26.6.2015

Finnish Association of Building Services Industries (FABSI) is the Finnish cooperation organisation for industrial, economic and environmental issues within the mechanical building services industries. It was founded at the beginning of 2004, following the merger of the Association of Finnish Manufacturers of Air Handling Equipment (AFMAHE) and the Council of HPAC Industries (LTN). All members of both associations joined the new FABSI. Today the association has 39 member companies.

# FABSI's Comments and questions on Regulation (EU) No.1253/2014 & 1254/2014

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*Article 1*

**Subject matter and scope**

1. This Regulation applies to ventilation units and establishes ecodesign requirements for their placing on the market or putting into service.

Question:
Who is responsible for CE-marking?
"putting into service", who is responsible of the system which consists of different components from different manufactures?
• HVAC-contractor, who has bought different components direct from the store or manufacturer. →contractor is responsible for the final system?
• If all the components are sold together as a system →supplier or manufacturer is responsible
• Role of the HVAC- designer? The system has to be designed in such way that it meets ecodesign requirements.

*Article 2*

**Definitions**

For the purposes of this Regulation the following definitions shall apply:

(2) 'residential ventilation unit' (RVU) means a ventilation unit where:

(a) the maximum flow rate does not exceed 250 $m^3/h$;

(b) the maximum flow rate is between 250 and 1 000 $m^3/h$, and the manufacturer declares its intended use as being exclusively for a residential ventilation application;

Comment:

It is hard to prove that the unit can not be used in other places than in residential buildings. In our selection we have many ventilation units that are used in residential buildings and also in other buildings. We can not control that the ventilation units are sold only to residential buildings.

We don´t support the idea that a unit should fulfill both RVU and NRVU regulations. Therefore it should not be forbidden to use RVU´s in other places than residential buildings

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(4) ‘maximum flow rate’ is the declared maximum air volume flow rate of a ventilation unit that can be achieved with integrated or separately co-supplied controls at standard air conditions (20 °C) and 101 325 Pa, where the unit is installed complete (e.g. including clean filters) and according to the manufacturer's instructions, for ducted RVUs the maximum flow is related to the air flow at 100 Pa of external static pressure difference, and for non-ducted RVUs to the air flow at the lowest achievable total pressure difference to be chosen from a set of values of 10 (minimum)-20-50-100-150-200-250 Pa, whichever is equal or just below the measured pressure difference value;

Q:
NRVU: nominal flow rate means the declared design flow rate, which is lower or equal to the maximum flow rate. Is this correct?”

## ANNEX I

## Definitions

Definitions applicable for the purposes of Annexes II to IX to this Regulation:

1.

(3) ‘multi-speed drive’ means a fan motor that can be operated at three or more fixed speeds plus zero (‘off’);

Q: To switch the ventilation unit off, is the maintenance switch or equal enough?

Comment:
The maintenance switch off or equal should be adequate. The regulation sets, that a ventilation unit should have a "zero position". In most of the cases the unit does not have it. In our opinion a door switch, maintenance switch or a circuit breaker, which is carefully tagged is

adequate.

(7) 'internal leakage rate' means the fraction of extract air present in the supply air of ventilation units with HRS as a result of leakage between extract and supply airflows inside the casing when the unit is operated at reference air volume flow, measured at the ducts; the test shall be performed for RVUs at 100 Pa, and for NRVUs at 250 Pa;

Q: Is this for all types of HRS? Standards EN308 ja 13141-7 defines internal leakage rate.

(8) 'carry over' means the percentage of the exhaust air which is returned to the supply air for a regenerative heat exchanger according to the reference flow;

Q: How this is measured? Difference between carry over and leakage.

Comment: If internal leakage rate has been measured by pressure test, it is not necessary to measure carry over.

(12) 'effective power input' (expressed in W) means the electric power input at reference flow rate and corresponding external total pressure difference and includes the electrical demand for fans, controls (including remote controls) and the heat pump (if integrated);

Q: Does this mean same power than measured from plug?

(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;

Q: Are two similar sensors ok? They should be ok.

2. **Definitions for NRVU, in addition to the definitions in Annex I Part 1:**

(8) 'maximum rated fan speed ($v_{fan\_rated}$)' (expressed in rounds per minute — rpm) is the fan speed at nominal flow rate and nominal external pressure;

Q: Where this value (vfan_rated) is needed?

(11) 'thermal efficiency of a non-residential HRS ($\eta_{t\_nrvu}$)' 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;

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Comment and suggestion:

Calculation of thermal efficiency for non-residential heat recovery units with unbalanced supply and exhaust air volume flow rates:

In the case of centralised heat recovery devices (rotating wheel, plate heat exchangers etc.), we suggest that thermal efficiency shall be calculated for both air volume flows equal to the supply air volume flow – as also suggested by Eurovent.

In case of run around heat recovery systems, we suggest that a the thermal efficiency is calculated by following equation:

$$\varepsilon_{balanced} = \frac{1+R}{2} * \varepsilon_{unbalanced}$$

where,

$\varepsilon_{unbalanced}$ is the thermal efficiency calculated for actual coils with real air supply and exhaust air flow rates.

$$R = \frac{\dot{C}_{supply}}{\dot{C}_{exhaust}}$$

$$\dot{C} = \dot{V}_{air} * \rho_{air} * c_p$$

$\dot{V}_{air}$ is the volume flow rate of air [$m^3/s$]

$\rho_{air}$ is the density of air [$kg/m^3$]

$c_{pi}$ is the specific heat capacity of air in constant pressure, 1,006 kJ/kgK

When supply air temperature is +5 C, value 1,26 $kg/m^3$ can be used for supply air.

When exhaust air temperature is +25 C, value 1,18 $kg/m^3$ can be used for exhaust air.

$\dot{C}_{supply} = \dot{V}_{supply} * \rho_{supply} * c_{pi}$ is the heat capacity flow rate of supply air, W/K

$\dot{V}_{supply}$ is the volume flow rate of supply air [$m^3/s$]

$\rho_{supply}$ is the density of supply air [$kg/m^3$]

$c_{pi}$ is the specific heat capacity of air in constant pressure,

1,006 kJ/kgK

$\dot{C}_{exhaust} = \dot{V}_{exhaust} * \rho_{exhaust} * c_{pi}$ is the heat capacity flow rate of exhaust air, W/K

$\dot{V}_{exhaust}$ is the volume flow rate of exhaust air [$m^3/s$]

$\rho_{exhaust}$ is the density of exhaust air [$kg/m^3$]

$c_{pi}$ is the specific heat capacity of air in constant pressure, 1,006 kJ/kgK

Thermal efficiency of run around heat recovery system shall be declared by using the actual brine that is used in the project. However, if the actual brine used in the project has heat transfer properties that are inferior to ethylene glycol (concentration 25% by volume), then 25% ethylene glycol shall be used as a brine when calculating the thermal efficiency.

A statement is needed for the definition of thermal efficiency in hybrid systems, where heat recovery from some other thermal energy source (ground, solar etc) or primary heating is integrated in a run around heat recovery system.

(12) 'internal specific fan power of ventilation components ($SFP_{int}$)' (expressed in W/($m^3/s$)) is the ratio between the internal pressure drop of ventilation components and the fan efficiency, determined for the reference configuration;

Comment:

We support Eurovent's comment (Eurovent Product Group 'Air Handling Units', Position Paper, PP — 2014-04-27) with an addition:

If a frequency changer is an individual component, the efficiency of the power transmission should be announced. The example value for calculations could be 0,97.

## ANNEX V

## Information requirements for NRVUs as referred to in Article 4(2)

1. From 1 January 2016, the following product information shall be provided:

(h) effective electric power input (kW);

Question:

Does this mean actual power input for the reference configuration, or for the actual delivered configuration, or does it mean the nominal power stated by the fan motor manufacturer?

If it is for the reference configuration, should it be calculated with the ηe or the nominal

Air flow and external pressure drop?

Is this given separately for the supply and exhaust fans or only one value for the AHU?

(p) energy performance, preferably energy classification, of the filters (declared information about the calculated annual energy consumption);

Comment:

The definition of energy classification of the filter is undefined. Also the method how to calculate the annual energy consumption of the filter is undefined in the document. The calculation method for the annual energy consumption should apply to the filtering function (eg a set up of filters), not just one filter module.

2. The information listed in point 1(a) to (s) shall be available:

— in the technical documentation of NRVUs; and

— on free access websites of manufacturers, their authorised representatives, and importers.

Comment:

Non-residential ventilation units (NRVU) are typically selected and calculated for each project. Annex V data is available only in the air handling unit manufacturer's calculation program. It is impossible to calculate all the variations in advance and put each data to manufacturers websites. Should the manufacturer make calculations of example units and put their data to free access websites?