ENGINEERING TOMORROW

Commercial refrigeration applications

Move on from R404A to R448A

In stationary systems with remote condensing units and self-contained units. We are ready when you are.

New installations

Redesign and retrofit

If the condensing unit is not qualified for alternative refrigerants.

Drop-in

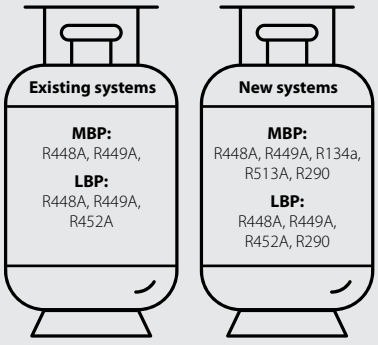
If the condensing unit is already qualified for alternative refrigerants. No major changes in the system.

1. Use **Coolselector®2** to select a new condensing unit, compressor, and other system components.
2. Use the **Coolselector®2** commercial applications module to calculate cold room loads and find all Danfoss solutions for a specific refrigerant.
3. Pay close attention to Ecodesign level of the condensing unit.

1. Ensure that the compressor or condensing unit operating map with new refrigerant fits with your application.
2. Adjust settings for expansion valves, safety switches, and the controller, if any.
3. Clean the system and change the filter drier and sight glass for a longer lifetime.

Possible replacements for R404A

Main refrigerants in play – non-exhaustive list.



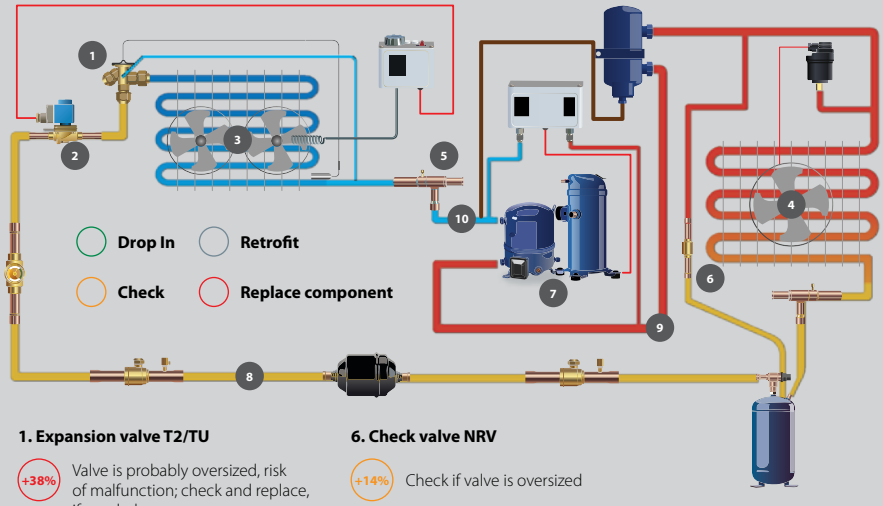
You can view a detailed log(p)-h diagram for your chosen refrigerant in **Coolselector®2**

For potential charge limitation of A2L refrigerants, please refer to your local regulations.

Typical operating temperatures and times in cold rooms

- **Meat** +1°C; 18h
- **Fish** +1°C; 18h
- **Fruit & Vegetables** +8°C; 18h
- **Fruit & Vegetables** 0°C; 18h
- **Butter, Eggs, Cheese** +5°C; 18h
- **Laboratories** [+1°C; +15°C]; 18h
- **Freezers** [-18°C; -23°C]; 16h

Impact on system performance with R448A



1. Expansion valve T2/TU

- +38% Valve is probably oversized, risk of malfunction; check and replace, if needed
- -5K Risk of malfunction. Requires big change in settings. Superheat adjustment is critical.

2. Solenoid valve EVRv2

- +33% Check if the valve is oversized

3. Evaporator (Te = -30°C)

- +16% Check dimensioning

4. Condenser MCHE (Tc = 40°C)

- -16% Check dimensioning

5. Pressure regulator KVP

- +9% Valve should be ok

6. Check valve NRV

- +14% Check if valve is oversized

7. Compressor MTZ/NTZ/MLZ/LLZ and Optyma™ condensing units

- 13K Discharge temperature change
- -6% Heating capacity
- -8% Cooling capacity should be ok
- +2% Power
- -10% COP

8. Liquid line

- +36% Piping oversized
  No risk, just low velocity

9. Discharge line

- +5% Pipe should be ok
- +69°C Discharge temperature

10. Suction line

- +2% Pipe should be ok

Other components

DML, DCL filter driers, **SGP** sight glass, **GBC** ball valves, **KP** pressure switches, **XGE** fan speed controller are qualified for this refrigerant. No resize is needed.

Source: Danfoss, example for a medium temperature application operating at -10°C with 35°C condensation temperatures

Access our online resources 24/7

- Coolselector®2
- Refrigerant Slider
- Retrofit guidelines
- Refrigerants.danfoss.com

Tested and approved

All new and upgraded Danfoss products undergo extensive testing to qualify for new refrigerants.