EUROVENT
EUROPEAN INDUSTRY ASSOCIATION

Product Group 'Residential Air Handling Units' PP – 2019-03-28

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Eurovent consolidated Position Paper concerning Revision of Commission Regulation (EU) No 1253/2014 and Commission Delegated Regulation (EU) No 1254/2014

Scope: Residential Ventilation Units

In a nutshell

Within this Position Paper, the Eurovent Association provides its in-depth, preliminary positions concerning the ongoing review of Commission Regulation (EU) No 1253/2014 (ecodesign requirements for ventilation units) and Commission Delegated Regulation (EU) No 1254/2014 (energy labelling)

Given the large amount of input, this Position Paper is being split into the following sections:

Important remarks

This Position Paper covers residential ventilation units only. Non-residential ventilation units are being dealt with in a separate Position by our Product Group 'Air Handling Units'.

While no major changes are being expected, these Positions remain subject to a final vote by members of the Eurovent Product Group 'Residential Air Handling Units'

Authors

The above-mentioned Positions derive from joint the efforts of the Eurovent Product Group 'Residential Air Handling Units', which represents more than 50 manufacturers of residential ventilation units across Europe. Whenever necessary, our Product Groups 'Energy Recovery Components' and 'Air Filters' as well as statistical experts of Eurovent Market Intelligence were consulted to guarantee the highest possible validity.

Review background

In February 2019, the European Commission has initiated the Review Study concerning its Ecodesign and Energy Labelling Regulations on Ventilation Units. The review is being carried out by VHK and managed by Vito. It will include the review of existing Regulations EU 1253/2014 (Ecodesign requirements for ventilation units) and EU 1254/2014 (energy labelling of residential ventilation units).

I. Eurovent Position 1 of 5: The need to provide further clarifications and amendments in the regulatory text

In a nutshell

With this Position Paper, Eurovent and its members provide the European Commission with a proposal of amendments in the regulatory text in order to limit the space for its interpretation and to better regulate some ambiguous issues which have surfaced after a publication of the regulation.

The proposed amendments derive from the Eurovent/EVIA Guidance Document on Ecodesign requirements for VUs, which has been developed based on practical experiences of manufactures associated in Eurovent and EVIA.

Background

According to Article 8, the European Commission Regulation (EU) No 1253/2014 (Ventilation Units) is subject to review. Eurovent believes, this make opportunity for improving some content leaving too much room for different interpretations.

Proposal

Below Eurovent provides concrete proposals of the updates in the regulatory text in respect of Residential Ventilation Units (RVU). Suggested amendments are market red.

Regulation 1253/2014

Reference	Current text	Proposed amended text
ANNEX I	2. Definitions: ...	2. Definitions: ... New [-] 'ventilated zone' means an applied ventilation in a part of the building served by the ventilation system
	(25)'local demand control' means a demand control for a ventilation unit that continuously regulates the fan speed(s) and flow rates based on more than one sensor for a ducted ventilation unit or one sensor for a non-ducted unit;	(25)'local demand control' means a demand control for a ventilation unit that continuously regulates the fan speed(s) and flow rates based on more than one sensor for a ducted ventilation unit placed in minimum two individually ventilated zones or one sensor for a non-ducted unit;
	(35) 'thermal by-pass facility' means any solution that circumvents the heat exchanger or controls automatically or manually its heat recovery performance, without necessarily requiring a physical	(35) 'thermal by-pass facility' means any solution that circumvents the heat exchanger or controls automatically or manually its heat recovery performance, without necessarily requiring a physical airflow bypass (for

	airflow bypass (for example: summer box, rotor speed control, control of air flow);	example: summer box, rotor on/off speed control, control of air flow);
ANNEX IV	(h) maximum flow rate in m^3/h;	(h) maximum flow rate in m^3/s;

Regulation 1254/2014

Reference	Current text	Proposed amended text
ANNEX VIII Point 2.	The annual electricity consumption per 100 m^2 floor area (AEC) (in kWh/a electric per year); and the annual heating saved (AHS), which means the annual saving in consumption of energy for heating (in kWh fuel gross calorific value per year) are calculated as follows, using the definitions in point 1, and the default values given in Table 1, for each type of climate (average, warm and cold):	The annual electricity consumption per 1 m^2 floor area (AEC) (in $kWh/(m^2 .a)$ electric per year); and the annual heating saved ((AHS), which means the annual saving in consumption of energy for heating (in $kWh/(m^2 .a)$ fuel gross calorific value per year) are calculated as follows, using the definitions in point 1, and the default values given in Table 1, for each type of climate (average, warm and cold):

II. Eurovent Position 2 of 5: The appropriateness of taking into account the effects of low-energy consuming filters on the energy efficiency

In a nutshell

Taking into account the effects of low-energy air filters on the energy efficiency of ventilation units constitutes a mandatory revision item. Eurovent and its members believe that this revision provides for a major opportunity to rightly account not only for a higher energy efficiency, but also a better indoor air quality and machine maintenance.

Within this Position Paper, in respect of Residential Ventilation Units, Eurovent thus suggest the European Commission to:

- **Strengthen the mandatory information requirements concerning applied air filters.**
- **Set the reference filtration efficiency (filter class) for determination of the declared SEC factor.**
- **Require information on the filter by-pass leakage rate in the mandatory information request.**
- **Set focus on the filter media velocity and limit its permissible value.**

Background

The European Commission Regulation (EU) No 1253/2014 (Ventilation Units) states within Article 8 the review shall include an assessment of **"the appropriateness of taking into account the effects of low-energy consuming filters on the energy efficiency"**.

Eurovent Proposal in respect of Residential Ventilation Units (RVU)

1. Providing information on filtration efficiency (filter class) of applied filters on supply and exhaust side in the information request (Annex IV of the Regulation 1253/2014) and on the Energy Label accompanying a residential ventilation unit (Annex III of the Regulation 1254/2014)

Providing adequate IAQ is the fundamental function of ventilation systems. One of the main metrics of IAQ is the concentration of Particular Matter (PM). To keep acceptable PM concentrations indoors, the filters of correct filtration efficiency must be applied in a ventilation unit. The current lack of a requirement to report the efficiency of applied filters does not provide for correct comparison of various products and for assessment of their basic performance feature related to IAQ (indoor air quality) and energy consumption.

Moreover, when it comes to aftersales maintenance, efficient filters tend to be applied when a unit is placed on the market for the first time. After that, it is usually left to a building user to monitor the air filters installed in units and to replace them when considered necessary. This is the optimal scenario; the market reality often looks different in many EU Member States.

Given the high impact of an air filter on energy efficiency and indoor air quality, Eurovent thus strongly believes that the information requirements should be strengthened in order to guide users towards choosing the right replacement filter while replacing it at the right intervals.

Product information on the unit data sheet

ANNEX IV of the current Regulation in place states the information requirements for RVUs. This information should be expanded and additionally include:

- Filter classes (as they are of high IAQ relevance)
- Velocity to the filter media
- Clean pressure drops
- Recommendation on filter exchange intervals

Information requirements on the filter or the filter section

In addition, to provide an easy and instant access to requirements concerning replacement filters, Eurovent suggests introducing the following mandatory information on the filter section in a clear, visible form (e.g. label)

- Filter class,
- Type of filter

On changing the filter, the user can check this information.

2. Setting the reference filtration efficiency (filter class) of applied filters for determination of the Specific Energy Consumption (SEC) factor

To provide for consistent evaluation of a Ventilation Unit's energy efficiency, its basic function (provision of adequate IAQ) must be considered in the assessment. Thus, the reference requirements for filtration should be established. In the opinion of the Eurovent members, the Ecodesign requirements conformity assessment (testing) of the bidirectional and the unidirectional supply RVU should be carried out assuming that the configuration of a unit comprises ISO ePM1 50% filter on supply and ISO Coarse 60% filter on exhaust (always for bidirectional RVUs).

3. Providing information on the filter by-pass leakage rate in the information request (Annex IV of the Regulation 1253/2014)

The final effect of filtration is highly reliant on how airtight the assembling of a filter is. This performance is reflected by the filter by-pass leakage rate. The Eurovent members take the view that this performance should be included in the information request. Like this, end users will be informed what share of the fresh air stream supplied indoors is effectively filtrated, and what share just by-passes a filter.

At present, no test procedure for the filter bypass leakage is defined in the relevant EN standards. Nevertheless, in order to force improvement of sealings and limiting the bypass leakage, Eurovent suggests setting a requirement for performing at least a qualitative test method.

For this purpose, a simple so-called 'light test method' might be applied. The method is outlined in Annex A.1 of the Austrian standard ÖNORM H 6021 – Ventilation and air conditioning plants — Specifications keeping them clean and cleaning — National supplement to ÖNORM EN 15780, that states:

"In order to ensure and maintain the quality of the filter, a secure sealing between the filter element and the air filter frame on the one hand and the air-filter-frame and the inner section of the ventilation unit on the other hand must be established.

The sealing between the filter frame and the filter section inside the AHU must be checked by means of a "light test" (e.g. a hand lamp illuminates the clean side of the filter packs, no light should shimmer through on the unfiltered airside) …"

4. Setting focus on filter media velocity and limiting its maximum value

Based on a survey conducted within Eurovent among 110 manufacturers within our Product Group "Air Handling Units" and "Residential Air Handling Units", Eurovent holds that it is not sufficient to take into consideration only the clean pressure drops as in the current Regulation in place but to go further.

As a way to provide simple and consistent requirements to ensure the correct level of energy efficiency of filters, we propose additionally to take into account the complete surface of a filter, and to calculate the velocity in this area by applying the following formula:

Reference Air flow of the RVU in [m3/s] / Active area of the filter media in [m²]

Such an approach could lead to elimination of filters offering low pressure drop when clean, but next reaching quickly very high pressure.

The surface area must be provided by filter suppliers or, if not, can be easily measured. For market surveillance authorities, this would also be easily manageable.

Limit velocity on the filter media

Eurovent proposes to limit the velocity on the filter media for all filters inside the RVU – unit. We propose a limit of

- 0.2 m/s for ISO *e*PM1/*e*PM2.5/*e*PM10 filters
- 0.5 m/s for ISO coarse filters

(filters classes according to EN ISO 16890).

III. Eurovent Position 3 of 5: The appropriateness of introducing new requirements for RVUs concerning leakages

In a nutshell

Within this Position Paper, Eurovent suggests the European Commission to introduce new requirements for bidirectional RVUs in order to prevent problems caused by leakages. The reasons for this are outlined in the following Position Paper, where we propose:

1. **Setting requirements for the maximum internal leakage rate in bidirectional RVUs.**
2. **Correcting the declared thermal efficiency of the HRS depending on the internal leakage rate.**

Background

The European Commission Regulation (EU) No 1253/2014 (Ventilation Units) states within Article 8 that the review shall include an assessment of "the need to set requirements on air leakage rates".

Reasoning

Members of the Eurovent Product Group 'Residential Air Handling Units' take a clear position on the need for modification of the current Ecodesign requirements for RVUs in respect air leakage rates. The proposal aims at the improvement of energy efficiency of ventilation units by:

- Limiting consumption of electric energy by fans transporting redundant air due to internal leakage,
- Avoiding deterioration of the actual heat recovery performance due to internal leakage.

It should also be emphasised that besides energy aspects, air leakages have a negative impact on the provision of correct Indoor Air Quality (IAQ), which is the core function of ventilation systems.

Eurovent proposal

- Requirements for the maximum internal leakage rate in bidirectional RVUs should be set in the revised regulation: Based on the Eurovent member's expertise, currently applied technologies facilitate limiting the internal leakage rate to A2 class for ventilation units comprising recuperative HRS and to C3 class for ventilation units comprising regenerative HRS. Leakage classes and corresponding test method are defined in the upcoming harmonised EN 13141-7:2019

  At the same time, Eurovent members claim that internal leakage measurement methods (pressure for recuperative and tracer gas for regenerative HRS) considerably differ and their results are not comparable at all. Thus, we call the Commission to define a consistent method for testing the internal leakages both for the recuperative and the regenerative Heat Recovery Systems preferably based on pressure method considering internal pressure differences at reference airflow at reference external pressure applied. Only such an approach enables unambiguous consideration of internal leakages for the correction of SEC value and the temperature efficiency for both technologies.

- Declared thermal efficiency of the residential HRS, used to determine SEC factor, should be corrected depending on the internal leakage rate: The way how to calculate the correction should be based on the method proposed in the upcoming harmonised EN 13142:2019

IV. Eurovent Position 4 of 5: The need to consider the defrosting strategy in the calculation of the Specific Energy Consumption factor (SEC)

In a nutshell

With this Position Paper, Eurovent and its members provide the European Commission with a proposal to take account of the annual heating energy for residential bidirectional units with recuperative heat exchanger depending on the type of defrosting strategy.

Based on the Eurovent member's expertise, this feature has a significant impact on the effective energy consumption, that can considerably vary depending on applied technology especially in cold climate conditions.

Eurovent suggests the European Commission to extend the ecodesign declaration in respect of defrosting and to:

1. **Strengthen the mandatory information requirements concerning the applied defrosting strategy**
2. **Modify the SEC calculation model to better reflect the actual impact of applied defrosting strategy on energy consumption.**

Background

The European Commission Regulation (EU) No 1253/2014 (Ventilation Units) states within Article 8 the review shall include an assessment of **"the need to set a further tier with tightened ecodesign requirements".**

Eurovent Proposal in respect of Residential Ventilation Units (RVU)

1. Providing for RVUs with recuperative heat exchanger the obligatory description of applied defrosting strategy in the information requirements (Annex IV of the Regulation 1253/2014) and in the Product fiche (Annex IV of the Regulation 1254/2014)

The information requirements of the current Regulation differentiate only the type of heat recovery system (recuperative, regenerative, none) and do not address at all the technology for defrosting standing behind (in case of units with recuperative heat exchangers). In the opinion of Eurovent members, this is an overreaching simplification. In practice, there are numerous defrosting strategies available on the market. A Non-exhaustive list of possible measures includes

- Lowering the supply air flow rate
- Increasing exhaust air flow rate
- Bypass for defrosting
- Electric and hot water coil preheating
- Ground heat exchanger

Moreover, each of these strategies can be controlled in a simplified on/off mode or advanced modulating mode. Depending on the applied defrosting strategy and the control mode, the effective consumption of energy for defrosting - notably in cold climate – might considerably vary. Besides the energy issue, the indoor comfort in served spaces could be compromised when using the simplest defrosting strategy.

Not all available defrosting strategies secure undisturbed functioning of the ventilation system. Besides reducing energy consumption, the correct operation involves continuous and balanced air flows in any conditions and the acceptable limit for minimum supply air temperature. These features have a crucial impact on heat losses of modern, air-tight buildings (pressure balance) and hygienic aspects (condensation and mould problem inside/outside air ducts at too low supply temperature).

For these reasons, Eurovent suggest straightening the mandatory information requirements and to include a detailed description of the applied defrosting strategy in order to provide complete information to the end user and to eliminate from the market technologies which do not guarantee correct operation of the system during defrosting.

2. Modification of the SEC calculation model to better reflect the actual impact of applied defrosting strategy on energy consumption

Following the arguments set out in the previous paragraph, Eurovent suggests modifying in a simple and easy-to-adopt way the calculation of the Specific Energy Consumption factor (SEC) to consider the impact of defrosting strategy. The corrected SEC should regard the actually applied strategy (and not the best available in the VU control system). As a base for developing a consistent method for correcting SEC, the approach outlined in the Annex 'Calculation of an extended SEC' of the upcoming harmonised standard EN 13142:2019 might be used. This method, developed based on in-depth study of various defrosting strategy options, provides for feasible consideration of defrosting strategy impact on the energy efficiency of RVUs.

Eurovent members believe, that the appropriate consideration of the defrosting strategy effect will be a powerful driving force for eliminating non-effective technologies from the market.

V. Eurovent Position 5 of 5: The need for consideration of the actual working point in energy labelling, and a need for unification of the reference for declaration of sound power level and maximum flow rate displayed on the energy label in respect of ducted residential ventilation units

In a nutshell

With this Position Paper, Eurovent and its members provide the European Commission with a proposal to consider the impact of the actual working on the declared energy efficiency class, and to unify the reference for a declaration of data on the unit Energy label.
Eurovent suggests the European Commission to:

1. **Include in the documentation requirements information on SEC across the entire working range of the unit, OR**
2. **Modify the definition of nominal air flow rate for RVUs of the maximum flow rate higher than 250 m³/h and allow for the higher external pressure difference**
3. **Unify the reference point for a declaration of sound power level and maximum flow rate displayed on the energy label**

Background

The European Commission Regulation (EU) No 1253/2014 (Ventilation Units) states within Article 8 the review shall include an assessment of" the need to set a further tier with tightened ecodesign requirements".

Eurovent observations

The current Regulation 1254/2014 establishes energy labelling requirements and Regulation 1253/2014 sets minimum ecodesign requirements for residential ventilation units.
The mandatory product label displays the specific energy consumption SEC class referring to the SEC factor of a unit. Assumedly, the objective of the energy labelling for RVUs was to encourage end-users to purchase energy-efficient products, taking for grounded that professional planners do not participate in the selection of these products.

The SEC factor is calculated based on the Specific Power Input (SPI) for the reference air flow rate. For ducted units, the considered reference air flow rate corresponds to at least 70% of the maximum air flow rate and 50 Pa of external pressure difference. However, the Eurovent members hold that the performance of the ducted RVU always depend on the characteristic of ductwork the unit is installed in. Usually, the actual duty point (air flow – pressure) considerably differs from the ecodesing reference air flow point. Moreover, out of Eurovent members experience, the ventilation system design is oftentimes performed by professional HVAC planners (typical projects of single-family homes or project of the multi-family house) and a selection of RVUs in not left to customers (end-users).

Eurovent proposals on consideration of the actual working point

Taking into consideration the above, Eurovent claims that the product selection driven only by declared energy class does not always contribute to the optimal matching of a unit performance to the system, and frequently is just misleading (e.g. unit rated in 'A' class operates effectively in 'B' class zone or vice versa). A case study for justification of this standpoint is presented in the Appendix 1 of this position paper.

Eurovent acknowledges the positive impact of energy labelling on energy savings. However, given that system planners are also involved in product selections, we put forward for consideration two alternative proposals of additional measures providing for further improvements.

Eurovent proposal 1

The first Eurovent proposal is to extend the information on SEC (or similar SEC-related) value across the entire working range of the unit, instead of focusing on the reference flow rate only. This information would be addressed to system planers who know the actual working point of the unit and could select a more energy-efficient product.

Thus, Eurovent suggests including in the information requirements for the documentation provided with the product (Annex IV or Regulation 1253/2014 and Annex IV or Regulation 1254/2014) a tabular or graphical collation of SEC value across the product working range (tentative proposals for presentation of this information are included in the Appendix).

Eurovent proposal 2

If the former proposal could not be accepted, the alternative Eurovent proposal is to modify the definition of the nominal air flow rate for VUs of the maximum flow rate between 250 m^3/h and 1000 m^3/h and declared by the manufacturer as intended for exclusive use in a residential ventilation application.

The Eurovent member's expertise shows that for RVUs operating at a flow rate above 250 m^3/h, the corresponding external pressure difference generally exceeds 50 Pa and, in most cases, amounts to much higher values (typically 150 Pa). This means, the SEC evaluation referring to 50 Pa might be not accurate and misleading for larger Residential Ventilation Units.

Thus, we propose introduction in the revised regulation of an additional model for calculation of SEC (referring to higher than 50 Pa external pressure difference) for RVUs of maximum airflow rate exceeding a certain value (most preferably 250 m^3/h)

Eurovent proposals on the unification of the reference point for information declared on the unit label

As per current Regulation 1254/2014, the energy label includes information on the sound power level (L_{WA}) and the maximum flow rate. However, the sound power level refers the reference air flow rate and not the maximum flow rate, which is not clearly stated on the label. Eurovent members hold, this way of presenting data might be highly confusing to the end user and propose to unify the reference point for these two values.

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 amount of votes?
At Eurovent, the number of votes is never related to organisation sizes, country sizes, or membership fee levels. No matter if SMEs or large organisations, each company receives one vote within our technical working groups. In our General Assembly or Eurovent Commission ('steering committee'), our national member associations receive two votes per country.

2. Who has the final decision-making power?
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?
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.

4. How representative is the organisation?
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, the Middle East and Africa 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 Euros, 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 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.

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Appendix 1
to Eurovent consolidated Position Paper concerning Revision of Commission Regulation (EU) No 1253/2014 and Commission Delegated Regulation (EU) No 1254/2014

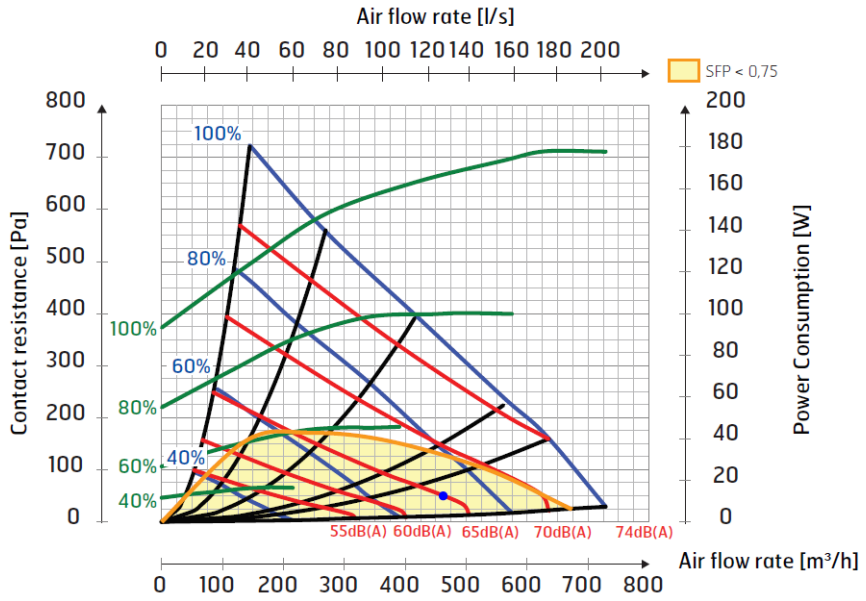
Related to Positon 5
The need for consideration of the actual working point in energy labelling

SEC Value for the customer -Energy label

REASON FOR AN ALTERNATIVE

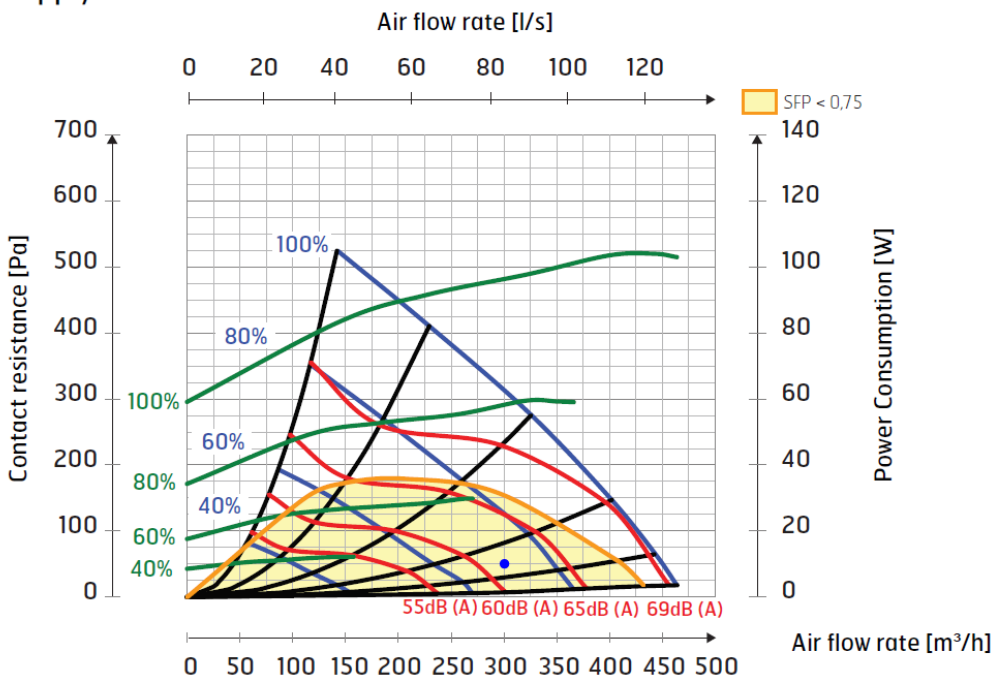
Comparison of units with different Max

Supply air side



Ctrl 0,95 on both, same x value

Supply air side

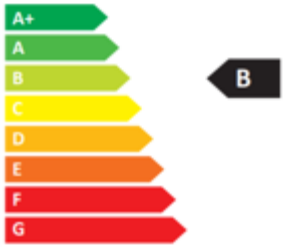


Ventilation unit 1

Max airflowrate at 100Pa is **680m³/h**

Reference point is 470m³/h at 50Pa
This is the point all ECO Design data is presented.

SEC Value -33,8

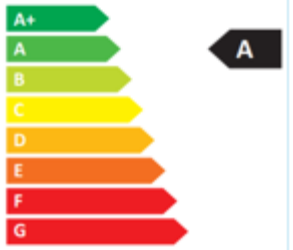


Ventilation unit 2

Max airflowrate at 100Pa is **428m³/h**

Reference point is 300m³/h at 50Pa
This is the point all ECO Design data is presented.

SEC Value -35,4



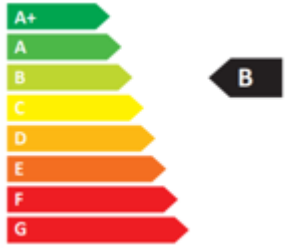
The customer look at the label

- The natural thing would be to choose the Unit with the best label.
  In this case Unit 2.

  This Unit 2 present an class A and SEC value of -35,4

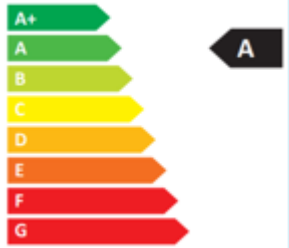
  but remember this is only in the Reference point!

Unit 1
SEC Value
-33,8



46dB(A)

Unit 2
SEC Value
-35,4

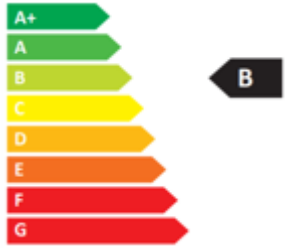


42dB(A)

We may say that the Unit with the higher Max air flow rate being punished in the way we choose the workingpoint at 70%,
both SEC class and Sound level is better for the Unit 2 in reference point.

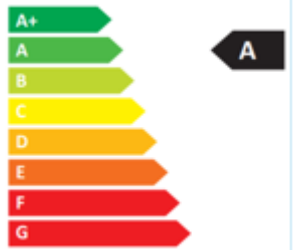
The aim is to use the Unit at a workingpoint 350m³/h at 50Pa

560	B	-31,6
550		-32,0
540		-32,3
530		-32,52
520		-32,6
510		-32,8
500		-33,1
490		-33,3
480		-33,6
470		-33,8
460		-34,0
450	A	-34,2
440		-34,4
430		-34,7
420		-34,9
410		-35,0
400		-35,0
390		-35,3
380		-35,5
370		-35,8
360		-35,9
350		-36,0
340		-36,3
330		-36,2
320		-36,4
310		-36,6
300		-36,8
290		-36,8
280		-36,7



The A labeled unit becomes a B!

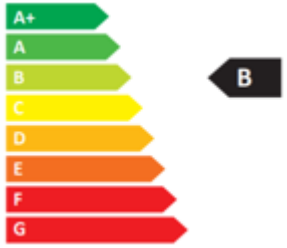
And the B labeled unit becomes an A!



440	B	-30,0
430		-30,4
420		-30,8
410		-31,1
400		-31,4
390		-32,0
380		-32,2
370		-32,3
360		-32,7
350		-33,2
340		-33,6
330	A	-34,1
320		-34,7
310		-35,1
300		-35,4
290		-35,7
280		-36,1
270		-36,4
260		-36,6
250		-36,8
240		-36,9
230		-37,2
220		-37,4
210		-37,4
200		-37,4
190		-37,5
180		-37,5
170		-37,6
160		-37,6

If we change the workingpoint to 350m³/h at 70Pa (more normal house)

560	B	-31,6
550		-32,0
540		-32,3
530		-32,52
520		-32,6
510		-32,8
500		-33,1
490		-33,3
480		-33,6
470		-33,8
460		-34,0
450	A	-34,2
440		-34,4
430		-34,7
420		-34,9
410		-35,0
400		-35,0
390		-35,3
380		-35,5
370		-35,8
360		-35,9
350		-36,0
340		-36,3
330		-36,2
320		-36,4
310		-36,6
300		-36,8
290		-36,8
280		-36,7



The SEC value : -34,8
But gives an A
the opposite of the label

The SEC value : -33,7
But gives an B
the opposite of the label

440	B	-30,0
430		-30,4
420		-30,8
410		-31,1
400		-31,4
390		-32,0
380		-32,2
370		-32,3
360		-32,7
350		-33,2
340		-33,6
330	A	-34,1
320		-34,7
310		-35,1
300		-35,4
290		-35,7
280		-36,1
270		-36,4
260		-36,6
250		-36,8
240		-36,9
230		-37,2
220		-37,4
210		-37,4
200		-37,4
190		-37,5
180		-37,5
170		-37,6
160		-37,6

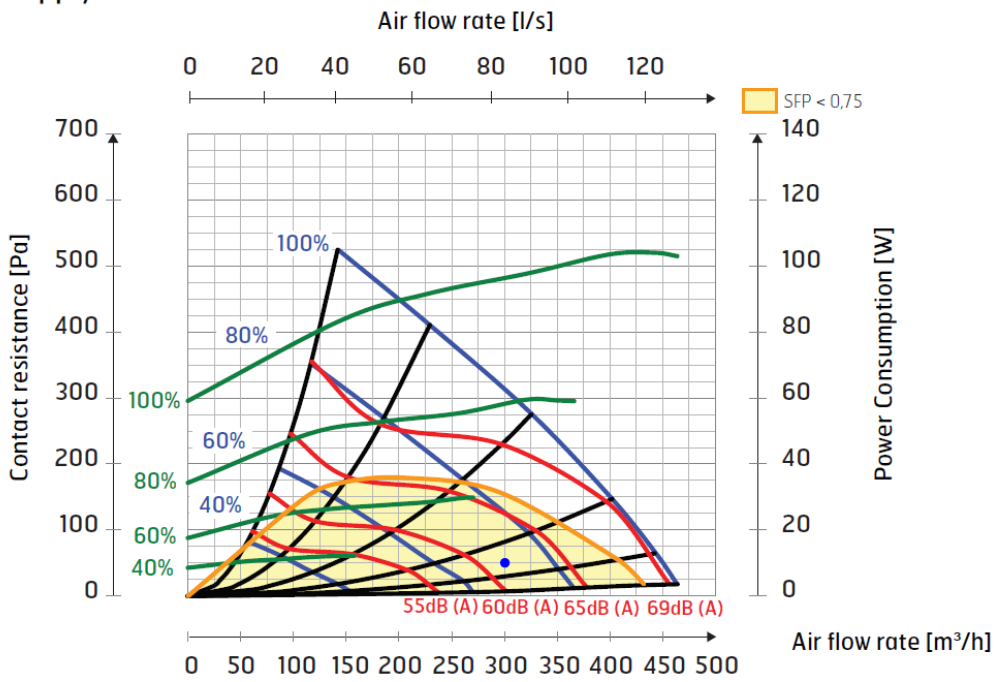
This means that the label give the customer ''false'' advise.
This happens when you compare a unit with wide flow rate range with a unit with narrow flow rate range

What can we do to provide enough information for the customer ?

SUGGESTION OF AN ALTERNATIVE

Add to the documentation

Supply air side



Today we already measure how much effect the fan uses for the different fan-power adjustments/pressure.

And we do this according to 1253 at minimum 3 different levels (minimum/normal/max)

So the suggestion would be:

-Make a table with flowrate and SPI for 3 different pressure 50,100,150Pa

or only the one pressure 100Pa to give a scale of SEC value

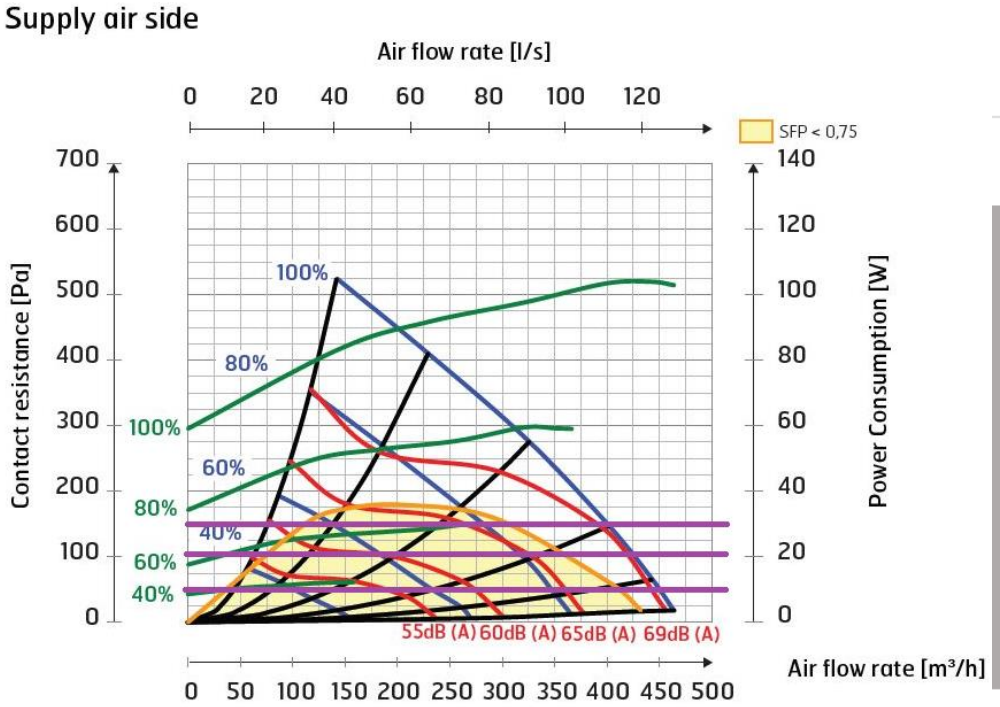
Air flow rate m³/h	SPI kW/(m³/h)
300	0,000358
290	0,000350
280	0,000350
270	0,000339
260	0,000339
250	0,000333
240	0,000328
230	0,000322
220	0,000317

A scale with SEC value in the documentation

- This can mean that you have a scale of SEC value in your documentation as an addition to the label

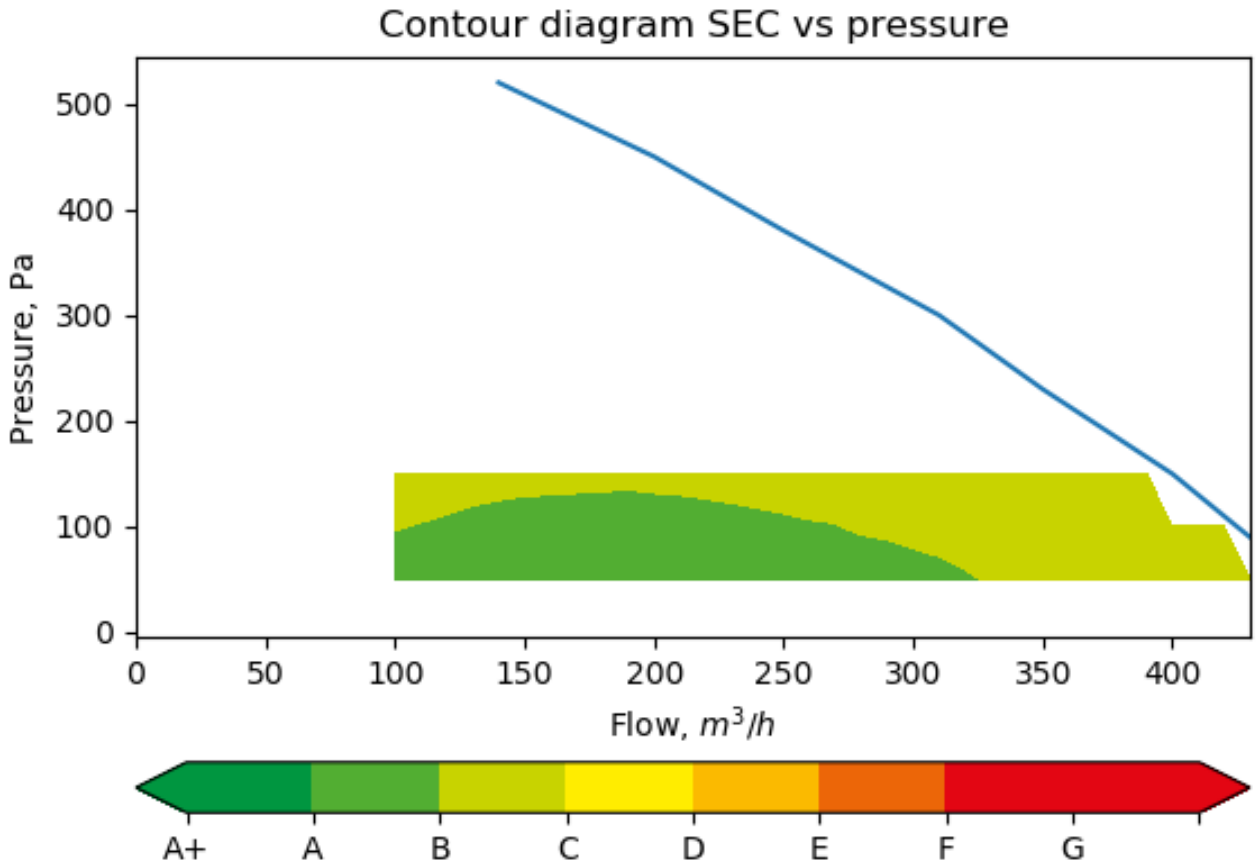
- The data you need is SPI value for different Pressure.
  For units that do not reach 100Pa

  A scale at 50Pa is enough!



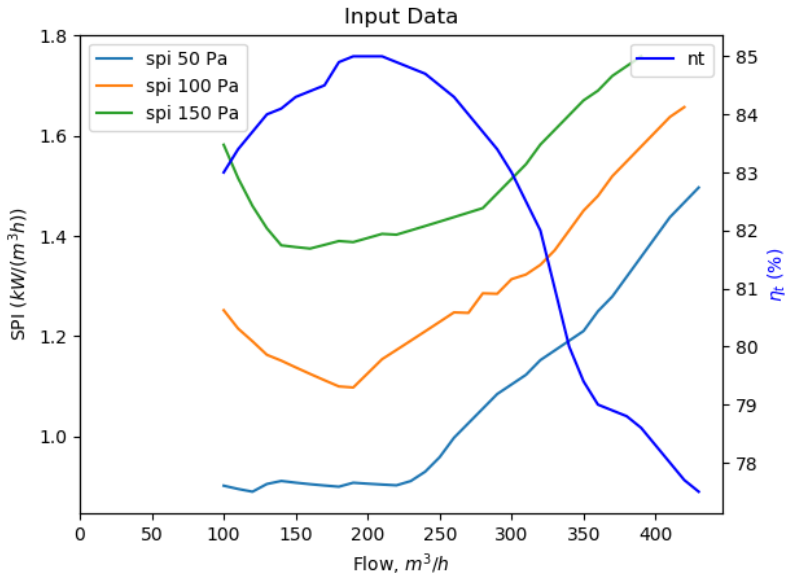
	50Pa	100Pa	150Pa
Air flow rate m³/h	SPI kW/(m³/h)	SPI kW/(m³/h)	SPI kW/(m³/h)
300	0,00031	0,00037	0,00042
290	0,00030	0,00036	0,00041
280	0,00029	0,00036	0,00040
270	0,00029	0,00035	0,00040
260	0,00028	0,00035	0,00040
250	0,00027	0,00034	0,00040
240	0,00026	0,00034	0,00039
230	0,00025	0,00033	0,00039
220	0,00025	0,00033	0,00039
210	0,00025	0,00032	0,00039
200	0,00025	0,00031	0,00039

Example how this could look like



Here you can choose your working point!

Input - Result



Flow	SEC 50 Pa	SEC 100 Pa	SEC 150 Pa
100	-36.6 A	-33.8 B	-31.1 B
110	-36.8 A	-34.2 A	-31.8 B
120	-36.9 A	-34.5 A	-32.3 B
130	-36.9 A	-34.8 A	-32.8 B
140	-36.9 A	-34.9 A	-33.1 B
150	-36.9 A	-35.1 A	-33.2 B
160	-37.0 A	-35.2 A	-33.2 B
170	-37.0 A	-35.4 A	-33.2 B
180	-37.2 A	-35.6 A	-33.2 B
190	-37.2 A	-35.6 A	-33.3 B
200	-37.2 A	-35.4 A	-33.2 B
210	-37.2 A	-35.2 A	-33.2 B
220	-37.2 A	-35.0 A	-33.1 B
230	-37.1 A	-34.8 A	-33.0 B
240	-36.9 A	-34.6 A	-32.9 B
250	-36.6 A	-34.4 A	-32.8 B
260	-36.2 A	-34.2 A	-32.7 B
270	-35.9 A	-34.1 A	-32.5 B
280	-35.6 A	-33.7 B	-32.3 B
290	-35.2 A	-33.6 B	-32.0 B
300	-35.0 A	-33.3 B	-31.7 B
310	-34.7 A	-33.1 B	-31.3 B
320	-34.3 A	-32.7 B	-30.8 B
330	-33.8 B	-32.2 B	-30.3 B
340	-33.4 B	-31.6 B	-29.7 B
350	-33.0 B	-31.1 B	-29.3 B
360	-32.6 B	-30.7 B	-29.0 B