

# The new Eurovent energy efficiency label for central ventilation units

The energy efficiency requirements for air handling units are increasing. Apart from the increased customer needs, legal energy efficiency requirements regarding central ventilation units have tightened too. According to the Ecodesign Directive for ventilation units (EU) No 1253/2014, new minimum energy efficiency requirements shall apply from January 2016.

The purpose of an energy label is to indicate to customers or users the energy quality of a product in order to help them with their purchase decision. The Eurovent Energy Efficiency Labelling for central ventilation units has become firmly established in Europe. After using the former Eurovent Energy Label /1/ for a six-year period, the new legal minimum energy efficiency requirements with regard to these products make an update of the energy labelling imperative. Moreover, the requirements of the Ecodesign Directive have been incorporated in the new Eurovent Certification and the energy classifications. The new energy efficiency classes apply from January 2016. Furthermore, a new Eurovent energy efficiency class A+ is being introduced, characterising devices with the currently highest available energy efficiency level. In the lower efficiency range, the classes “C” and “D” correspond roughly to the legal minimum requirements for ventilation units.

In general, the Eurovent calculation process for the definition of the energy label has not undergone significant changes. The criteria for the calculation of the energy label are still the thermal efficiency and the pressure drop of heat recovery, the air speed in the cross-section area of the ventilation unit as well as the efficiency of the fans in their operating points. The possibility of compensation between the individual requirements as well as the consideration of different climate zones remained unchanged. Changes have been implemented



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regarding the energy requirements for the achievement of efficiency classes as demonstrated in **Table 1**.

**Table 1.** Criteria for the definition of the Eurovent energy label classes for air handling units.

Class	max. air speed (m/s)	min. efficiency HRV (%)	max. pressure drop HRV per airway (Pa)	min. efficiency level ventilator $NG_{ref}$
A+	1.4	83	250	64
A	1.6	78	230	62
B	1.8	73	210	60
C	2.0	68	190	57
D	2.2	63	170	52
E	–	–	–	–

For ventilation units of the highest efficiency class “A+” ambitious criteria apply. It should be noted here that the required temperature efficiency of at least 83% can no longer be described in economic terms with all available heat recovery processes. While it can be realised with rotary heat exchangers and reverse flow exchangers (only in the lower air flow range), these values cannot be depicted economically with the heat transfer systems and cross-flow plate heat exchangers with the available technology today.

**Table 2.** Simulated operating costs for air handling units of the same performance from different energy efficiency classes.

Costs	Efficiency class according to Eurovent					
	A+	A	B	C	D	
Eta-HRV	83%	78%	73%	68%	63%	(--)
PM <sub>V,ZUL</sub>	6.98	7.21	7.44	7.83	8.56	(kW)
PM <sub>V,ABL</sub>	6.04	6.23	6.43	6.76	7.4	(kW)
Electricity	30 834	31 829	32 847	34 552	37 796	(€)
Cooling	4 606	4 698	4 697	4 877	5 216	(€)
Heating	1 879	5 153	8 383	11 491	14 325	(€)
<b>Total</b>	<b>37 320</b>	<b>41 660</b>	<b>45 927</b>	<b>50 920</b>	<b>57 337</b>	<b>(€)</b>
<b>Saving</b>	<b>35%</b>	<b>27%</b>	<b>20%</b>	<b>11%</b>		

The legal minimum efficiency for ventilation units from 2016, equipped with a heat recovery system (HRE > 63%) corresponds approximately to class “D”. Appliances which feature a plate or rotary heat exchanger according to the Ecodesign Directive (HRE > 67%) correspond approximately to class “C”. The provision for complying with the legal minimum Ecodesign requirements is also reviewed by Eurovent during the annual recertification process.

How can the best way to use an energy label be established for customers or users? The presentation of the energy and eventually economic differences between appliances in single efficiency classes demands a comparison of the life cycle costs, i.e. the calculation of the total operating costs of an air handling unit over a time period of e.g. 5 years. **Table 2** shows results of such calculations for air handling units of different energy efficiency classes. All appliances have an air supply performance of 14,500 m<sup>3</sup>/h and operate 5 days a week, 12 h daily (supply air winter = 22 °C, supply air summer = 18 °C). Electricity and thermal energy costs were estimated as follows: Electricity 13 cent/kWh, Heating 0.065 cent/kWh, Cooling 0.040 cent/kWh. The qualities of heat recovery and air supply were changed in air handling units.

**Table 2** shows that approximately 10% of the operating costs can be saved for air handling units per better energy class. This means that when an appliance belonging to energy class A is used instead of one belonging to class C, around 20% of energy costs are saved. However, this



Eurovent energy label class A+ (2016).

statement cannot be generalized as the sample calculation applies only to standardized operating hours and defined energy costs. An assessment of profitability requires that investment costs be included too in order to arrive eventually at the right purchase decision. ■