Comments on **Explanatory note on internal Specific Fan Power**

By Wolf GmbH Mainburg Germany, Member of EVIA

Note: Original text from explanatory note in blue, below our comment

Question 5:
Is the nominal airflow the maximum airflow of the NRVU?
Below input from Eurovent Certification Company (ECC) for information
'The "nominal flow rate" cannot be higher than the highest airflow at which the "thermal efficiency of a non-residential HRS (ηt_nrvu)" is fulfilled at equal s, supply and extract'.
*'A NVRU is normally designed for one specific working point but when Variable Air Volume flow system or Demand Controlled Ventilation are used there will be a range of working points from a minimum airflow up to a maximum. The "nominal flow rate" shall in such case be the design working point **winter time** when heat recovery is fully used. The design working point summer time can be at a higher airflow but will only be used a short period during the year and may not fulfil the requirements in this Regulation'.*

Answer
The nominal airflow and pressure must be seen as the maximum airflow of the NRVU in the sale of which the NRVU can fulfil the requirements according to the definitions in the regulation:
Definition of nominal flow rate in the regulation:
'Nominal flow rate (qnom)' (expressed in m3/s) means the declared design flow rate of an NRVU at standard air conditions 20 °C and 101 325 Pa, whereby the unit is installed complete (for example, including filters) and according to the manufacturer instructions.
The design point is usually the maximum conditions the VU must meet according to demands from the contractor.
Justification
Mostly the same point is used for summertime and wintertime, and this interpretation will provide a huge loophole and can therefore not be used.
In winter, ventilation demands are mostly due to the atmospheric indoor climate, and in the summer due to the thermal indoor climate. The airflow demand for atmospheric indoor climate (winter) is often lower than the thermal (summer) because of the cooling demand in summer. However, in winter there is also often the demand for heat, which increases the airflow. Likewise, in summer, there is often a demand for cooling recovery, when the air outside has a higher temperature than the air inside the building, which increases the airflow over the HRS and does not make it lower than in the winter.

Our proposal:

Concerning the nominal airflow, there must be a differentiation between “tailor-made NRVU” and “mass-produced standardized compact NRVU”.

Justification:

Every tailor-made NRVU is based on an individual selection with an individual airflow. In this case the airflow is always known to the manufacturer and must be the basis for calculating SFP_{int} and thermal efficiency of HRS.

Using a higher airflow (maximum which the NRVU can fulfill the requirements) would create a very theoretical calculation method, that leads to confusion.

Example: Customer demands airflow of 20.000 m³/h, but SFP_{int} is calculated for 24.000 m³/h, this makes no sense at all and would cause a huge and useless iteration calculation effort.

Mass-produced standardized compact NRVU: Here the answer is ok, because no individual selection is made.

The nominal airflow and pressure must be seen as the maximum airflow of the NRVU in the sale of which the NRVU can fulfil the requirements according to the definitions in the regulation (…)

Question (claim) 6

What is the nominal airflow when using a mixing section?

Below input from* Eurovent Certification Company (ECC) *for information

'When a mixing section is installed, HRS and filter are selected for outdoor air demand only and in some cases they are not able to handle the full design flow rate of the unit – calculate the internal pressure losses of the ventilation components (HRS+filter) for the design airflow. If they are designed only for the outdoor air and not for the total airflow, calculate only the outdoor air part. Fan characteristics, system losses, fan efficiency etc. shall be calculated with the total airflow through the fan'.

Answer

Measurements and declaration must be performed as a 'normal' unit with a heat recovery system, not recirculating.

Our proposal:

This question should be answered in a clearer way.

Example: A NRVU with a mixing section: 15.000 m³/h outdoor air, 10.000 m³/h recirculation air. The fan selection is done for 25.000 m³/h. Needs the calculation for SFP_{int} to be done for 15.000 m³/h or for 25.000 m³/h?

Question 8

*Is the 'internal pressure drop of **additional non-ventilation components** (Δps,add)' (expressed in Pa) with or without the NRVU inlet and outlet losses if applicable?*

Answer

The inlet and outlet is a part of the casing and therefore not part of the '**non-**ventilation components.

The NRVU inlet and outlet losses must be included in the **'**The internal pressure drop of ventilation components (Δps,int)'

If a ducted air-handling unit has full size openings (the internal cross section of the duct systems is equal to the cross section of the NRVU), it mostly experiences no additional pressure losses at the inlet and outlet opening.

Our proposal:

NRVU inlet and outlet losses must be part of additional non-ventilation components (Δps,add) and consequently are **not included in Δps,int.**

Justification

Inlet and outlet losses are always a result of a reduction of the cross section from the VU to the duct, e.g. for an additional transition piece from square to round section. Manufacturers of VU are not responsible and have no influence for the cross section of ducts. Including the losses to Δps,int is not consequent, otherwise external pressure could be added as well.

Otherwise for mass-produced standardized compact NRVU a big amount of different technical data for the same type of VU must be provided. That would create confusion to the customers.

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