Position Paper PP – 2021-04-30

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Eurovent comments to draft working documents on Ecodesign requirements for VU and Energy Labelling of RVUs

In a nutshell

Following the Consultation Forum meeting concerning the proposals made in draft working documents on Ecodesign requirements for VU and Energy Labelling of RVUs, Eurovent provides in this paper its comments on proposed amendments regarding:

- **Ecodesign requirements for non-residential ventilation units**
- **Ecodesign requirements for residential ventilation units**
- **Energy Labelling Requirements for residential ventilation units**

Introduction

Consultation Forum Meeting on the review of the Ecodesign and Energy Labelling regulations on ventilation units took place on 30 March 2021. It was preceded by making available the draft working documents.

Eurovent welcomes the proposal for amended ecodesign and energy labelling provisions for ventilation units set out in draft working documents '2021 0222 ED-no TC' and '2021 0222 EL-no TC' published on 1 March 2021. Eurovent members appreciate that most of the industry motions were taken into consideration in the review.
After reviewing the draft working documents and clarifications made at the Consultation Forum meeting, we would like to provide the following comments from Eurovent members.

1 Non-residential Ventilation Units - Ecodesign Requirements (Review EU1253/2014)

1.1 Requirements for known and unknown place of installation

Reference: Annex III - Specific ecodesign requirements for NRVUs

Eurovent fully supports the proposal for separate requirements for BVUs with known and unknown place of installation, or in other words with known or unknown minimum outdoor temperature.

We are confident that, wherever needed and justified, lower requirements for the temperature ratio combined with higher requirements for SFP_{int_limit} will contribute for further energy savings and decarbonisation.

We also believe that making requirements dependent on the outdoor temperature does not create additional burdens and challenges for market surveillance, which were indicated by some Member States during the Consultation Forum meeting. In our view, the outdoor temperature is another input parameter declared by a manufacturer for the conformity assessment, similar to the airflow rate or external pressure drop. All these parameters can be verified by market surveillance in a similar way based on product and ventilation system documentation.

In addition, for the sake of simplicity, we propose to use the same formulas for the case with a known and unknown installation site (see also 1.4.3).

1.2 Different min. requirements for RAC and other ERS should be kept

Reference: Annex III - Specific ecodesign requirements for NRVUs

Eurovent fully supports the proposal to maintain different requirements for the minimum temperature ratio (η_{t_nrvu}) for the run-around ERS and other ERS.

Current requirements (ErP2018) are at the limit of what is reasonable and economically justifiable for this kind of exchangers. Further increase in requirements would lead to the abandonment of this technology, which is not acceptable from the market perspective since in many applications there is no alternative for RAC.

To meet even higher requirements, the design face air velocity across run-around coils has to be very low. But it must be noted that with much reduced air velocity (compared to the design velocity), which occurs most of the time with Ventilation Demand Control, the efficiency of the RAC drops dramatically. In this context, enforcement of VDC (by means of C factor) in connection with higher requirements for RAC, would be opposing.

1.3 Comments to proposed requirements for η_{t_nrvu} , η_{e_nrvu} and SFP_{int_limit}

1.3.1 Including C control bonus in SFP_{int_limit}

Reference: Annex III - Specific ecodesign requirements for NRVUs

General comments

- Minimum requirements for VU controls should be set without influencing SFP_{int_limit} (No C bonus). The aim is to exploit the synergy of higher performance of the VU and smart controls, and not to compensate lower efficiency of the VU with smart control functions.
- The definition of controls 'that are co-purchased and co-delivered' is vague and open ended. Requirements given in table 6 'Control bonus C' are ambiguous and do not refer to any reference standard that could be used for compliance assessment. This creates room for a loophole, misinterpretation and even circumvention of requirements.
- With the current proposal and values of C factors (benefit up to 26%), the $SFP_{int-limit}$ for NRVU with smart controls is higher than the current ErP2018 limit. This together with vague definition of co-purchased and co-delivered controls **may lead to widespread placing on the market of low-efficiency VUs with smart controls of which functions will not be used in practice. As result, the energy consumption of ventilation systems will be higher than it is today.** Such a scenario is likely, since the cost of delivering smart (ready) controls may be considerably lower compared to the cost of more effective (bigger) ventilation unit.
- There are many applications where ventilation units are (and must be, for instance due to technological reasons) supplied without a control system, that is installed by a contactor. This makes the responsibility for the ecodesign compliance distributed and unclear, and in turn renders market surveillance more challenging, if possible at all.

Eurovent position

- Set minimum requirement for control system without influencing $SFP_{int-limit}$.
- Control systems may be co-delivered by the NRVU manufacturer or supplied by the on-site installer. Lay down clear requirements regarding the responsibility for ecodesign compliance

for both delivery options and both entities. A proposal for the solution was presented in Eurovent PP-2020-06-03.

- A possible solution could be to set minimum requirements for each control system and apply the C bonus only for advanced control options. (See also point 1.4.4)

1.3.2 Errors in formulas for SFP_{int_limit}

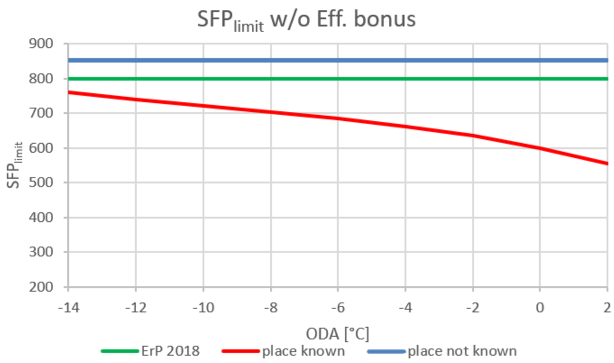
Reference: Annex III - Specific ecodesign requirements for NRVUs

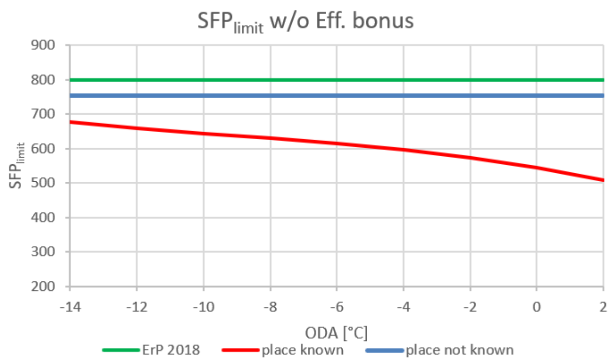
If the postulate outlined in point 1.3.1 cannot be met, we would like to point out that the proposed equations for calculating the SFP_{int_limit} may contain errors. It appears that while using various C factors, requirements for known and unknow place of installation at the lowest outdoor temperature are different. In addition, formulas for a known and unknown location are not consistent. The following graphs illustrate the problem.

C=1,15 x 1,1 (270W/m³/s for filters)

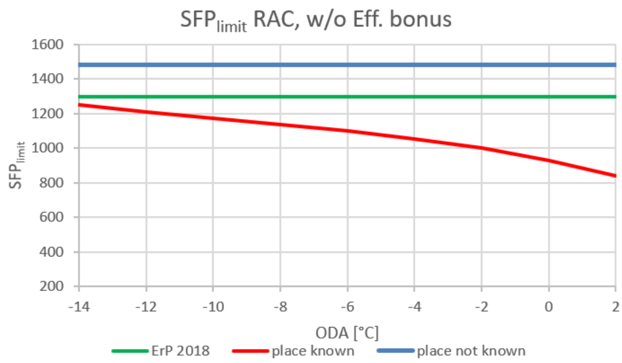
C=1,05 x 1,0 (270W/m³/s for filters)

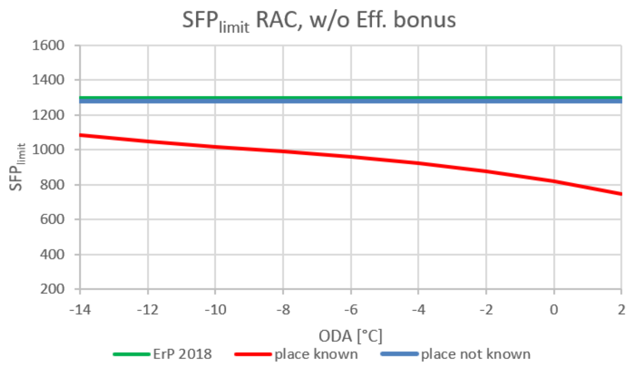
For Other ERS





For RAC





Eurovent position

- Equations need to be corrected so that $SFP_{int\text{-}limit}$ value is the same for known and unknow place of installation at the lowest outdoor temperature.
- The equations need to be improved to ensure that for the best case of smart controls (highest C value), **the SFP_{int_limit} value is no higher than the current ErP 2018 limit**. (to avoid potential circumvention of ecodesign requirements explained in point 1.3.1)

- The equations should allow for consideration of multi-stage filtration.

Considering the issues indicated above, in point 1.4 Eurovent proposes amended requirements.

1.4 Eurovent proposal for amended requirements for η_{t_nrvu} , η_{e_nrvu} and SFP_{int_limit}

The below proposals for *the required temperature efficiency depending on outdoor design temperature (1.4.1)* and the *maximum basic specific fan power* (1.4.2) originate from the Eurovent Position Paper PP-2020-06-16 and remain unchanged.

1.4.1 Required temperature efficiency depending on outdoor design temperature

The base BVU energy recovery efficiency η_{e_base} requirements are

for outdoor design temperatures t_{ODA} below and up to -14 °C

73 %

for outdoor design temperatures t_{ODA} between -14 and 2.5 °C

$-1.02 * t_{ODA} - 0.058 * t_{ODA}^2 - 0.00134 * t_{ODA}^3 + 66.44$ %

for outdoor design temperatures t_{ODA} from and above 2.5 °C

63.5 %

Minimum requirements for different HRS types are

for BVU with run-around HRS the temperature efficiency η_{e_nrvu} is

η_{e_base} - 5 %-point

for BVU with moisture HRS the calculated energy efficiency η_{e_nrvu} is

η_{e_base} + 2 %-points

for BVU with other HRS the temperature efficiency η_{e_nrvu} is

η_{e_base} %

1.4.2 Required maximum basic internal specific fan power

The basic specific fan power of a HRS (SFP_{HRS_base}) is

for outdoor design temperatures t_{ODA} below and up to -14 °C

388

for outdoor design temperatures t_{ODA} between -14 and 2.5 °C

$-15.42 * t_{ODA} - 0.907 * t_{ODA}^2 - 0.0323 * t_{ODA}^3 + 261$

for outdoor design temperatures t_{ODA} from and above 2.5 °C

216

The required value for the BVU consists SFP_{HRS_base} , a bonus factor based on the required efficiency (E), an additional fixed value which is proposed to be altered for different tiers and the additional amounts for the filters.

Requirements for different HRS types in the calculation of the correction factor (E) are

for BVU with run-around HRS the reference efficiency η_{e_ref} is

η_{e_base} - 5 %-points

for BVU with BVU moisture and other HRS the reference efficiency η_{e_ref} is

η_{e_base} %

$E = \eta_{e\_act} / (1 - \eta_{e\_act}) * 1/ \eta_{e\_ref} * (1 - \eta_{e\_ref})$

η_{e_act} is the energy efficiency that is built in the specific ventilation unit.

1.4.3 Proposal for maximum internal specific fan power ($SFP_{int\text{-}limit}$) in W/(m³/s)

The updated proposal for $SFP_{int\text{-}limit}$ (W/(m³/s)) is as follows:

for BVU with run-around HRS

- $A \times C \times (840 - 140 * q_{nom} + E * SFP_{HRS\_base} + F_{sup} + F_{exh})$ if $q_{nom} < 2$ m³/s and
- $A \times C \times (560 + E * SFP_{HRS\_base} + F_{sup} + F_{exh})$ if $q_{nom} \geq 2$ m³/s

for BVU with other HRS the additional value $SFP_{int,\ HRS,\ add}$ is

- $A \times C \times (375 - 140 * q_{nom} + E * SFP_{HRS\_base} + F_{sup} + F_{exh})$ if $q_{nom} < 2$ m³/s and
- $A \times C \times (95 + E * SFP_{HRS\_base} + F_{sup} + F_{exh})$ if $q_{nom} \geq 2$ m³/s

Where:

A - is an adjustment factor equal to **0.83** to ensure that for a unit equipped with all smart control options (C = 1.15 x 1.1) the $SPF_{int\text{-}limit}$ value is approximately the same as the current ErP2018 limit. For units without smart controls (C = 1), the $SPF_{int\text{-}limit}$ is approximately 25% lower compared to ErP2018 requirements.
For a future Tier, the A factor can be further reduced to raise requirements but without changing the overall methodology.

C - is the control bonus

F_{sup} - is the sum of F factors for all filtration stages (if applicable) in the supply air stream according to table 5 of Annex VII

F_{exh} - is the sum of F factors for all filtration stages (if applicable) in the exhaust air stream according to table 5 of Annex VII

Table 5.
Filter correction factors 'F'

Filter class							
ISO ePM1		ISO ePM2,5		ISO ePM10		ISO Coarse	
class	*F*	*class*	*F*	*class*	*F*	*class*	*F*
≥ 50%	**150**	≥ 50%	**135**	≥ 50%	**120**	≥ 60%	**70**
≥ 70%	**185**						
≥ 80%	**210**						

To simplify the methodology, Eurovent proposes using the same formulas for both known and unknown installation place. If the installation place is unknown, the minimum outdoor temperature of -14°C must be taken into account.

1.4.4 Definition of C control bonus

Reference: Annex VII - Measurement methods and calculations for NRVUs – Table 6
In the opinion of Eurovent members, the definitions of 'smart control options' and NRVU-package' as well as the phrases 'co-purchased' and 'co-delivered' are not accurate and too general, which may lead to a loophole and misinterpretation. These definitions should be more specific. The basis for improvements could be the proposal set out in the EVIA paper of 15 May 2020.

Moreover, following the original position paper PP-2019-11-22, Eurovent holds that the VDC function (corresponding to option 1 of C factor in table 6 – ' Interface for allowing VDC-devices' = 1.05) should be mandatory in any case. Thus, we propose to lay down this option as compulsory and permanently implement C = 1.05 by means of A factor = 0.83 x 1.05 (see also point 1.4.3). The C-factor could then only correspond to values which in the current draft range from 1.1 to 1.15 x 1.1.

1.5 Definition 'reference configuration'

Reference: Annex I - Definitions applicable for the annexes - Specific definitions for NRVUs
Definitions (3) and (4) should make clear that the reference configuration includes clean filters.

(3) 'reference configuration of a BVU' means a product configured with a casing, at least two fans with variable speed or multi-speed drives, an ERS, and the clean filters according to the manufacturer instructions;

(4) 'reference configuration of an UVU' means a product configured with a casing and at least one fan with variable speed or multi-speed drive, and the clean filter according to the manufacturer instructions;

1.6 Definition 'nominal flow rate (q_{nom})'

Reference: Annex I - Definitions applicable for the annexes - Specific definitions for NRVUs
The working draft document proposes the following definition.

(6) 'nominal flow rate (q_{nom})'(expressed in m^3/s) means the declared design flow rate of an NRVU distributed to and/or extracted from the building, including any leakages or any pressure balancing flow at standard air conditions 20 °C and 101325 Pa, whereby the unit is installed complete (for example, including filters) and according to the manufacturer instructions; in case the design flow rate is not known, 'nominal flow rate' refers to the range of design flowrates and related external pressure ($Q/\Delta P$-values) for which the minimum requirements are met, and has to be indicated with at least five $Q/\Delta P$-points for which nominal flow rate, ΔP_{ext}, SFP_{int}, η_{vu} (if applicable), $\Delta P_{s,ext}$ and L_{wa} are given

Eurovent welcomes the amendment to this definition proposed by Eurovent to take into account the impact of internal leakage on SPF_{int} and leading to the energy savings estimated in our PP-2020-12-18.

However, **we would like to make clear that SFP_{int} needs to be calculated taking into account any leakages**. In this respect, we are concerned that there is room for misinterpretation of the term 'the declared design flow rate' which can result in a loophole. One might assume that the design air flow rate is explicit and refers to the definition of the purpose of the ventilation unit in the 2nd Article 2 paragraph to replace indoor air by outdoor air, in order to extract and dilute indoor air but that is not clear and there is a need for a clear and unambiguous definition of 'the declared design flow'. Therefore, we propose that 'the declared design flow' is defined in the Annex I. as follows:

*'**Design flow rate** (q_v)' (expressed in m³/s) means the flow rate of outdoor air that is designed to be distributed to the building and/or extracted from the building.*

Alternatively, the term 'Nominal air flow rate' could be altered as follows:

*(6) '**nominal flow rate (q_{nom})**'(expressed in m³/s) means the declared design flow rate of outdoor- or extract air flow of an NRVU distributed to and/or extracted from the building, including any leakages or any pressure balancing flow at standard air conditions 20 °C and 101325 Pa, whereby the unit is installed complete (for example, including filters) and according to the manufacturer instructions; in case the design flow rate is not known, 'nominal flow rate' refers to the range of design flowrates and related external pressure (Q/Δ P-values) for which the minimum requirements are met, and has to be indicated with at least five Q/Δ P-points for which nominal flow rate, ΔP_{ext}, SFP_{int}, η_{vu} (if applicable), $\Delta P_{s,ext}$ and L_{wa} are given.*

Either of these proposals clarify the definitions and remove the ambiguity so as to close the potential loophole.

1.7 Nomenclature of temperature and humidity ratio

Reference: Annex I - Definitions applicable for the annexes - Specific definitions for NRVUs
The working draft document proposes the following definitions.

(11) 'temperature ratio of a non-residential ERS (η_{t_nrvu})' means the ratio between supply air temperature gain and the extract air temperature minus outdoor air temperature, measured under dry reference conditions, with balanced mass flow at nominal airflow rate, an indoor-outdoor air temperature difference of 20 K, excluding thermal heat gain from fan motors and from internal leakages;

(12) 'humidity ratio of a non-residential ERS (η_{x_nrvu})' means the ratio between the change in humidity content of the supply air and the change in humidity content of the exhaust air, both relative to the humidity content of the outdoor air, measured at summer air conditions, with balanced mass flow at nominal airflow rate.

We welcome commissions response to review the definitions of these two terms. However, the word '*ratio*' is already replaced with '*efficiency*' in prEN 308. In this context, the word efficiency is accepted in the ventilation industry. If the Regulation now switches to the use of the word 'ratio' it may cause confusion, which would be unfortunate.

Eurovent proposes to use Terms Temperature efficiency and Humidity efficiency.

1.8 Requirements as regards filters

Reference: Annex III - Specific ecodesign requirements for NRVUs
Eurovent welcomes implementation of the maximum annual energy consumption (AEC) based on the EUROVENT 4/21-2019 Recommendation. However, the current text of the draft working document does not contain an essential exemption presented in our proposal to exclude filters operating at face velocity below 1.2 m/s (1500 m³/h @592x592). These filters cannot be rated according to EUROVENT 4/21 but their pressure drop is very low and not relevant for the energy efficiency.
Thus, we propose adding the following statement:

Requirements for AEC do not apply for filters with air face velocity < 1.2 m/s.

1.9 Requirements as regards material efficiency

Reference: Annex III - Specific ecodesign requirements for NRVUs

In the opinion of Eurovent members requirements for the material efficiency given in points (a) and (b) are suitable for typical consumer goods but are not relevant for Ventilation Units. Thus, we propose:

Change

(a) Availability of spare parts: Manufacturers, importers or authorised representatives of NRVUs shall make available to the customer a list of spare parts and the procedure for ordering them, for a minimum period of 7 years after placing the unit on the market.

To

(a) Availability of spare parts: Manufacturers, importers or authorised representatives of NRVUs shall make a list of spare parts and ordering procedure available to the customer. Spare parts shall be available for a minimum period of 7 years after placing the unit on the market. Spare parts can be original components or alternative solutions to repair the unit and ensure it runs as designed.

Remove

(b) Maximum delivery time of spare parts: During the period mentioned under point (a), the manufacturer, importer or authorised representatives shall ensure the delivery of the spare parts for NRVUs within 8 weeks after having received the order.

Point (b) is not appropriate for the NRVU market because components can be on long delivery time. NRVUs have along service life of 20 years or more and often it may be necessary to find an alternative solution when components go out of production at the sub-suppliers.

1.10 Requirement for a thermal by-pass facility

Reference: Annex III - Specific ecodesign requirements for NRVUs

Use of the thermal by-pass facility in some applications requiring heat recovery all year long is not justified. It leads to higher pressure drop and increased energy consumption. Thus, we propose to change the requirement as follow:

The ERS shall have a thermal by-pass facility, except for duly justified cases (notably swimming-pool or high supply air temperature application), requiring heat recovery all year long.

1.11 Information requirements for NRVUs with ERS and HP

Reference: Annex V - Information requirements for NRVUs with ERS and HP

Definition of internal specific system power SSP_{int} is missing in Annex VIIa (Transitional Methods)

1.12 Verification tolerances for moisture efficiency

Reference: Annex VII - Verification procedure for market surveillance purposes

Verification tolerances for moisture efficiency RVU and NRVU are missing in table 4.

1.13 Consideration of non-residential BVU with recirculation

1.13.1 Improvement of definitions

Reference: Annex I - Definitions applicable for the annexes - Specific definitions for NRVUs

For technological reasons, many ventilation systems require exhaust air recirculation in bidirectional NRVUs which implies that the airflow through the outdoor and exhaust air part of a unit with HRS may be different that in the part for supply and extract air part. This raises questions about the correct declaration and assessment of conformity, particularly regarding the energy recovery components that cannot be sized for supply /extract air flow due to technical limitations. The current draft working document on the revised ecodesign requirements does not give answer to these questions. Therefore, Eurovent members would appreciate to reconsider the implementation of proposals made in the Eurovent consolidated paper PP-2019-11-22 , notably the following amended definitions:

*'**internal pressure drop of ventilation components** (Δps,int)' (expressed in Pa) means the sum of the static pressure drops of a reference configuration of a BVU or an UVU at nominal flow rate. For the BVU including recirculation air and with outdoor air flow rate between 10% and 100% of nominal flow rate, static pressure drops of the reference configuration are considered for maximum declared outdoor air flow rate under winter heating conditions (whenever heat recovery is used).*

*'**thermal efficiency of a non-residential HRS** (ηt_nrvu)' means the ratio between supply air temperature gain and the exhaust air temperature loss, both relative to the outdoor temperature, measured under dry reference conditions, with balanced mass flow, an indoor-outdoor air temperature difference of 20 K, excluding thermal heat gain from fan motors and from internal leakages. For a BVU including recirculation air and with outdoor air flow rate between 10% and 100% of the nominal flow rate, the maximum declared outdoor air flow rate under winter heating conditions (whenever heat recovery is used) is considered.*

1.13.2 Exclusion of requirements for EATR

Reference: Annex III - Specific ecodesign requirements for NRVUs

In non-residential BVUs with recirculation function, mixing of extract air and supply air (very high EATR value) is deliberately assumed at the design stage of the ventilation system. Setting an EATR limit and correcting the SFP_{int} accordingly is thus not justified in such cases. Eurovent therefore proposes to add the following exemption:

If a non-residential BVU has the recirculation function during its regular operation (building occupied by people) the EATR limit shall NOT be applicable.

1.14 Exclusion of historical buildings

Reference: Article 1 - Subject matter and scope

Eurovent welcomes the proposal to exclude from the Regulation scope building officially protected as part of a designated environment or because of its special architectural or historical merit.

In order to avoid potential circumvention of this provision, Eurovent proposes to further specify the scope of the exemption. Suggested possible solutions include:

- Reference to the relevant Member States' inventories in which a building must be listed to be considered as officially protected.
  Examples of the approach to the definition and identification of historic landmark building in different Member States are given in PP-2019-11-27.
- Mandatory notification to national market surveillance authorities and submission of documentation justifying the exemption (following the approach applied in the Regulation for power transformers).

2 Residential Ventilation Units - Ecodesign Requirements (Review EU1253/2014)

2.1 CTRL factors / SEC / VPI

Reference: Annex VI - Measurement methods and calculations for RVUs – Table 3 and Annex I - Definitions applicable for the annexes

General comments

- The proposed approach (extended CTRL factors table + VPI) excessively combined product performance and system performance.
- The energy efficiency of the VU is not in focus, and the assessment of SEC includes key impacting system-related factors that are beyond manufacturer's control.
- The responsibility to define energy class lays with the installer. This is contrary to fundamental principles of Ecodesign Directive and accordingly to EU1253/2014 and EU1254/2014 which are product and not system related.

Specific comments regarding CTRL and RVU-package definition.

- The definition of 'ventilation controls' is open-ended. It introduces the term 'RVU-package' which means all control devices purchased together with the RVU that are needed to meet the energy class. RVUs are normally mass produced and distributed via sales network or wholesalers. The specific design of a system in which a unit will be installed is not known to the manufacturer / distributor. This means that **it is not possible to verify whether the offered RVU package meets the needs of the system (number of zone vales, sensors etc), which may lead to a loophole and misuse of energy labelling**.
- Another information which is not available to the manufacturer or distributor is the architecture of a ventilation system related to the BVU1 or BVU2 type of the RVU. Thus, it cannot be correctly assessed when selecting CTRL factors.
- It must be also noted that not all RVU manufacturers offer control devices installed in the ductwork. The proposed approach would not contribute to the levelled playing field and would force some producers to change their business profile.

Furthermore, the draft Excel tool shows how the SEC is calculated from the CTRL factors. But it is fundamental that the consultant makes explicit how each of these CTRLs has been calculated and shows everyone the method of calculation of this factors: otherwise no one will be able to use coefficients whose justification will not be understood or proven.

Eurovent position

Ecodesign and Energy labelling requirements for RVUs should only consider product related features and performance (including availability of its control system to deliver DCV and central/zonal/local airflow control), but without taking into consideration of the system design and system components which are not a part of the VU. Due to variety of design options, it is not possible to develop unambiguous definitions of RVU-packages.

An option for improvement of current provisions could be the proposal made in EVIA position of 5 March 2021 (EVIA Comments on Residential Ventilation Units Control Aspects), which puts forward an extended but still simple table of CTRL factors including the impact of airflow control (central/zonal/local).

If the intention of the revised Regulations is to split the responsibility for compliance between the manufacture/distributor and the installer, then the scope of remint of both entities must be clearly laid down. Possible solution could be splitting label into easy to understand product label provided by manufacturer, and system label done by the architect or installer – all at given reference points.

2.2 Maximum internal and external leakage rates

Reference: Annex II - Specific ecodesign requirements for RVUs

Maximum leakage rate should be amended as follows:

The maximum internal and external leakage rates (%) for ducted BVUs shall be less than 7% when the pressurization test is used, less than ~~4~~ 7% when the in-duct tracer gas test is used, and less than ~~6~~ 10% when the chamber tracer gas method is used

Recuperative (test method A)	Regenerative (test method B)	Regenerative (test method C)
External leakage 7% (pressure)	External leakage + Internal leakage =10% (chamber tracer gas)	External leakage 7% (pressure)
Internal leakage 7% (pressure)		Internal leakage 7% (In-duct tracer gas)
In draft External 7% Internal 7%	In draft Internal+External =6%	In draft External 7% Internal 4%

Otherwise most rotary units would not meet the limit and disappear from the market. This energy efficient technology should not be eliminated.

Additional clarification

Assuming that methods and limits would be reviewed, in the original position paper, Eurovent has proposed to set the following internal leakage limits (according to prEN 13141-7:2019):

- A2 for BVUs with recuperative HRS
- C3 for BVUs with regenerative HRS and in-duct tracer gas method
- B3 for BVIS with regenerative HRS and chamber tracer gas method.

However, this proposal was made together with another request to define a unified test method for different type of heat exchangers and the unified limits (see also point 2.3). Following provision of EN 13141-7, the intention here was to provide for accurate leakage measurement uncertainty and not for setting an ecodesign limit that would apply to a product when placed on the market. As the unified test method was not proposed in the draft revised Regulation, setting the limits only would results in severe difficulties to meet new requirements for a considerable part of product on the market. This could also lead to prevent larger rotary wheel that gives better temperature efficiency.

2.3 Correction of temperature efficiency η_t due to internal leakages

Reference: Annex VI - Measurement methods and calculations for RVUs – Table 5

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Eurovent supports correcting thermal efficiency due to internal leakages, but as we stated in our previous position papers, the formula for η_1 in prEN13142, now directly quoted in the Regulation is incorrect and cannot be used for energy rating. It does not distinguish:

- method for internal leakage test (pressure test / tracer gas method)
- rotation speed of the rotor

These two aspects have significant impact on the value of 'w' factor in η_1 formula, thus its outcome **cannot be used for fair and unambiguous comparison of various technologies**.

To clarify the problem, Eurovent together with Hochschule Luzern, carried out a study 'Comparative test and analysis of internal leakages in bidirectional RVU by various test methods'. Two RVUs of the same reference flow of 280 m^3/h, but one with a rotary, and the second with counterflow heat exchangers were tested with three available testing methods. The results showed huge differences in 'w' value in each case. See extract of the tests reports below:

Table 1: Overview of the leakages of the Plate RVU

Method	External leakage	Internal leakage	Class	Limits for each class	
A (Pressure)	1.0 %	1.8 %	A1	≤ 3 %	≤ 3 %
B (Chamber)	$R_{s,tot}$ = 1.1 %		B2	≤ 2 %	
C (In-duct)	1.0 %	0.6 %	C2	≤ 3 %	≤ 2 %

Table 2: Overview of the leakages or the Rotary RVU, rotor speed 0 rpm

Method	External leakage	Internal leakage	Class	Limits for each class	
A (Pressure)	0.6 %	3.4 %	A2	≤ 7 %	≤ 7 %
B (Chamber)	$R_{s,tot}$ = 1.7 %		B2	≤ 2 %	
C (In-duct)	0.6 %	0.9 %	C2	≤ 3 %	≤ 2 %.

Table 4: Overview of the leakages or the Rotary RVU, rotor speed 8 rpm

Method	External leakage	Internal leakage	Class	Limits for each class	
A (Pressure)	0.6 %	3.8 %	A2	≤ 7 %	≤ 7 %
B (Chamber)	$R_{s,tot}$ = 4.1 %		B3	≤ 6 %	
C (In-duct)	0.6 %	3.3 %	C3	≤ 3 %	≤ 4 %

Eurovent position

- Do not apply in the Regulation any correction related to 'w' factor. (Do not use an item for η_1 when calculating η_5).
- The issue must be solved at the standardisation level first.
- Eurovent initiates the discussion with the exports of CEN/TC156 WG2 in charge of the relevant EN 13142 and EN13141-7 in order to have the problem resolved at the next revision of these standards.

2.4 Q_{defr} for recuperative heat exchangers without humidity transfer

Reference: Annex VI - Measurement methods and calculations for RVUs – Table 4

A number of frost protection strategies are marked in the table as not applicate for cold climate. However, these methods are effectively applied in Nordic countries and should not be eliminated from the market. Table 4 in the draft revised Regulation originates from prEN 13142. As we clarified with the author of approach proposed in prEN 13142, these methods were left blank in the standard not because they were not technically feasible or economically justified, but just because the scope of study behind this method did not fully cover cold climate. The missing Q_{derf} values may be completed.

Eurovent position

- Fill in values for all defrosting methods or mark with clear indication of restricted application area.
- Include in the table also humidity transferring energy recovery exchangers which are subject to frosting.
- Change table title to: Q_{defr} for ~~recuperative~~ heat exchangers in units with defrosting function ~~without humidity transfer~~
- In order not to inhibit innovations, provide in the Regulation general methodology for determination of Q_{defr} value for future technologies.

2.5 All BVUs shall have a thermal by-pass facility

Reference: Annex II - Specific ecodesign requirements for RVUs

Due to limited dimension of BVUs with power input below 30W per air steam, requirement for having a thermal by-pass facility should not apply to these units, notably equipped with a plate heat exchanger.

2.6 Requirements as regards material efficiency

Requirements for material efficiency for RVUs are missing and should be completed.
The requirements for RVUs should be the same as for NRVUs (see point 1.9)

2.7 Maximum L_{WA} for non-ducted RVUs

Reference: Annex II - Specific ecodesign requirements for RVUs

The requirement should be specified as follows:

Non-ducted RVUs, including ventilation units intended to be equipped with one duct connection on either supply or extract air side shall have a maximum L_{WA} of 35 dB at the reference air flow rate.

3 Residential Ventilation Units – Energy Labelling Requirements (Review EU1254/2014)

3.1 Use one common energy rating and label for UVU and BVU

Eurovent fully supports maintaining one common energy rating and energy label for residential UVUs and BVUs. Both types of products serve for ventilation function related to the consumption of electricity and thermal energy. Thus, the energy efficiency rating communicated to the end user by means of the energy label must be the same for UVUs and BVUs.

3.2 Information displayed on the label

- Do not include VPI on the energy label
- Show Energy efficiency class for each climate.
- Display on the label **reference airflow rate** and **sound power level at the reference airflow rate**
- Present filtration efficiency according to EN ISO 16890 classification.
- Show on the energy label filter by-pass leakage indicator.

Contents

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:

1. Who receives which number of votes?	**2. Who has the final decision-making power?**
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.	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.
3. How European is the association?	**4. How representative is the organisation?**
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.	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.

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.

Delivery annotation

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Concerns	Eurovent comments on draft working documents '2021 0222 ED-no TC' and '2021 0222 EL-no TC' and the Consultation Forum Meeting on the review of the Ecodesign and Energy Labelling regulations of 30 March 2021.