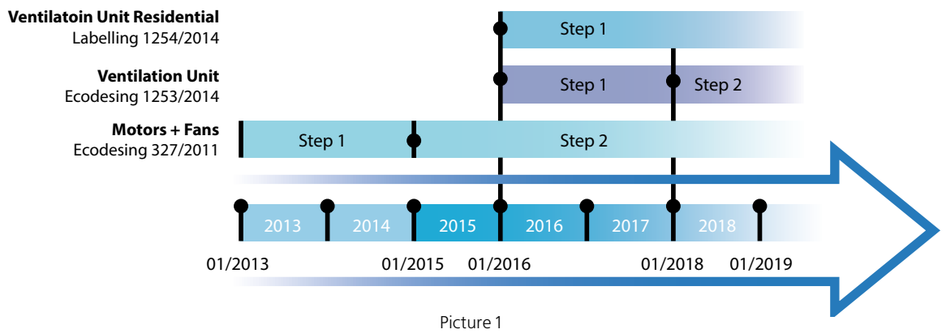
ECODESIGN & VENTILATION: BASIC COURSE

08/2016

Ecodesign & Ventilation: basic course

The European **ErP–Directive 2009/125/EC** (ErP – Energy related Products) or EcoDesign prescribes minimum requirements for energy efficiency and emissions for some categories of energy-using products placed on the market within the European Economic Area (EEA). Its goal is to reduce energy consumption (20%) and the CO_2-emission rates (20%) by the gradual improvements.

It is the basis for further Regulations for ventilation industry (See Picture 1).

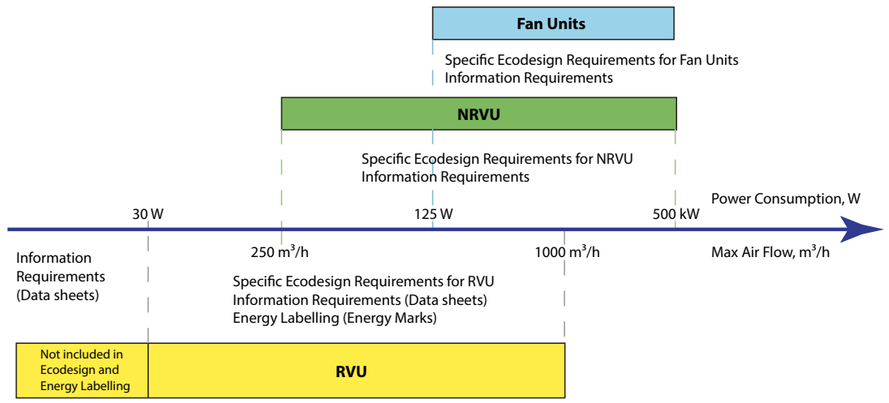


Picture 1

Regulation (EU) No 327/2011 (30 March, 2011) establishes EcoDesign requirements for fans, including those integrated in other energy-related products placed on the market or put into service as covered by Directive 2009/125/EC.
A fan within the scope of this Regulation is designed for use with or equipped with an electrical motor having an electrical input power between 125 W and 500 kW (> 125 W and < 500 kW) to drive the impeller at its optimum energy efficiency point.
Different minimum efficiency grades are specified and applied on 1 January, 2013 (Step1) and 1 January, 2015 (Step 2) (Picture 1).

As the EcoDesign progress, **Regulation (EU) No 1253/2014** concerning Ventilation Units (VU) was adopted on 26 November, 2014.
It provides 2 types of Ventilation Units: Residential (RVU) and Non-Residential (NRVU) (see Picture 2) and establishes specific mandatory EcoDesign requirements for Ventilation Units in order to place them on EEA market: Step 1 - starts 1 January, 2016, Step 2 – 1 January, 2018 (Picture 1).

Regulation (EU) No 1254/2014 (11 July, 2014) establishes requirements for the labelling and the provision of supplementary product information on Residential Ventilation Units (RVUs) and started applying on 1 January, 2016 (see Picture 1).



Picture 2

These regulations differentiate three main categories:
Fan units with electrical power consumption > 125 W and < 500 kW;
Residential Ventilation Units (RVU):
- Electrical power consumption > 30 W;
- Airflow ≤ 250 m³/h;
- Airflow between 250 and 1000 m³/h additionally declared as RVU.

Non-Residential Ventilation Units (NRVU):
- Electrical power consumption > 30 W;
- Airflow > 1000 m³/h;
- Airflow between 250 and 1000 m³/h additionally declared as NRVU.

The classifications make distinctions between unidirectional and bidirectional ventilation units:
- Unidirectional ventilation units (UVU) produce an airflow in only one direction;
- Bidirectional units (BVU) produce airflows between indoor and outdoor spaces in both two directions.

Machine manufacturers, distributors and installers cannot provide the European market with non-compliant units

The regulations make no distinction whatsoever between ventilation unit that will be used in new buildings or instead will replace existing units.
The main purpose is to reduce the energy consumption of ventilation systems significantly with no regard to their usage.

What should you know about efficiency requirements?

Case No.1: No efficiency characteristics requirements.
Special fans and ventilation units:
- ATEX Directive (explosive atmospheres);
- for volatile environments;
- for emergency use;
- with air temperatures > 100 °C and < -40 °C, or operating motor temperatures > 65 °C;
- with supply voltages > 1000 V AC or 1500 V DC;
- for toxic, highly corrosive, flammable or highly abrasive environments;
- that include heat exchangers and heat pumps or other heat transfers in addition to heat recovery;
- that are kitchen appliance hoods.

Case No.2: No efficiency characterictics requirements:
Fans and ventilation units P ≤ 30 W per air stream.
Case No.3: Units must comply with efficiency characteristics requirements:
Fans and ventilation units P > 30 W per air stream.

What should you know about information requirements?

	Power consumption	RVU		NRVU
		Energy Label	Data sheet	Data sheet
ATEX Directive (explosive atmospheres) for volatile environments; for emergency use; with air temperatures > 100 °C and < -40 °C, or operating motor temperatures > 65 °C; with supply voltages > 1000 V AC or 1500 V DC; for toxic, highly corrosive, flammable or highly abrasive environments; that include heat exchangers and heat pumps or other heat transfers in addition to heat recovery; that are kitchen appliance hoods.	Any level	–	–	–
Other fans and ventilation units are the subject of information requirements.	≤ 30 W UVU	–	RVU data sheet	–
	≤ 30 W BVU	+		–
	> 30 W UVU BVU	+		NRVU data sheet

Ecodesign EU-directive 1253/2014 requirements for Non-Residential Ventilation Units

All ventilation units, except fans with more than one range of application (for example fans used for both ventilation and combustion gas extraction) shall be equipped with a multispeed or a variable speed controller.

VU type		Efficiency characteristic	Relation	Objective characteristics	
				Erp 2016	Erp 2018
Fans & UVUs without air treatment	P ≤ 30 kW	Minimum fan efficiency, η [%]	>	6,2 x ln(P) +35	6,2 x ln(P) +42
	P > 30 kW			56,1	63,1
UVUs with air treatment		SFP	<	250	230
BVUs		Thermal by-pass of heat recovery system	presence	required	required
	Run-around coil system	Thermal efficiency of heat recovery, η [%]	>	63	68
	Plate heat exchangers, rotary heat exchanger		>	67	73
		SFP	<	Target SFP (formula)	Target SFP (formula) -100

This requirement will be implemented in two steps. The first step will be implemented on 1 January, 2016, and the second, with more stringent demands, on 1 January, 2018.

Ecodesign EU-directive 1253/2014 Efficiency Requirements for Residential Ventilation Units

In contrast to other electrical equipment, the energy classes on the labels of residential ventilation equipment are determined by a calculated parameter, the specific energy consumption, or SEC. This value should display the energy-saving potential of the equipment used in kilowatt-hours per m^2 per year:

SEC class	SEC in kWh/a.m^2
A+ (most efficient)	SEC < -42
A	-42 ≤ SEC < -34
B	-34 ≤ SEC -26
C	-26 ≤ SEC < -23
D	-23 ≤ SEC < -20
E	-20 ≤ SEC < -10
F	-10 ≤ SEC < 0
G (last efficient)	0 ≤ SEC

Moreover, these units have to be accompanied by a manual and a detailed product fiche with specific (technical) information about the product. Specific Ecodesign requirements for Residential Ventilation Units (1253/2014) are as below:

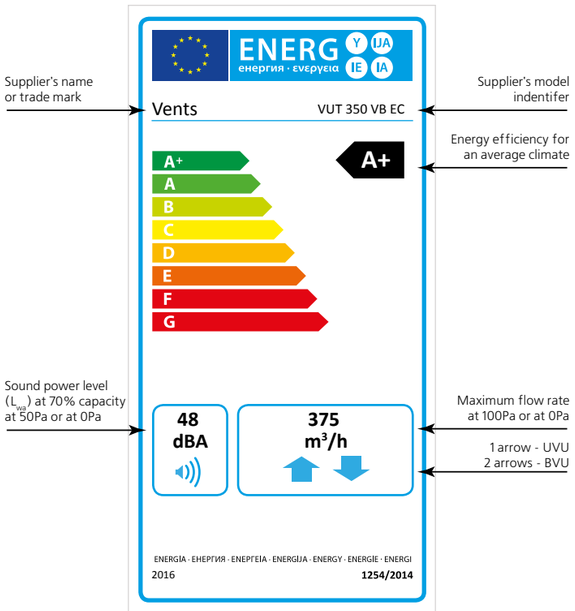
Criteria	ErP 2016	ErP 2018
SEC for average climate kWh/(a.m^2)	< 0	< -20
Min. SEC class	F	D
Sound power level max., dB (Non-ducted using only)	45	40
Multi-speed drive or varible speed drive	Required	Required
Thermal bypass facility for BVU	Required	Required
Visual filter change warining signal	Not required	Required

Energy Labelling EU-directive 1254/2014 Requirements for Residential Ventilation Units

Regulation 1254/2014 requires that from 1 January, 2016, Residential Ventilation Units carry a printed Energy Label with information about energy efficiency, sound and flow rate of the product.

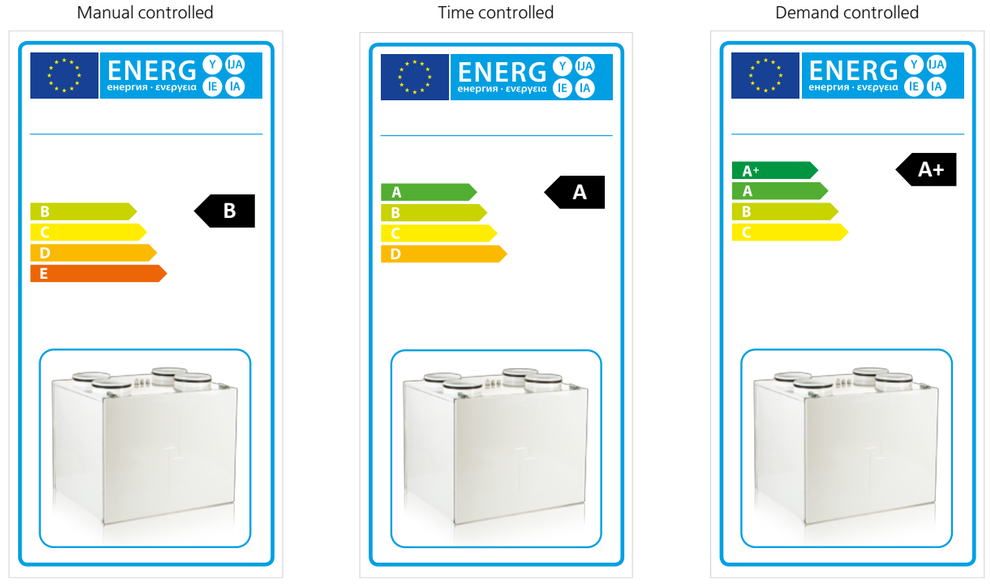
The energy label should permit the end user to compare products easily, enabling them to select energy-efficient products.

Here is how the label should look like, carrying key information for a consumer:



Picture 3

SEC indicator is not only influenced by known parameters such as electrical power consumption or heat recovery, but to a great degree, by the mode of operation as well.



Picture 4

Non-Residential Units are not in the scope of regulation 1254/2014 and will therefore not carry a label.

Responsibility

The supplier

- Makes sure his products satisfy the ecodesign requirements;
- Provides his products with an energy label;
- Provides his products with a user manual;
- Provides his products with a product fiche;
- Makes sure that the lables, the manuals and the product fiches are available on his website;
- States the specific energy consumption of the specific model in all communication about his products.

The dealer/installer

- Informs and advices the end user;
- Makes sure the right label is put on the product;
- Makes sure that the labels, the manuals and the product fiches are available on his website;
- States the specific energy consumption of the specific model in all communication about his products.