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Eurovent comments on the review of Lot 21

In a nutshell

Following the Consultation Forum meeting on 11 December 2023, with this paper, Eurovent provides preliminary comments on the Lot 21 review in relation to rooftop units, chillers, reversible heat pumps and VRF including:

- **Adoption of new refrigerants in a short time creates uncertainty on the future efficiencies.**
- **A proposal for a new definition for Rooftop Units.**
- **A suggestion to include free cooling in the evaluation of energy efficiency.**
- **Reversible heat pumps should have only info requirements on the cooling side in lot 1 for the time being.**
- **Heat recovery and simultaneous heating and cooling are important energy saving features also for VRF units.**
- **A suggestion to include Very High Temperature Process Chillers in the scope of the new Regulation.**

Introduction and background

The Lot 21 review started in 2023 and the Commission with the study consultant presented its intended scope and envisaged timeline at the Consultation Forum meeting on 11 December 2023. Stakeholders were invited to provide their feedback after the meeting and subsequently in a Call for Evidence to be launched in Q1 2024 via the 'Have your Say' portal.

With this paper, members of the Eurovent Product Groups 'Rooftop Units', 'Liquid Chilling Packages and Heat Pumps' and 'Air Conditioners' would like to provide their suggestions on issues to be addressed in the review and tentative proposals of elements to be amended. More detailed proposals will follow at later stages of the review.

The paper is divided into chapters, each one related to a specific technology for an easier consultation.

The Eurovent secretariat and the Chairpersons of each product group involved in the review are at full disposal for further exchanges and clarification.

New Refrigerants and flammability

One common point that is shared by all the Eurovent technologies involved in the revision of lot 21 is represented by the hard challenges to be faced in the next future due to the provisions of the new Regulation on Fluorinated Greenhouse Gases and the uncertainty that the PFAS restriction proposal is imposing to the market until it will be finalised (expected in 2028).

It is currently unknown on which refrigerants will be of the future and therefore companies today can't foresee the expected efficiencies for their products. **Eurovent thereby recommends evaluating the increase of the minimum efficiency thresholds with the next revision of the Regulation** once the refrigerant market has stabilised.

New Refrigerants and flammability for Rooftop units

In addition to what was expressed in the introduction, it must be taken into account that rooftop units will be particularly challenged by the new F-Gas regulation because their refrigerant-containing pipes are directly in contact with the airflow stream that serves the rooms. Therefore, any risk of leakages must be carefully avoided, and even slightly flammable refrigerants can be forbidden on a national base. Risk of leakages is ruled by safety standards some of which (e.g. EN 378 series) are currently under revision and is not yet known which will be the requirements for the future.

Safety concerns for the transition to flammable refrigerants in VRF units

It must be taken into account that similarly to Rooftop units, also VRF units will be particularly challenged by the new F-Gas regulation.

Differently from rooftop units, VRF refrigerant-containing pipes are not directly in contact with the airflow stream that serves the rooms but are located inside or close to the conditioned rooms. This, together with the large amount of refrigerant that flows inside the pipes due to the big capacities that VRF units can reach, impose that any risk of leakages must be carefully avoided, and even slightly flammable refrigerants can be forbidden due to safety requirements in the place of operation.

Rooftops

New definition of rooftop unit

Eurovent members would like to propose to modify the definition of rooftop unit that is currently in the Regulation (EU) 2016/2281.

The reason for this is that the current definition of Regulation (EU) 2016/2281 does not sufficiently reflect the complexity and all functions of products available on the market, that have an impact on their functionality and energy efficiency. This particularly concerns the free cooling function which can contribute to a significant reduction in energy consumption. Furthermore, the amended definition should not exclude the water/brine-to-air design which is also applicable to rooftop units.

The proposed definition derives from the prEN 17625 standard with some adjustments:

Air conditioning unit which main function is space cooling or heating, or both, using a vapour compression cycle driven by electric compressor(s) and in which the evaporator, compressor, condenser and supplementary heaters are integrated into a single package. Rooftop units use recycled air or a mixture of recycled air and outdoor air on the indoor heat exchanger, and outdoor air or a mixture of outdoor air and extracted air on the outdoor heat exchanger, with capability of free cooling and may be equipped with a heat recovery system to benefit from the extracted air.

Please consider that this is a first proposal for a definition, the Eurovent Product Group (PG-RT) will continue to work on it for the Call for Evidence consultation.

Free cooling

Rooftop units with free cooling can improve the energy consumption. Considering that the study consultant is already evaluating the inclusion of the free cooling for other products, like chillers and VRF, Eurovent recommends addressing it also for rooftops.

In this respect, it is important to note that the work on the prEN 17625 is ongoing and the new standard is expected to be submitted to public enquiry in June 2024 and adopted in 2025. Members of Eurovent

are already participating in the drafting of the standard, which includes a method for considering free cooling in the efficiency calculation.

Eurovent suggests including this method as transitional method in the new Regulation until the new standard will give presumption of conformity.

Chillers and hydronic heat pumps

Reversible hydronic heat pumps

Current situation

Currently, hydronic reversible heat pumps, units that can provide heating OR cooling (with the inversion of the cycle, are therefore not able to provide heating and cooling at the same time) have different Ecodesign requirements depending on their capacity. If below 400 kW, they fall under the lot 1 Regulation, therefore covering their heating functionality, if above 400 kW they are covered by the lot 2 Regulation, therefore covering their cooling functionality.

In both cases they are compared with units specifically designed for heating or cooling only, and therefore penalised.

Please find below an extract from the position paper PP – 2023-06-20 which explains why they are penalised:

The technology of reversible units

The reversible units are a derivative of the cooling-only chillers with some modification (e.g. additional 4-way valve, another air-type heat exchanger) and their components are somehow optimized for one of the operating modes. For example, in the 4-way valve for physical reasons, there are internal leakages and thermal losses between the high-pressure and low-pressure sides. It must be also considered that in the case of a cooling-only unit, the condenser and the evaporator can be internally optimised for that task while they cannot on the reversible unit.

Reversible units have in most common cases 2 heat exchangers: one on the source side and one on the user side and, in most of the cases with traditional designs, those heat exchangers can either work in co-current mode or counter-current mode.

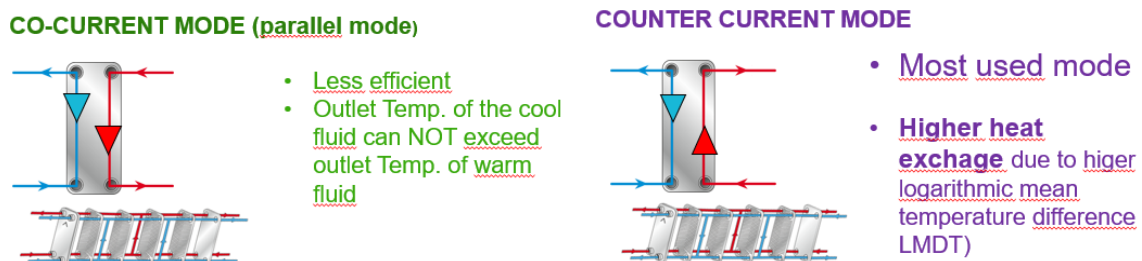


Figure 1: plate exchanger working in co-current and counter-current mode

Therefore, it is possible to design a reversible unit optimized for the cooling or heating mode (which one will be in counter-current mode). Below is a simple working scheme:

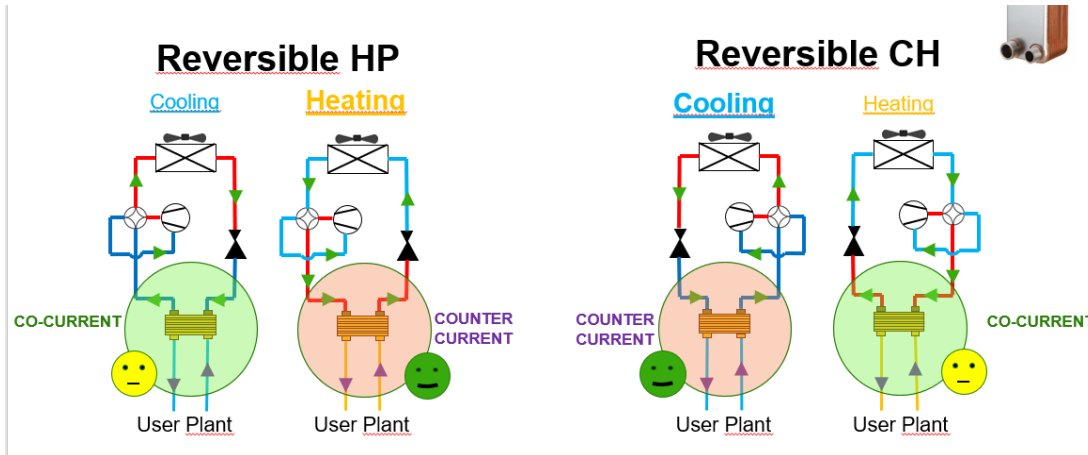


Figure 2: reversible unit optimized for heating or cooling

The result is that a unit optimized for heating will have better heating performances and worse cooling one, and vice versa.

Eurovent proposal

In the context of the revision of lot 1, Eurovent on several occasions stated that **reversible units should be covered by heating requirements only up to 1 MW heating capacity.**

Eurovent recommends to **only declare in the new Lot 1 Regulation the cooling efficiency in the manufacturer's documents for the period to come**, considering also that not all low-capacity units are tested for the cooling requirements so far. In this case the Commission can collect useful data for developing proper requirements dedicated to reversible heat pumps.

Free cooling

Eurovent supports the consideration of free cooling in the context of the revision of lot 21. Free cooling is an important feature to achieve better energy efficiency and therefore should be promoted. Eurovent recommends developing a proper definition of free cooling to establish some boundaries. It is recommended that the free cooling contribution can be verified with a proper methodology.

Polyvalent units

The slide presented at the Consultation Forum well summarizes the current situation, which is also detailed in the [Eurovent Recommendation 18-1](#).

It goes without saying that Eurovent members fully support the proposal to include polyvalent units with dedicated requirements in lot 21.

As stated during the Consultation Forum on 11 December 2023, the standardisation activity is also starting in 2024 with regard to the new calculation method developed for polyvalent units. A first meeting is planned in February 2024.

VRF units

Heat recovery

As correctly presented during the Consultation Forum on 11 December 2023, VRF systems are capable of heat recovery between heating and cooling loops. This is an important feature for the energy efficiency of the system.

Moreover, as polyvalent units, VRF units are capable of simultaneous cooling and heating.

Eurovent recommends addressing these functionalities in the new Regulation and a common methodology with polyvalent units should be considered to ensure that energy recovery is properly addressed in each seasonal efficiency indicator.

Very High Temperature Process Chillers

Currently, the Regulation (EU) 2016/2281 addresses High Temperature process chillers with inlet/outlet water Temperature at the evaporator 12/7°C with a dedicated efficiency index, called SEPR.

Considering the evolution of the market, today more and more applications request higher temperatures and a wider DeltaT and the most common application is 30-20°C (inlet/outlet water Temperature at the evaporator).

The most common application of this category of process chillers is IT Cooling where the normal approach is to apply redundancy of units to prevent failures.

According to what is mentioned above, Eurovent suggests that the new Lot 21 Regulation addresses this class of process chillers. Eurovent will provide more details in the future steps of the revision.

Eurovent and transparency

When assessing position papers, are you aware whom you are dealing with?

Eurovent's structure rests upon democratic decision-making procedures between its members and their representatives. The more than 1.000 organisations within the Eurovent network count on us to represent their needs in a fair and transparent manner. Accordingly, we can answer policy makers' questions regarding our representativeness and decisions-making processes as follows:

<p>1. Who receives which number of votes?</p> <p>At Eurovent, the number of votes is never determined by organisation sizes, country sizes, or membership fee levels. SMEs and large multinationals receive the same number of votes within our technical working groups: 2 votes if belonging to a national Member Association, 1 vote if not. In our General Assembly and Eurovent Commission ('steering committee'), our national Member Associations receive two votes per country.</p>	<p>2. Who has the final decision-making power?</p> <p>The Eurovent Commission acts as the association's 'steering committee'. It defines the overall association roadmap, makes decisions on horizontal topics, and mediates in case manufacturers cannot agree within technical working groups. The Commission consists of national Member Associations, receiving two votes per country independent from its size or economic weight.</p>
<p>3. How European is the association?</p> <p>More than 90 per cent of manufacturers within Eurovent manufacture in and come from Europe. They employ around 150.000 people in Europe largely within the secondary sector. Our structure as an umbrella enables us to consolidate manufacturers' positions across the industry, ensuring a broad and credible representation.</p>	<p>4. How representative is the organisation?</p> <p>Eurovent represents more than 1.000 companies of all sizes spread widely across 20+ European countries, which are treated equally. As each country receives the same number of votes, there is no 'leading' country. Our national Member Associations ensure a wide-ranging national outreach also to remote locations.</p>

Check on us in the [European Union Transparency Register](#) under identification no. 89424237848-89.

We are Europe's Industry Association for Indoor Climate (HVAC), Process Cooling, and Food Cold Chain Technologies – thinking 'Beyond HVACR'

Eurovent is Europe's Industry Association for Indoor Climate (HVAC), Process Cooling, and Food Cold Chain Technologies. Its members from throughout Europe represent more than 1.000 companies, the majority small and medium-sized manufacturers. Based on objective and verifiable data, these account for a combined annual turnover of more than 30bn EUR, employing around 150.000 people within the association's geographic area. This makes Eurovent one of the largest cross-regional industry committees of its kind. The organisation's activities are based on highly valued democratic decision-making principles, ensuring a level playing field for the entire industry independent from organisation sizes or membership fees.

Eurovent's roots date back to 1958. Over the years, the Brussels-based organisation has become a well-respected and known stakeholder that builds bridges between the manufacturers it represents, associations, legislators and standardisation bodies on a national, regional and international level. While Eurovent strongly supports energy efficient and sustainable technologies, it advocates a holistic approach that also integrates health, life and work quality as well as safety aspects. Eurovent holds in-depth relations with partner associations around the globe. It is a founding member of the ICARHMA network, supporter of REHVA, and contributor to various EU and UN initiatives.