

A new concept for **supermarkets** and **convenience stores** by **embraco**
Nidec

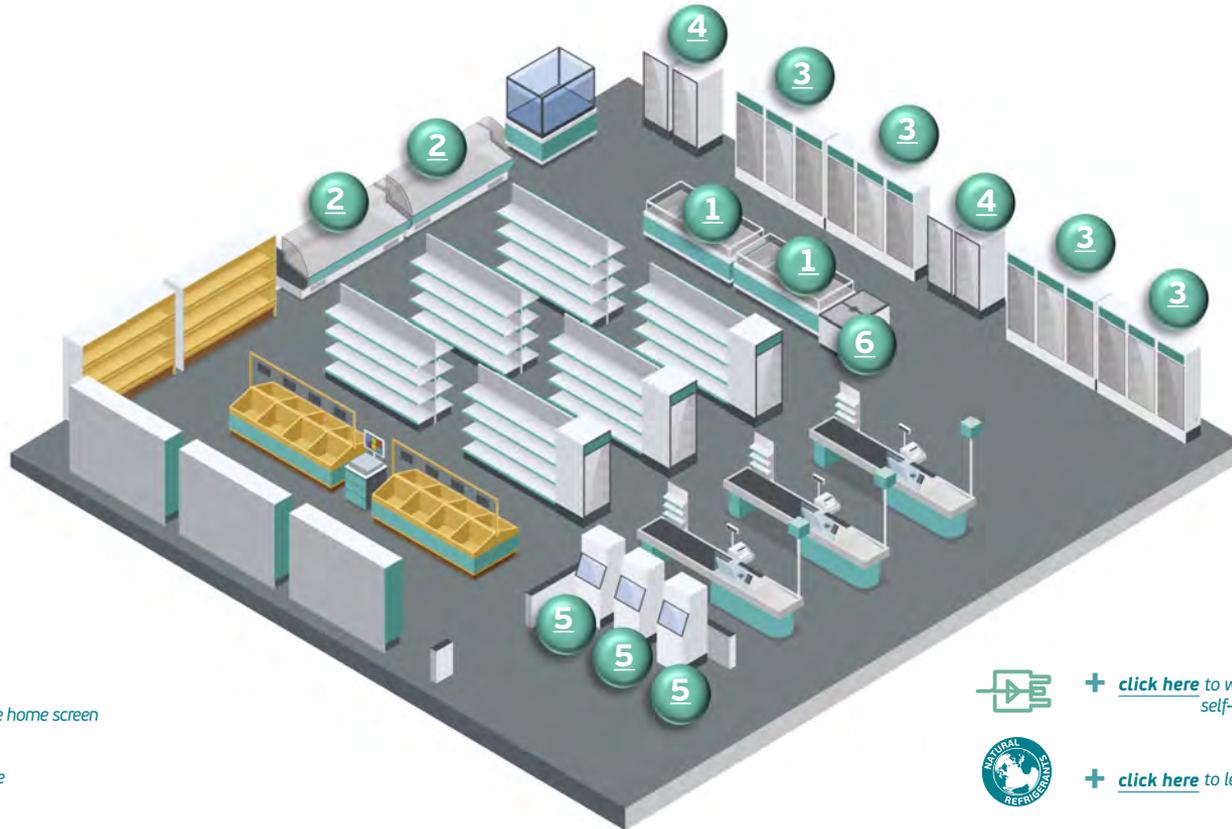


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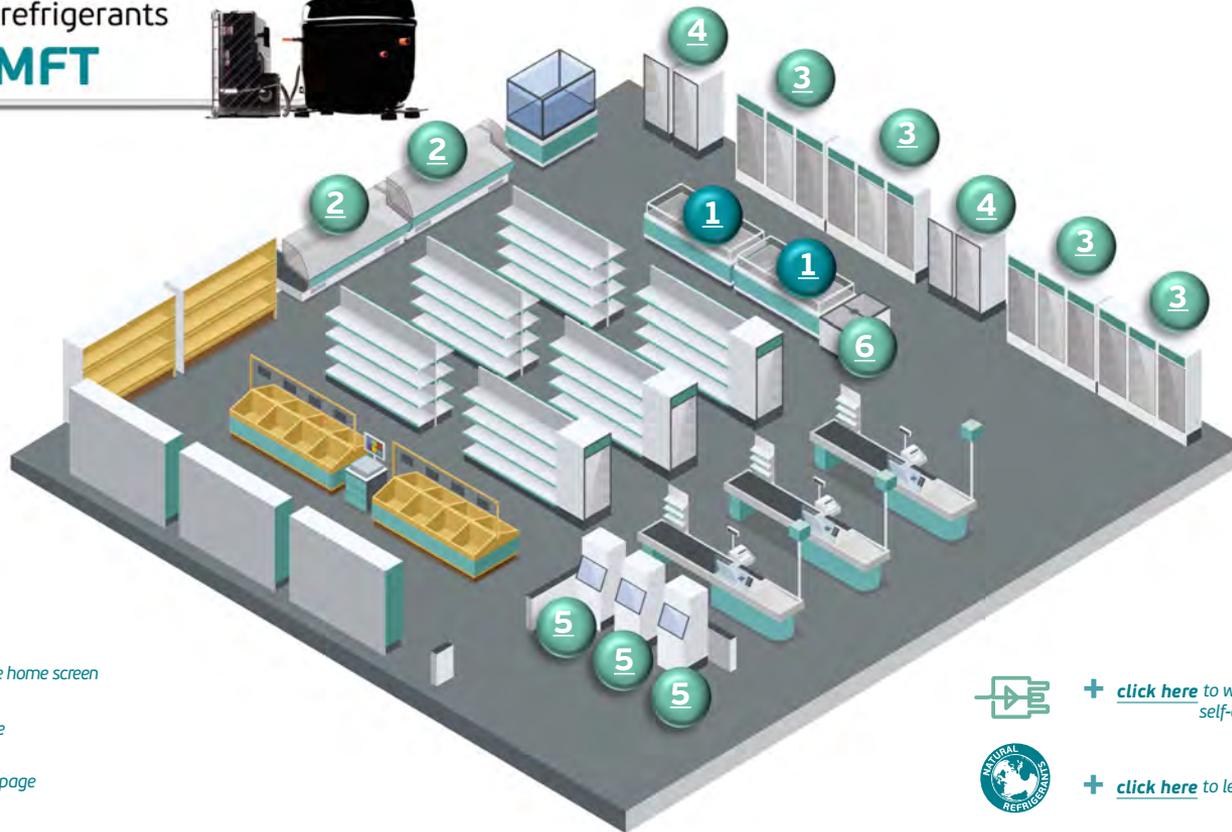
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Energy savings and efficiency
for your frozen island operating with
natural refrigerants

FMFT



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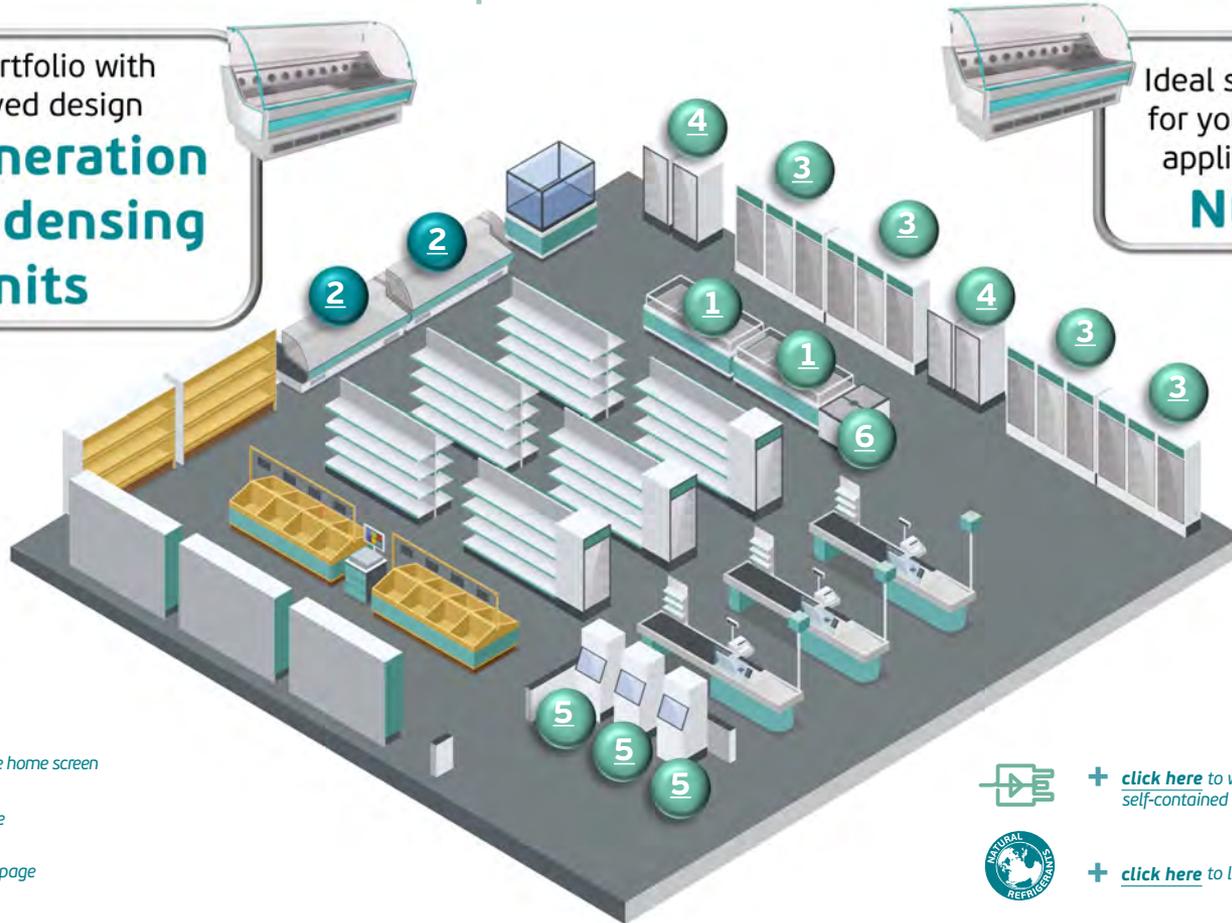


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New portfolio with improved design
2nd generation of condensing units



Ideal solution for your MBP application
NEX



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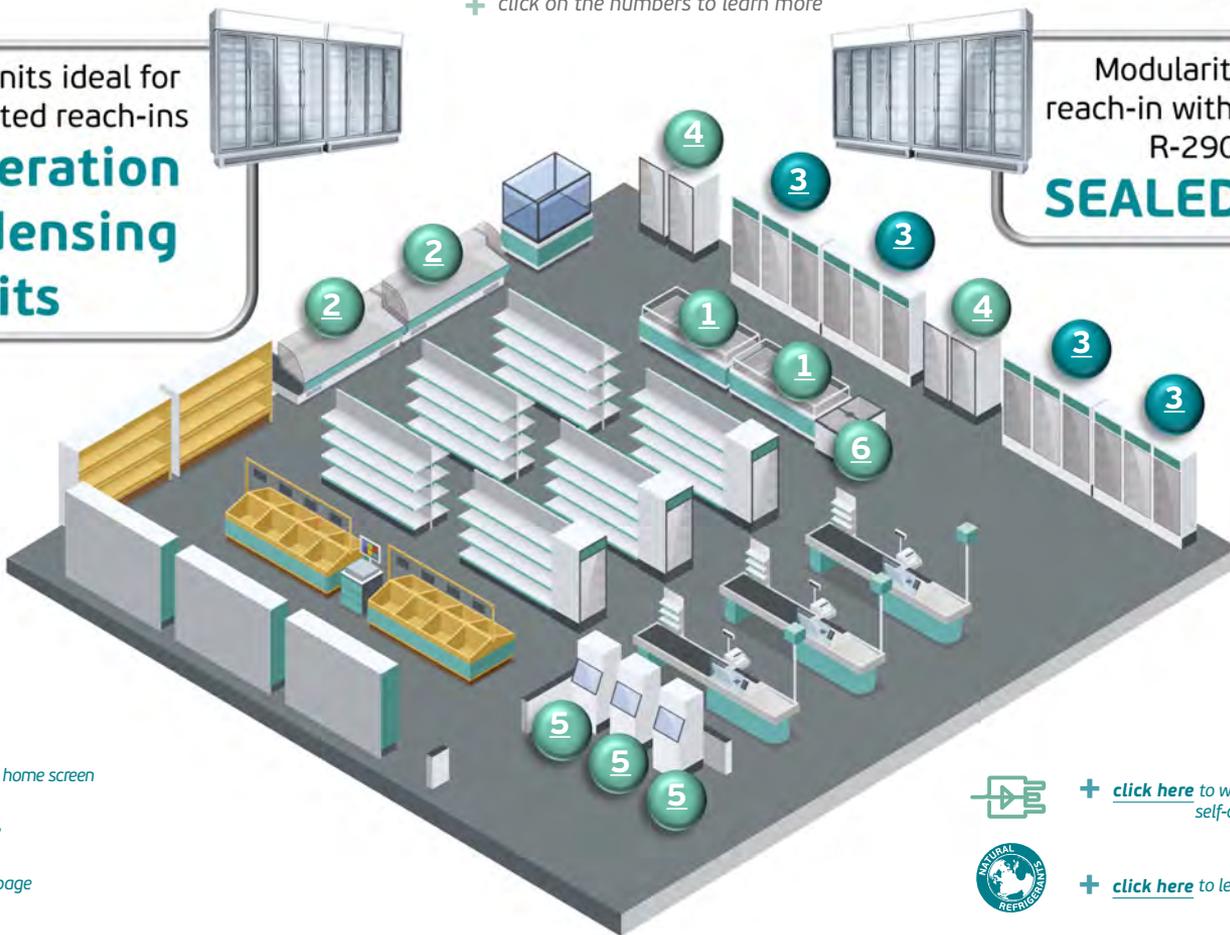
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Low profile units ideal for bottom mounted reach-ins
2nd generation of condensing units



Modularity for your reach-in with pre-charged R-290 deck
SEALED UNITS



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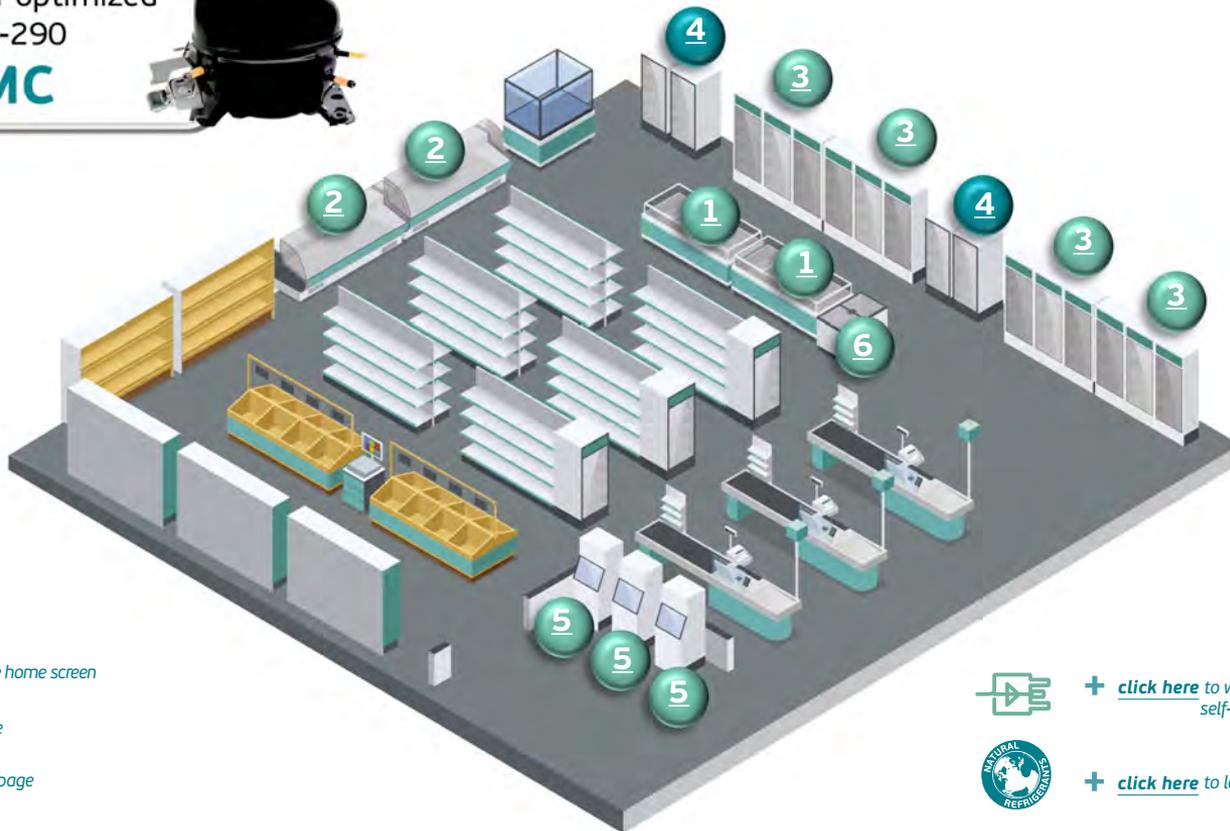
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Compact and top efficient
compressor optimized
for R-290

EMC



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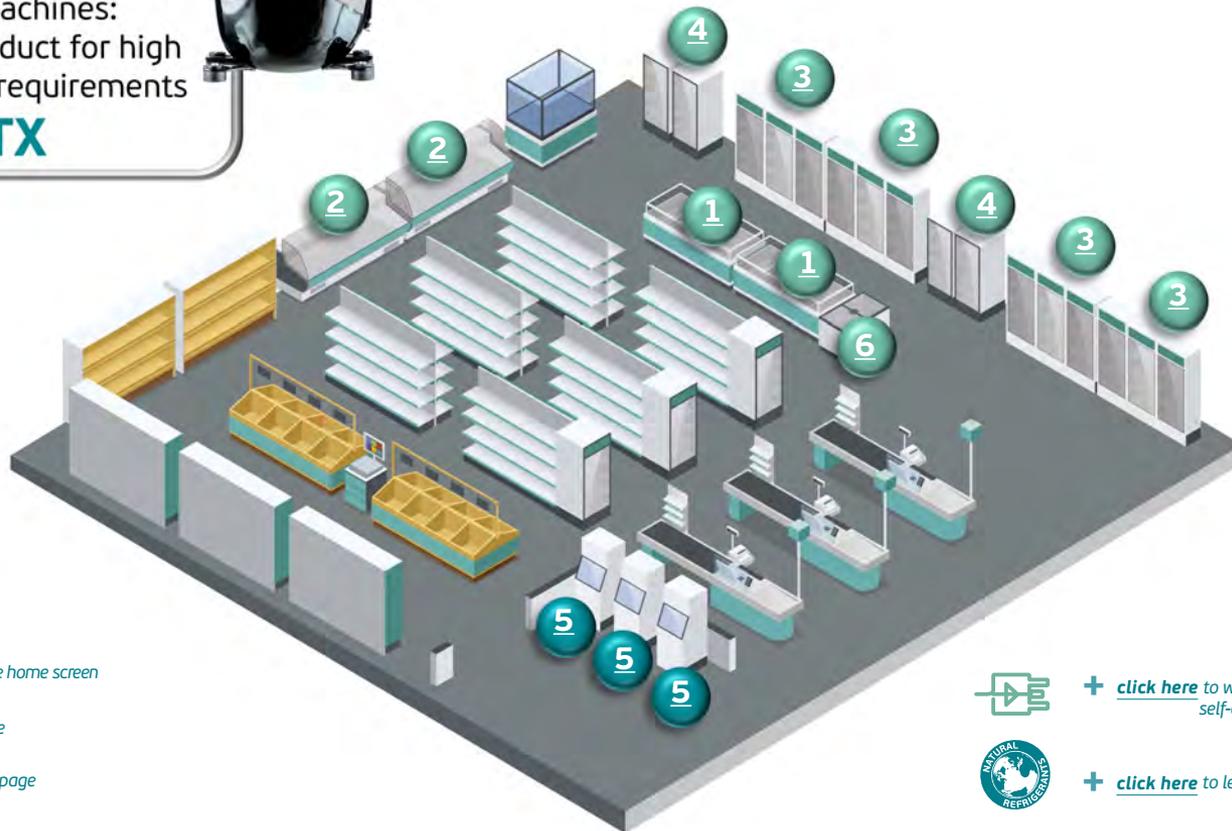


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Leading R-290 technology for ice machines:
a reliable product for high performance requirements



NTX



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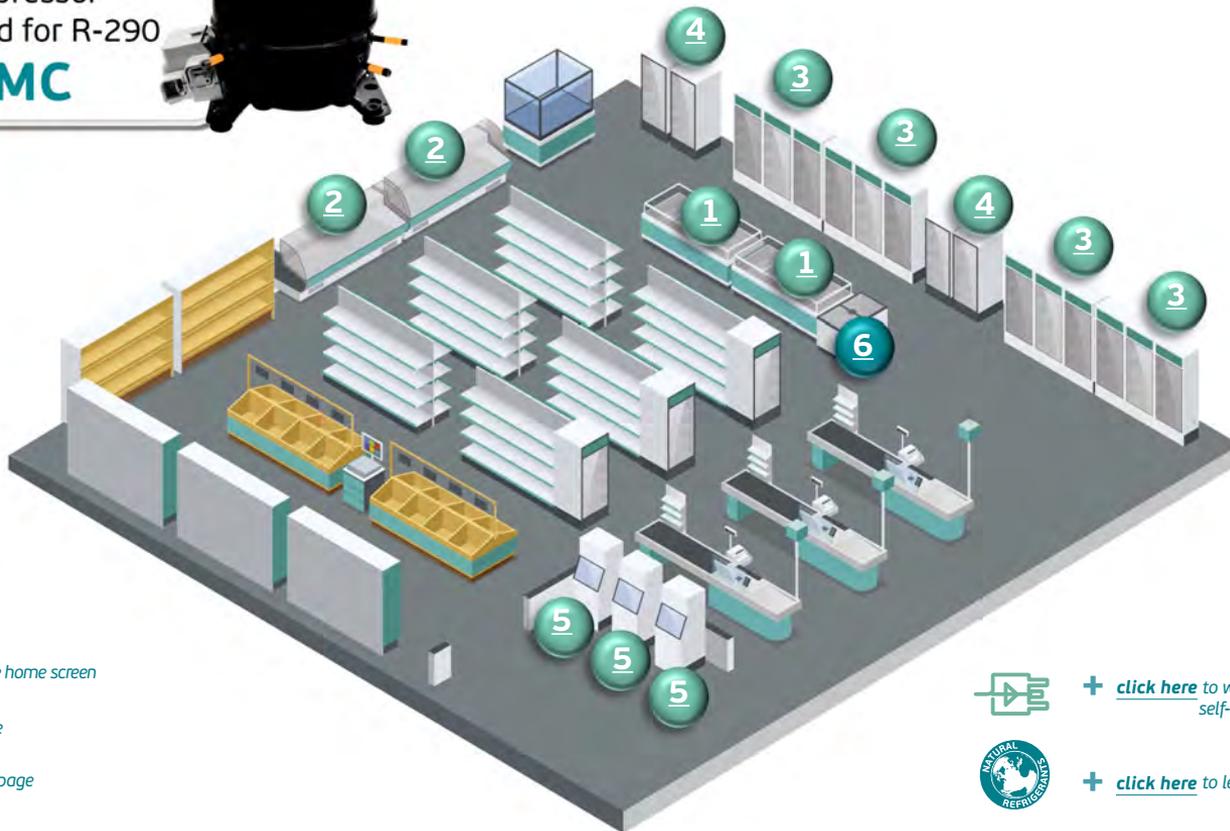
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VIDEO

«Self-contained vs remote system»



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R-290 COMPRESSORS

Let me introduce you to R-290

- ▶ **R-290 = propane**
- ▶ Extremely **low GWP** hydrocarbon
- ▶ **High efficient** natural refrigerant



A3 Safety class
(high flammability /low toxicity)

Flammability main features

• Lower explosion limit	0.038 [kg/m ³]
	2.10 [%]
• Upper explosion limit	0.177 [kg/m ³]
	9.5 [%]
• Minimum ignition temperature	460 °C

Did you know?

1. With the 5.3oz (150g) charge limit Natural Refrigerants (**R-290** and **R-600a**) already can cover most household and light commercial applications.



In many case the **refrigerant charge is equivalent to 2 or 3 cigarette lighters.**

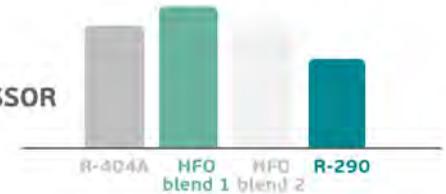
That means a **reduction of refrigerant charge UP TO 50%**



2. Reliability

- Lower operating temperatures compared to R-404A
- Lower shell temperature
- Lower discharge

LONG COMPRESSOR LIFE



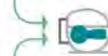
3. Compressor changes

FOR A SAME COOLING CAPACITY, THE R-290 PRESSURES ARE **LOWER THAN R-404A AND HIGHER THAN R-134a**

SPECIFIC MOTORS DEVELOPMENT IS REQUIRED FOR R-290 MODELS.



R-404A



R-290



R-134a

DISPLACEMENT NEEDED IN A R-290 COMPRESSOR USUALLY IS BIGGER THAN R-404A AND SMALLER THAN R-134a

- Polyester is the recommended **LUBRICANT** for its biodegradability and good viscosity at high temperature.
- Electrical components must be compliant with EN 60079-15 requirements.

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Safety and Practical



Remember to:

Always conduct a risk assessment.

Always wear safety glasses and gloves.

The work area must be monitored with a hydrocarbon detector.

Good ventilation is essential.

The work area must be free from sources of ignition.

Assure the presence of a fire extinguisher.

Use only tools and equipment certified for use in hazardous areas and wear an antistatic-electricity tag.

Into internal of cabinet all electrical devices must be encapsulated or fire and explosion proof. In the exterior of cabinet, considering small charge the risk is remote, but «built-in» systems inside another structure are more susceptible to this possibility.



Compressor Replacement



▶ Have the **compressor manufacturer's spec sheet on hand** and verify the correct compressor is in the system and be sure to use the new starting components that came with the compressor.

▶ Post **safety placard** with no smoking/flammable gas work site.

- Ensure HC specific **reclaim machine** and **recovery cylinder** are used.
- Always use refrigerant that is **labeled "R-290"** and never just "Propane".

Key Messages



Common sense and staying alert will go a long way towards working safely with flammable refrigerants.

Develop work procedures that **keep in mind the flammable nature of natural refrigerants** and follow them on every job.

Hydrocarbon refrigerants do not have an odorant, so leaks can't be identified by smell. **A quality combustible gas leak detector is mandatory** for HC service work.

It is a good idea to pass the **combustible gas detector** through every work site a technician goes into.



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