

CONVERSION OF A UNIT FROM R-404A TO RS-50 (R-442A) +30% Cooling Capacity

8 À HUIT (LAMBRES LEZ DOUAI, FRANCIA)

The company and its objectives

This store « 8 à Huit », in LAMBRES LEZ DOUAI (59) wanted to add a cabinet to a R404A unit. However, it was already at the top of its nominal capacity.

Christophe Despierre, co-manager of DT FROID de LOMME, and in charge of the maintenance of this property, wanted to propose an economical, efficient solution, whilst anticipating legislation, in order to achieve sustainability in the client's installations.

The choice of the refrigerant RS-50 (R442A) as a replacement for R-404A has allowed him to respond to the issues raised:

- ✓ Global Warming Potential (GWP) below 2500 to ensure the sustainability of the refrigerant.
- ✓ Compatibility with the existing facilities.
- ✓ Good return of the existing lubricants.
- ✓ Additional cooling capacity of 30% without increasing power consumption.
- ✓ Keep the current electric meter.

Description of the installation:

REFRIGERATION UNIT ON R-404A

2 x Bitzer4 FC 3.2 Y-40S

2 x 8 630 W = 17260 W a -10°C / + 45°C

Wall cabinet PROXIMA

UD5 6.35 ML (1 x EU6 + 1 x EU 4)

Wall cabinet PROXIMA

UD5 5.10 ML (2 x EU 4)

Requested capacity in the positive circuit:

1 cabinet set 5.10 mL: 8100 W

1 cabinet set 6.35 mL: 10250 W

Total theoretical capacity = 18350 W

Considering a correction factor of 10% would result 16605 W.

$17260\text{ W} - 16605\text{ W} = 655\text{ W}$ available when the property desires to install a new cabinet of 3.75 m of 5080 W capacity.



- ✓ Enlargement of the cabinet
- ✓ Increase of capacity by approximately 30%
- ✓ Continuity of the system beyond 2020
- ✓ Footprint reduction – direct and indirect

Proposed Solution:

Christophe Despierre:

"We proposed to "boost" the central system by replacing the refrigerant R404A with RS-50 in addition to changing 2 of the condenser fans. The new refrigerant allows for a higher cooling capacity of approximately 30%; and with a GWP of 1888, it allows to keep the facility beyond 2020, unlike R404A. New fans, with increased speed, will enable us to gain capacity at a condenser level without changing it. It will require an additional network pipe from the new cabinet to the unit".

Conversion to RS-50 was completed in November 2014:

- ✓ Reclaim of R404A charge.
- ✓ Drain and change POE lubricant.
- ✓ Replace dehydrators cartridges and oil filters.
- ✓ RS-50 charge equivalent to R404A.
- ✓ Close expansion valves by 40%.
- ✓ Changing set point of floating BP and of the refrigerant's thermodynamic table in the DIGITEL regulators.

Performing the conversion:

- ✓ Refrigerant reclaim.
- ✓ Cooling circuit drainage.
- ✓ RS-50 charge.
- ✓ Replacement of 2 condenser fans.
- ✓ Tightness control.
- ✓ Set-point regulation.
- ✓ Regulators adjustment.

Why choosing RS-50?

Franck Krier, director of FRAMACOLD:

"With the new F-GAS legislation, the choice is clear to me: the most economical solution for the end customer will be the solution adopted by the majority.

Given the fact that electricity is a rising cost, more than 70% of the cost of a cooling installation, throughout its life, corresponds to the electric consumption. Common sense is to improve the COP of the equipment and therefore its energy efficiency.

With an increase in energy efficiency between 20 and 30% compared to R404A, RS-50 is the best performing refrigerant of all current refrigerants. Furthermore, its low GWP of 1888 makes it sustainable, without any deadline for maintenance operations.

In a NEW equipment, it is therefore the most economical option because it allows the use of smaller compressors than with R-134a or with R-404A.

In RETROFIT from R-404A to RS-50, it is also the best solution due to its high performance but also thanks to its special components, greater oil return is achieved.

To conclude, thanks to energy savings obtained with RS-50, the return of investment is very fast.

It is the first time that users will save money by anticipating regulations on refrigerants for the sustainability of their facilities.

The conversion process is simple and the results are impressive, as shown with each installation made with RS-50. This subject specially interests me because everyone can make a significant and immediate action towards the environment.

Conversion result:

Christophe Despierre:

"This is a "drop-in" direct conversion, without changing the type of oil or any of the main components. However, because the mass flow of RS-50 is 40% lower than R404A, we had to close expansion valves and change their apertures. We started the converters and the floating BP and modified the set point from -15 to -10°C. It was not required to change the type of lubricant. There has been no leak due to refrigerant replacement.

Our client is very happy:

- He has the additional linear.
- Intervention time is minimal.
- Keeps the existing unit.
- Anticipates the end of R404A.
- Benefits from significant energy savings every day because the installation generates more cooling without any additional kW on the counter.

And I have a happy and loyal customer, as well as a common sense solution in these difficult times.

I would like to add that there was no leak due to joint incompatibilities because RS-50 components are HFCs just like R404A or R407".



In the forefront, the new cabinet.
In the background, the



BITZER tank groups, with 40 kg of RS-50.