

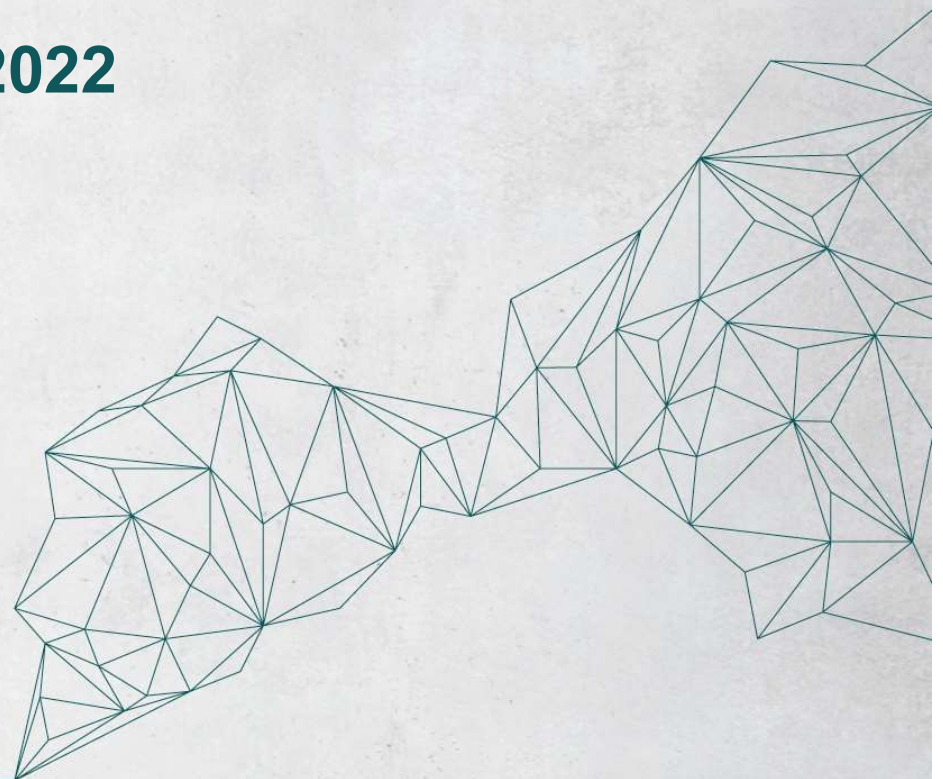
Hall 7A

**CHILLVENTA**

# **Chillventa Specialist Forums 2022**

## **Chillventa Fachforen 2022**

**CONNECTING  
EXPERTS.**



ENGINEERING  
TOMORROW

*Danfoss*

# Optyma™ iCO<sub>2</sub> condensing units for cold rooms and display cases

Natural  
refrigerant  
**R-744**





# Commercial refrigeration will face the perfect storm in 2025

Are you prepared ?



Ecodesign

F-GAS

PFAS

Climate  
actions

# R-744 is getting traction : why ?

## Sustainability as a megatrend

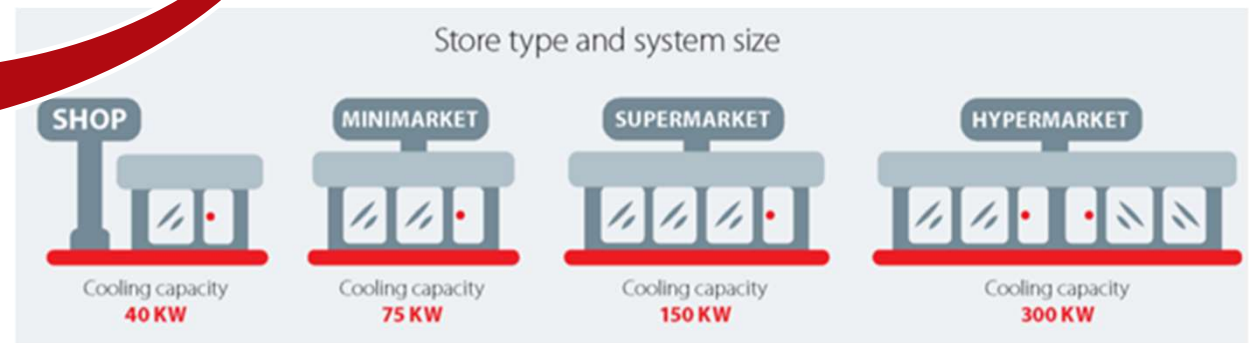
### R-744 (CO<sub>2</sub>)

- ✓ Natural refrigerant
- ✓ Zero ODP
- ✓ Non-Toxic
- ✓ Non-Flammable
- ✓ Ultra-low GWP of 1 regardless of the time period used
- ✓ Removes direct climate impact from leakages and reduces the cost of refrigerants

Refrigerant	GWP 100 years	GWP 20 years
CO <sub>2</sub>	1	1
R404A	3922	6600
R407F	1825	4130
R448A/R449A	1390	3100
R454C/R455A	148	545

# The Danfoss journey on CO<sub>2</sub> from supermarkets to small stores

After the development of a full CO<sub>2</sub> portfolio the time has come to put together technology bricks to offer condensing units delivering customer needs for smaller shops !





# Optyma™ iCO<sub>2</sub> condensing units

## Key benefits

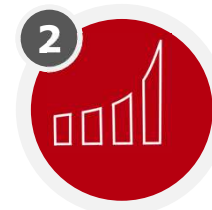


Available from stock

Stock Dec 2022



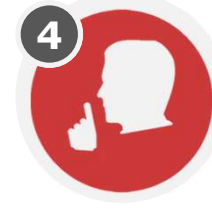
**Plug & play and ready for monitoring and management** pre-programmed controller and components, only need to adjust evaporating temperature setpoint on easy-to-use interface, or connect to evaporator controller



**High energy efficiency** thanks to two-stage\* inverter driven hermetic compressor with high turn down ratio, the seasonal efficiency is best in class



**Robust and reliable operation over time** even during heatwaves up to 43°C\* / 46°C ambient # thanks to high quality components and intelligent flash gas injection



**Quiet operation** thanks to smooth scroll compression, compartment insulation and DC fans, noise does not exceed 35dB(A)# at 10 meter – almost two times quieter than HFO systems









\* 20kW model

# 5 kW model

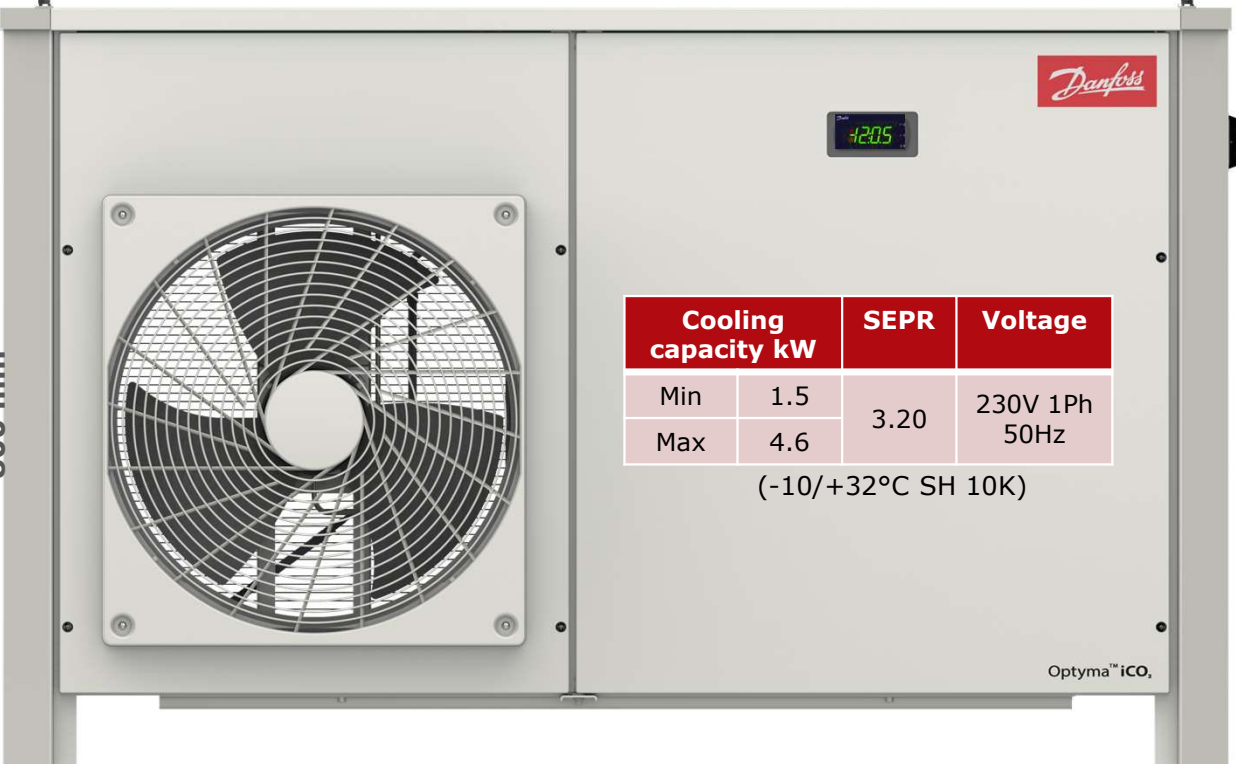
# Optyma™ iCO<sub>2</sub> condensing unit

## Technical features

Available from stock

-  Variable speed scroll compressor:  
30% to 100%,  
incl. oil separator
-  Connectable to  
Danfoss  
System Manager
-  GBC service valves
-  Sight glass
-  Filter drier
-  DC fan
-  Gas By  
Pass Valve
-  Microchannel gas  
cooler

**1290 mm**












**800 mm**


Cooling capacity kW		SEPR	Voltage
Min	1.5	3.20	230V 1Ph 50Hz
Max	4.6		


(-10/+32°C SH 10K)

Optyma™ iCO<sub>2</sub>

-  Integrated  
controller and drive
-  2 X 2.5 L Receiver
-  2.5 L Suction  
accumulator
-  PED category I
-  Night mode  
operation
-  Fan speed variation
-  Stacking up  
to 2 units
-  External Main  
switch

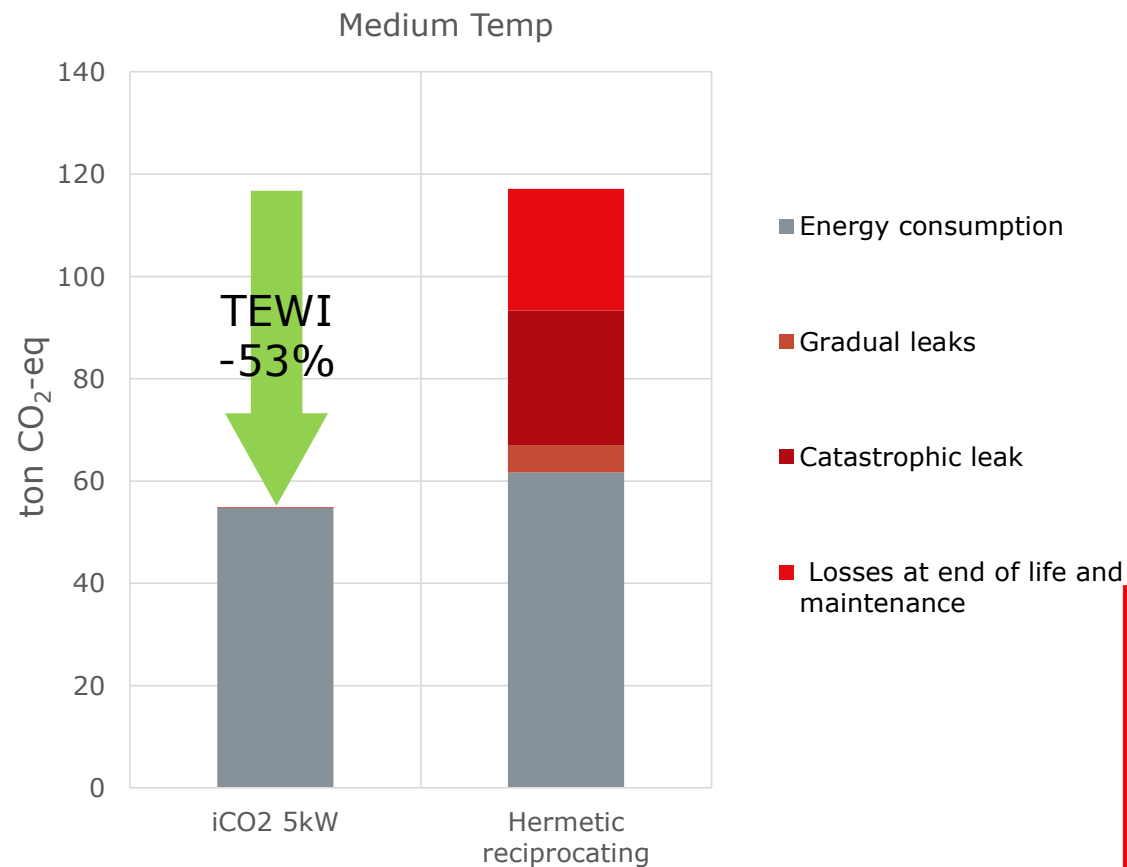
 MMILDS display

 Pressure relief  
valve (80 Bar)

 2 doors for  
servicing

# Reducing energy consumption and CO<sub>2</sub> emissions using R-744

## Versus conventional R404A condensing unit



Field trial campaign – South of France



Energy  
Consumption  
-11%



# Optyma iCO<sub>2</sub> 20kW MBP - 10kW LBP

Stock Dec 2022

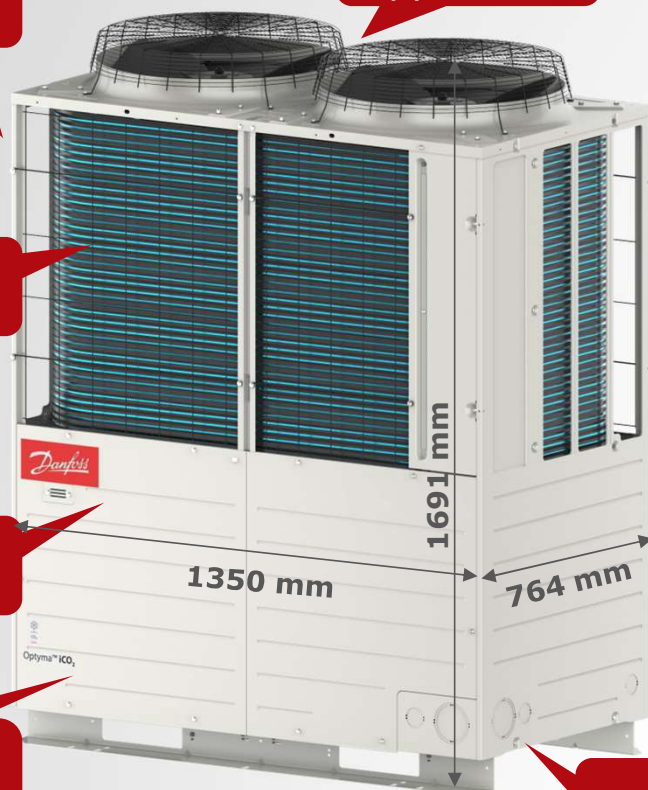
**45 dB(A)**  
10 meter MBP

MBP or LBP  
application

2 X 7.6L  
Receiver

Low  
footprint

Maximum  
pipe length  
100m



2 stage trans-critical  
hermetic compressor

Oil separator and  
flow back  
management

Maximum ambient  
temp 43°C

PED Cat II

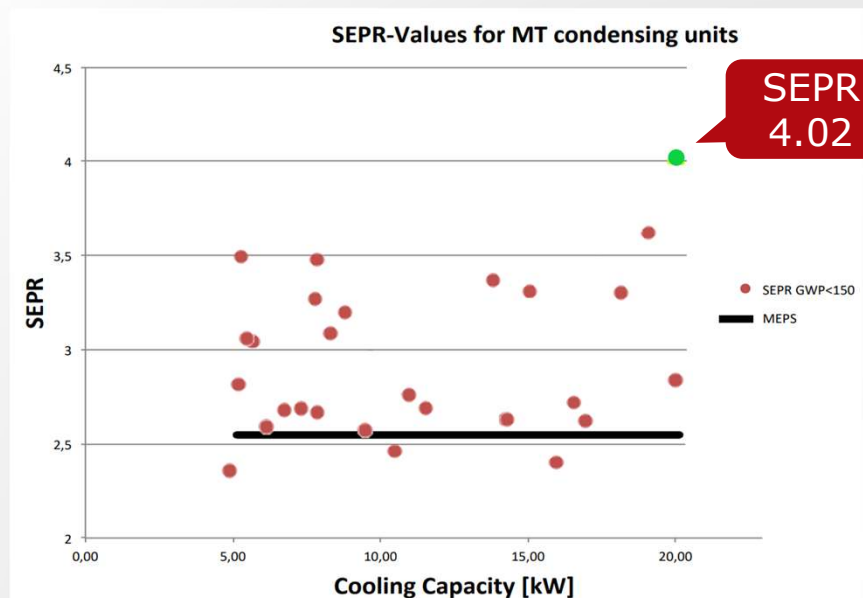
Variable speed from  
36 to 100%

Pressure relief valve  
80 Bar

340 kg

Cooling capacity kW		SEPR	Voltage
Min	7.1	4.02	400V 3Ph 50Hz
Max	19.6		

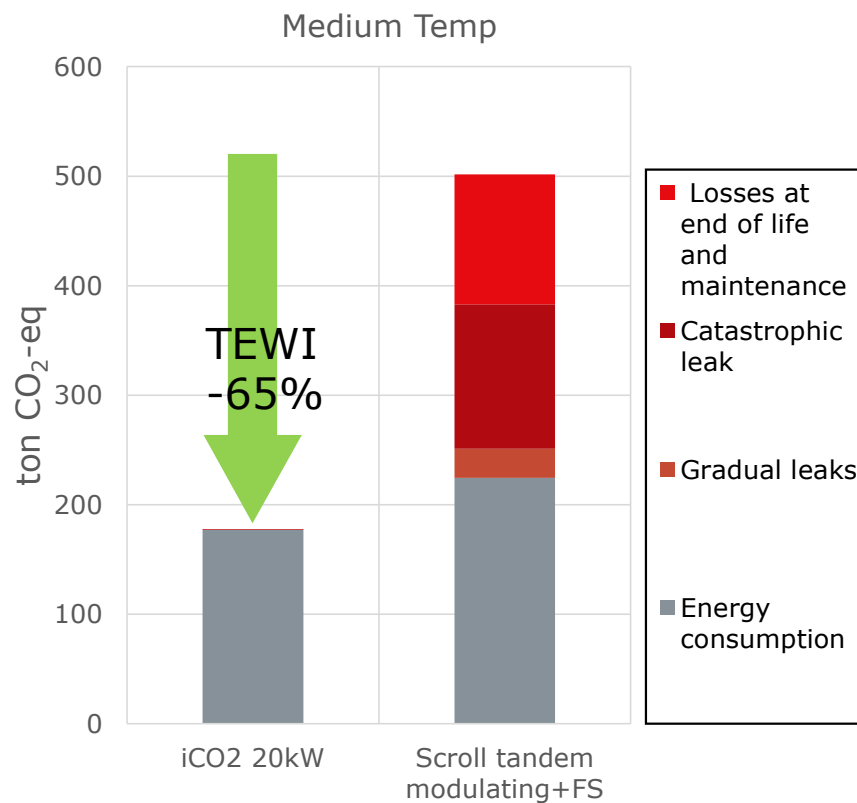
(-10/+32°C SH 10K)



Source : Wuppertal Institute 2021

# Reducing energy consumption and CO<sub>2</sub> emissions using R-744

## Versus conventional R404A condensing unit



**Energy**  
Consumption MT  
**-22%**



Nature is at work with  
the **Optyma™ iCO<sub>2</sub>**

More to come !  
Thank you





Hall 7A

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