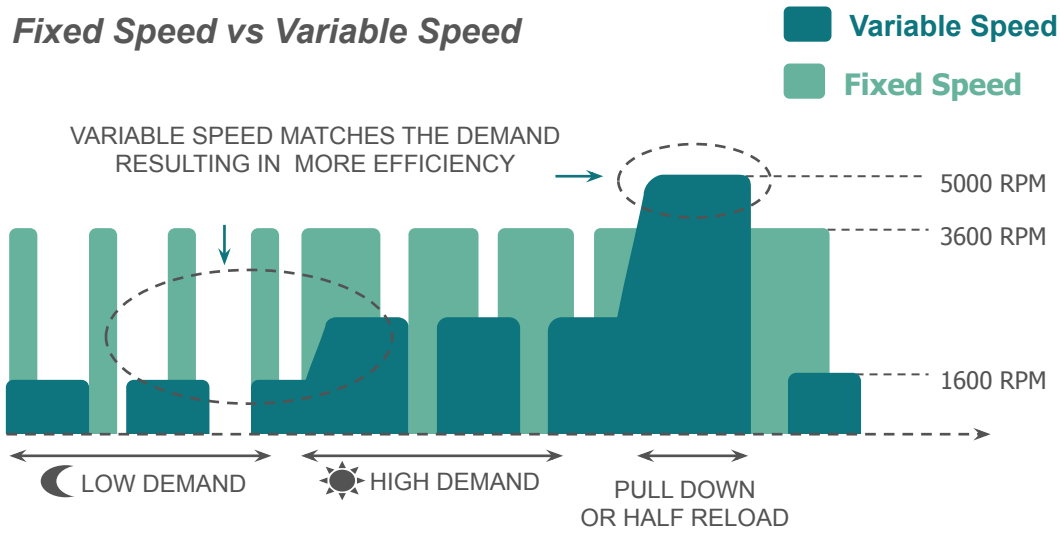
The Benefits of Variable Speed and Natural Refrigerants in Food Retail Applications

The variable speed technology **adjusts to the demand required by the refrigerator**, resulting in considerable energy consumption reduction compared to single speed compressors

Fixed Speed vs Variable Speed



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Benefits

- Energy Efficiency
- Low noise & vibration
- Wide Voltage range
- Food Freshness
- Temperature Stability

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The advantages of R290 Monoblocks for Cold Rooms

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Future Proof Solutions to lower total cost of ownership in food retail applications

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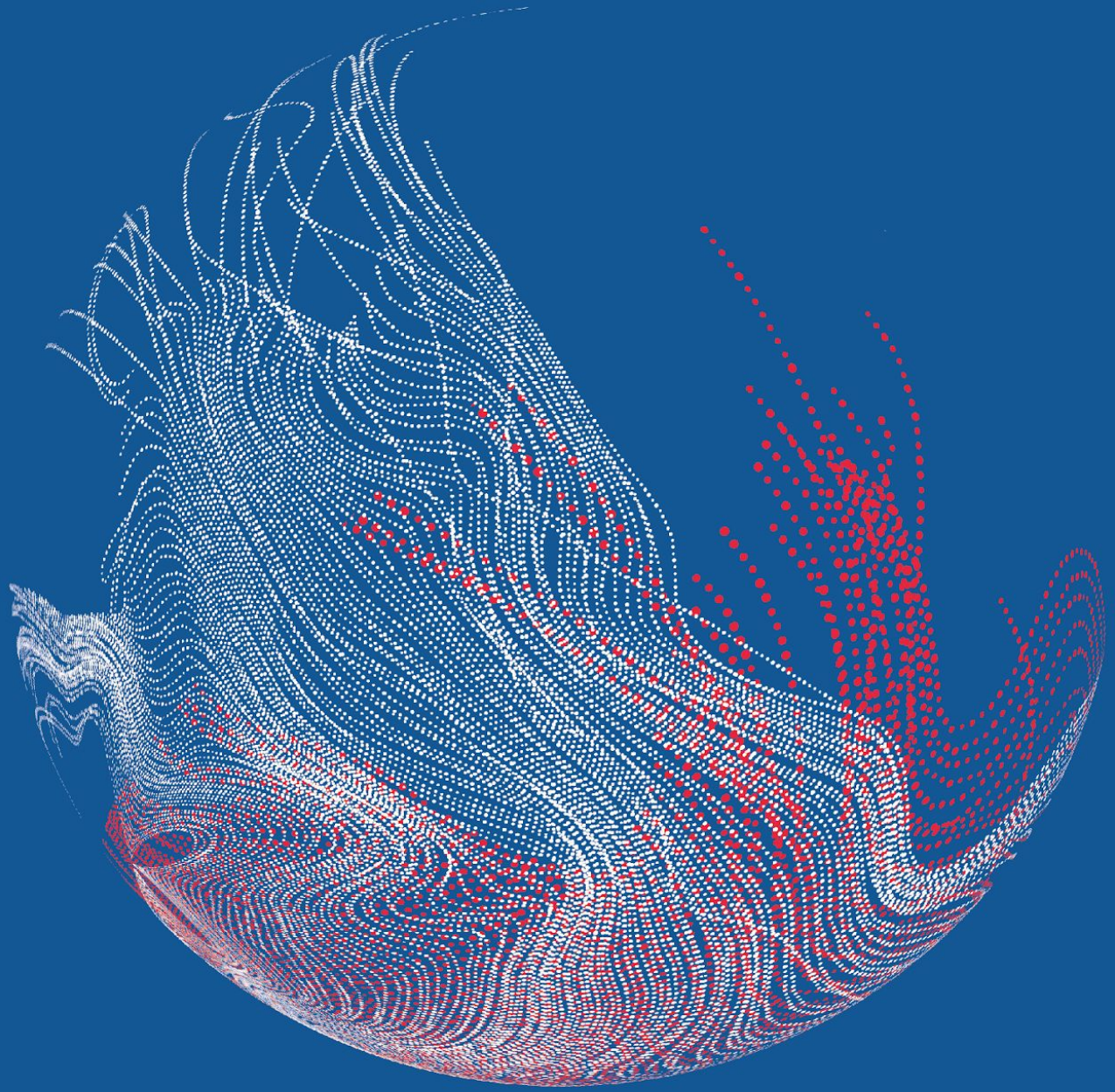

Thank you for listening!