HVAC fundamentals

ErP and Lot 6

ErP stands for "Energy Related Products". ErP is supported by Ecodesign Directive (2009/125/EC) to make the use of energy and energy related products more efficient, by improving the energy specification products need to meet and phasing out inefficient products.

The Ecodesign Directive is a vital part of the European Union's commitment to reaching the 2020 goals, aiming to reduce greenhouse gas emissions by 20% and overall energy consumption by 20%.

EU Ecodesign Regulation nº 1253/2014 for Ventilation Units lot 6 came into force on 1 January 2016. It has also been enacted into UK law by statutory instrument 2015 nº 469. The regulation concerns ventilation units, a highly relevant product area, since ventilation, heating and air conditioning represent about 15% of the total energy consumption in the EU, and there is a wide variance in energy efficiency among the products on the market[i].

The Ecodesign Directive Lot 6 will achieve its target by setting up minimum performance requirements for ventilation products, which will be implemented in steps from 2016 to 2018.

Note: Ecodesign Directive requirements are in addition to those of Part L of the Building Regulations.

Scope

Regulation (EU) nº 1253/2014 applies to ventilation units (VUs) i.e. electricity driven appliance equipped with at least one impeller, one motor and a casting and intended to replace utilised air by outdoor air in a building or a part of a building.

The two main types of VUs on which the Ecodesign requirements have been based are:

1. **Residential ventilation units: RVUs**
   Ventilation unit where
   a) The maximum flow rate does not exceed 250 m^3/h
   b) The maximum flow rate is between 250 and 1000 m3/h, and the manufacturer declares its intended use as being exclusively for a residential ventilation application
2. **Non residential ventilation units: NRVUs**
   Ventilation unit where
   a) The maximum flow rate is between 250 and 1000 m^3/h, and the manufacturer has **not** declared its intended use as being exclusively for a residential ventilation application
   b) The maximum flow rate of the ventilation unit exceeds 1000 m^3/h

What does it mean?

For bidirectional ventilation units: BVUs
AHUs used in a balanced ventilation system in a building (fans in supply-air and fans in extract-air) have to be equipped with a heat recovery system (HRS) and to contain filters in supply and extract-air. In addition, the electrical power consumption of the fans regarding these demands is restricted.

For unidirectional ventilation units: UVUs
AHUs which are a part of hybrid ventilation system (fans combined with natural supply or exhaust), have to meet minimum static fan efficiency.

This regulation shall not apply to ventilation units which the electric power input is less than 30W (per air stream) or axial or centrifugal fans, which are only equipped with a housing. In addition, the following applications (non-exhaustive list) are considered to be process ventilation and are therefore out of scope of the regulation:

- Single state smoke extract fans, as long as these are not used for daily ventilation on demand
- Where operating temperatures of the air being moved exceed 100ºC
- Fans for ambient temperatures above 65ºC
- Supply voltage exceeds 1000 V ac or 1500 V dc
- In toxic, highly corrosive or flammable environments or in environments with abrasive substances
- AHU includes a heat exchanger and heat pump for heat recovery
- When applied for kitchen range hoods
- Swimming pools
- Agricultural applications
- Foundries, forging processes
- Halls with industrial furnaces
- Paper production

HVAC fundamentals

ErP and Lot 6

As well as the above exclusions, air which is not classed as ventilation, such as recirculation air heating/cooling systems according to Lot 21 and, as such, if the unit is only operating in these conditions, the units are excluded.

Note: It is not only new buildings that are affected but also renovation of existing buildings.

Further guidance on UK compliance can be found on the government website: www.gov.uk/guidance/placing-energy-related-products-on-the-uk-market

Requirements for non-residential ventilation units

Bidirectional ventilation unit

Combination unit supply and extract air: Two directions airflow

ErP stage			ErP 2016	ErP 2018
Heat recovery system (HRS) BVU with thermal by-pass facility			Required	Required
Thermal dry efficiency of heat recovery [EN308] ηt [%]	Plate heat exchanger, thermal wheel		67	73
	Run-around coil system		63	68
Internal SFP value (reference configuration) SFPint_limit [W/(m3/s)]	Plate heat exchanger, thermal wheel	qnom < 2 m3/s	1200+E-300 x qnom/2-F	1100+E-300 x qnom/2-F
		qnom ≥ 2 m3/s	900+E-F	800+E-F
	Runaround coil system	qnom < 2 m3/s	1700+E-300 x qnom/2-F	1600+E-300 x qnom/2-F
		qnom ≥ 2 m3/s	1400+E-F	1300+E-F
Efficiency bonus E Heat recovery system [W/(m3/s)]	Plate heat exchanger, thermal wheel		(ηt-67) x 30	(ηt-73) x 30
	Runaround coil system		(ηt-63) x 30	(ηt-68) x 30
Filter correction value F [W/(m3/s)]	Reference configuration		0	0
	Filter M5 is missing		160	150
	Filter F7 is missing		200	190
	Filters M5 + F7 are missing		360	340
Variable speed drive from ventilator			Required	Required
Filter pressure switch			Not required	Required

Reference configuration

- 2 airflows
- 1 filter F7 (ODA)
- 1 filter M5 (ETA)
- Heat recovery system
- 2 fans

Unidirectional ventilation unit

Supply or extract air unit: One direction airflow

ErP stage		ErP 2016	ErP 2018
Minimum fan efficiency ηsys [%]	Psys ≤ 30kW	6.2 x ln(Psys) +35	6.2 x ln(Psys) +42
	Psys ≥ 30kW	56.1	63.1
Internal SFP value (reference configuration) SFPint_limit [W/(m3/s)]		250	230
Variable speed drive from ventilator		Required	Required
Filter pressure switch		Not required	Required

Reference configuration

- 1 airflow
- 1 filter F7
- 1 fan

Further information

VES has developed a one-hour CPD to explain in full each part of Regulation (EU) no 1253/2014 and detailed effects on the design, specification and installation of AHUs. To book a CPD session, go to http://goo.gl/pTCk1L

References:

[i] *www.hvnplus.co.uk*

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