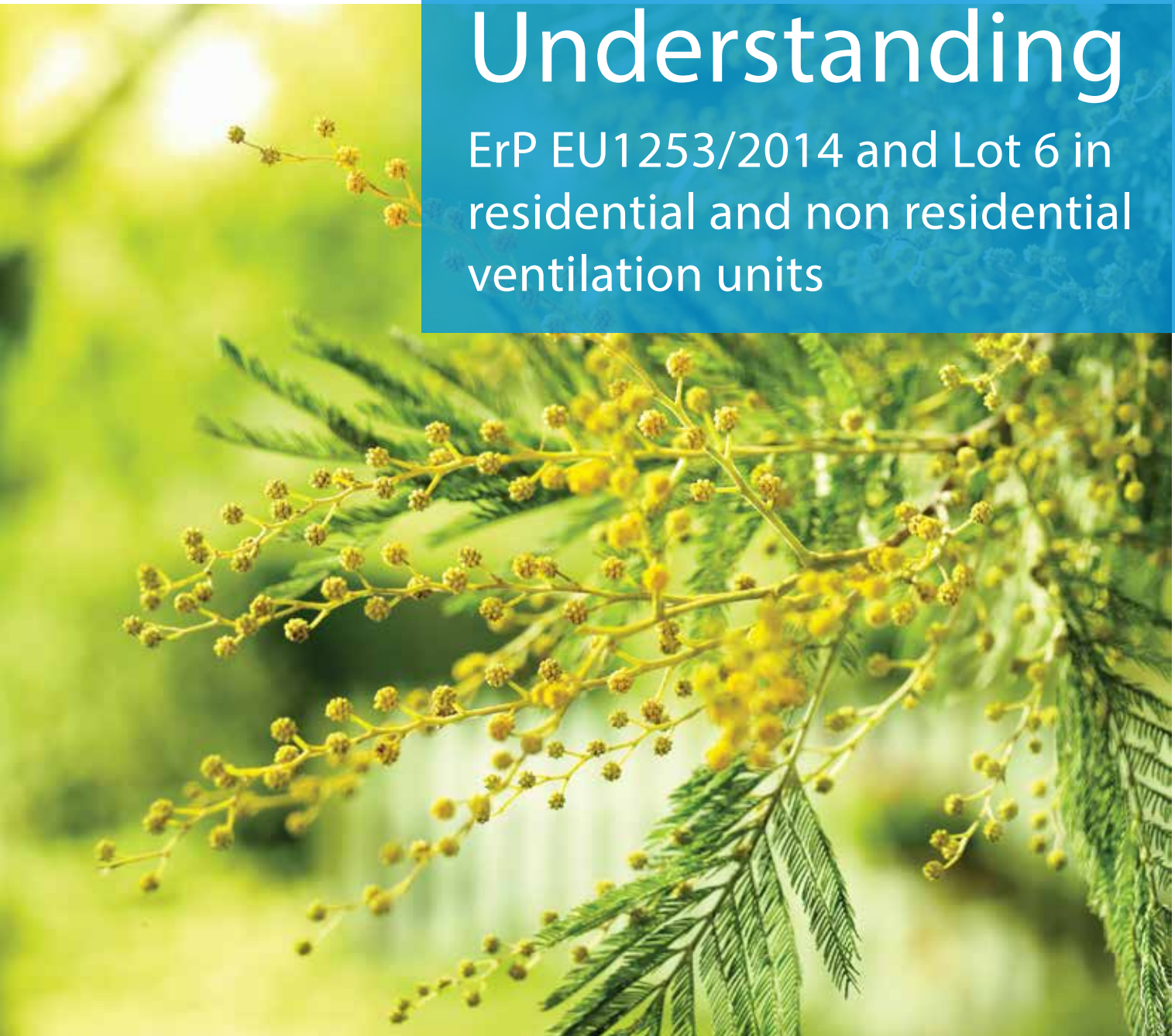


# Understanding

ErP EU1253/2014 and Lot 6 in residential and non residential ventilation units



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# What is...

## ErP?

ErP stands for 'Energy Related Products'. The EU commission regulation 1253/2014 is directly supported by the Ecodesign Directive 2009/125/EC which establishes a framework for setting the eco-design requirements for energy-related products. The mandatory framework seeks to improve the overall energy efficiency standards of energy-related products through the implementation of definitive guidelines for design; helping to make energy-related products more efficient, energy information more readily available, and aid with the phasing out of inefficient products.

The European Union's (EU) Ecodesign Directive's scope covers more than 40 different product groups responsible for up to 40% of all greenhouse gas emissions in Europe. In the UK alone, energy-related products account for around 55% of the UK's total non-transport energy use. EU1253/2014 places particular emphasis on the energy efficiency of ventilation products with the aim of reducing the greenhouse gas emissions and overall energy consumption of all ventilation equipment.

## Lot 6?

The EU Ecodesign Directive is split into a number of different areas of related products called 'Lots'. Lots create a focus on products with the highest energy consumption and therefore the highest potential for energy savings.

The Lot 6 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.

The Ecodesign Directive Lot 6 has achieved its target by setting up minimum performance requirements for ventilation products since its introduction in 2016 and update in 2018. Further updates are expected.



## The scope of EU1253

EU 1253/2014 applies to Ventilation Units (VU), meaning an electricity-driven appliance equipped with at least one impeller, one motor, and a casing intended to replace utilised air by outdoor air in a building or part of a building.

Ventilation units are split into two different classifications, 'Residential Ventilation Units (RVU)' and 'Non-Residential Ventilation Units (NRVU)':

### Residential Ventilation Unit (RVU):

- Maximum airflow rate does not exceed 250 m<sup>3</sup>/hr.
- Maximum airflow rate is between 250 m<sup>3</sup>/hr – 1000 m<sup>3</sup>/hr and the manufacturer has declared its intended use as being exclusively for a residential ventilation application.

### Non-Residential Ventilation Unit (NRVU):

- A ventilation unit where the maximum flow rate exceeds 250 m<sup>3</sup>/hr, and, where the maximum flow rate is between 250 m<sup>3</sup>/hr and 1000 m<sup>3</sup>/hr, the manufacturer has not declared its intended use as being exclusively for a residential ventilation application.

### Both RVUs & NRVUs have 2 different unit types:

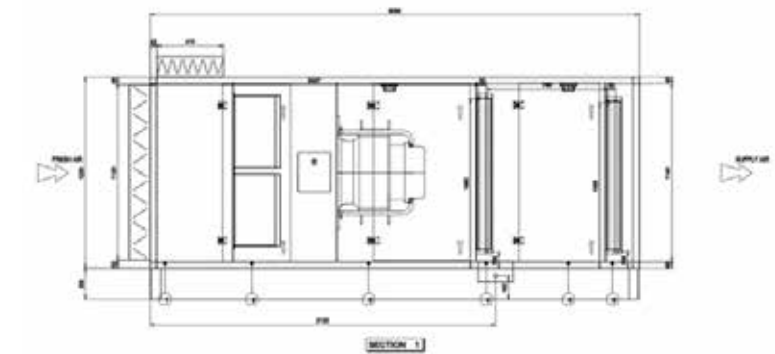
**Unidirectional Ventilation Unit (UVU);** means a ventilation unit producing an air flow in one direction only, either from indoors to outdoors (exhaust) or from outdoors to indoors (supply), where the mechanically produced air flow is balanced by natural air supply or exhaust.

I.e., 1 x airflow, 1 x F7 filter, 1 x fan = supply-only configuration.

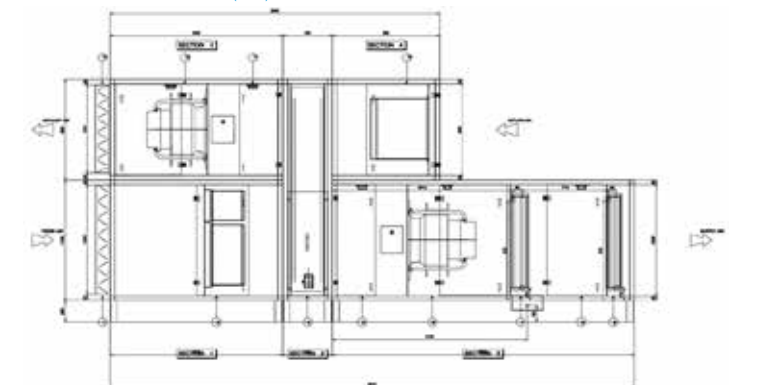
**Bidirectional Ventilation Unit (BVU);** means a ventilation unit which produces an air flow between indoors and outdoors and is equipped with both exhaust and supply fans.

I.e 2 x airflow (supply & extract), 1 x F7 filter (ODA), 1 x M5 filter

Unidirectional Ventilation Unit (UVU)



Bidirectional Ventilation Unit (BVU)





# Requirements

## RVU and NRVU

### Residential Ventilation Unit (RVU) requirements:

From 1 January 2018:

- › SEC, calculated for average climate, shall be no more than – 20 kWh/(m2.a).
- › Non-ducted units including ventilation units intended to be equipped with one duct connection on either supply or extract air side shall have a maximum LWA of 40 dB.
- › All VUs, except dual-use units, shall be equipped with a multi-speed drive or variable-speed drive.
- › All BVUs shall have a thermal bypass facility.
- › Ventilation units with a filter shall be equipped with a visual filter change warning signal.

ErP Requirement	ERP 2018	
Minimum fan efficiency ( $\eta_{sys}$ ) (%)	$P_{system} = \leq 30kW$	$6.2 \times \text{int} (P_{system}) + 42$
	$P_{system} = \geq 30kW$	63.1%
Internal SFP value (reference configuration) – SFPint_limit (W/(m3/s))		230



### Non-Residential Ventilation Unit (NRVU) requirements:

From 1 January 2018:

- › All ventilation units, except dual use units, shall be equipped with a multi-speed drive or a variable speed drive. All BVUs shall have a HRS. The HRS shall have a thermal by-pass facility.
- › The minimum thermal efficiency of all HRS except run-around HRS in BVUs shall be 73 %.
- › The minimum thermal efficiency of run-around HRS in BVUs shall be 68 %.
- › The minimum fan efficiency for UVUs ( $\eta_{vu}$ ) is —  $6,2 \% * \text{Input Power} + 42,0 \%$  if  $P \leq 30 \text{ kW}$  and  $= 63,1 \%$  if  $P > 30 \text{ kW}$ .

ErP Requirement	ERP 2018	
Heat recovery system (HRS) with thermal bypass	Required	
Thermal dry efficiency of heat recovery system ( $\eta_t$ ) (EN308)	Plate heat exchanger or thermal wheel	73%
	Run-around coil	68%
Maximum Internal SFP value (reference configuration) – SFPint_limit (W/(m3/s))	Plate heat exchanger or thermal wheel	$\leq 2m/s$ velocity: $1100 + E - 300x \text{qnom}/2 - F$
		$\geq 2m/s$ velocity: $800 + E - F$
	Run-around coil system	$\leq 2m/s$ velocity: $1600 + E - 300x \text{qnom}/2 - F$
		$\geq 2m/s$ velocity: $1100 + E - F$
Efficiency bonus (E) for the heat recovery system (W/(m3/s))	Plate heat exchanger or thermal wheel	$(\eta_t - 0.73) \times 3000$
	Run-around coil system	$(\eta_t - 0.68) \times 3000$
Filter correction value (F) (W/(m3/s))	Reference configuration is complete	0
	Medium filter is missing	150
	Fine filter is missing	190
	Medium & fine filters are missing	340

- › Worked example based on 2.31 m3/s at >2m/s velocity, with only a fine filter and a dry thermal wheel heat recovery efficiency of 74%:
- › Maximum Internal SFP value (reference configuration) =  $800 + E - F$ :  $800 + (0.74 - 0.73) \times 3000 - 150 = 680 \text{ W/m}^3/\text{s}$
- › Provided the actual Internal SFPi of the unit considering one stage of filter and the HRS is less than the maximum figure calculated as per the ErP 2018 requirement, then the ventilation unit meets the requirements of the ErP directive.

# Exemptions from the Ecodirective

This Regulation shall not apply to ventilation units which:

- (a) are unidirectional (exhaust or supply) with an electric power input of less than 30 W.
- (b) are bidirectional, with a total electric power input for the fans of less than 30 W per air stream.
- (c) are axial or centrifugal fans only equipped with housing in terms of Regulation (EU) No 327/2011.
- (d) are exclusively specified as operating in a potentially explosive atmosphere as defined in Directive 94/9/EC of the European Parliament and of the Council
- (e) are exclusively specified as operating for emergency use, for short periods of time, and which comply with the basic requirements for construction works regarding safety in case of fire as set out in Regulation (EU) No 305/2011 of the European Parliament and of the Council.
- (f) are exclusively specified as operating:
  - (i) where operating temperatures of the air being moved exceed 100 °C.
  - (ii) where the operating ambient temperature for the motor, if located outside the air stream, driving the fan exceeds 65 °C.
  - (iii) where the temperature of the air being moved or the operating ambient temperature for the motor, if located outside the air stream, is lower than – 40 °C.
  - (iv) where the supply voltage exceeds 1 000 V AC or 1 500 V DC.
  - (v) in toxic, highly corrosive, or flammable environments or in environments with abrasive substances.
- (g) include a heat exchanger and a heat pump for heat recovery or allowing heat transfer or extraction being additional to that of the heat recovery system, except heat transfer for frost protection or defrosting.
- (h) are classified as range hoods covered by Commission Regulation (EU) No 66/2014 (3) on kitchen appliances.

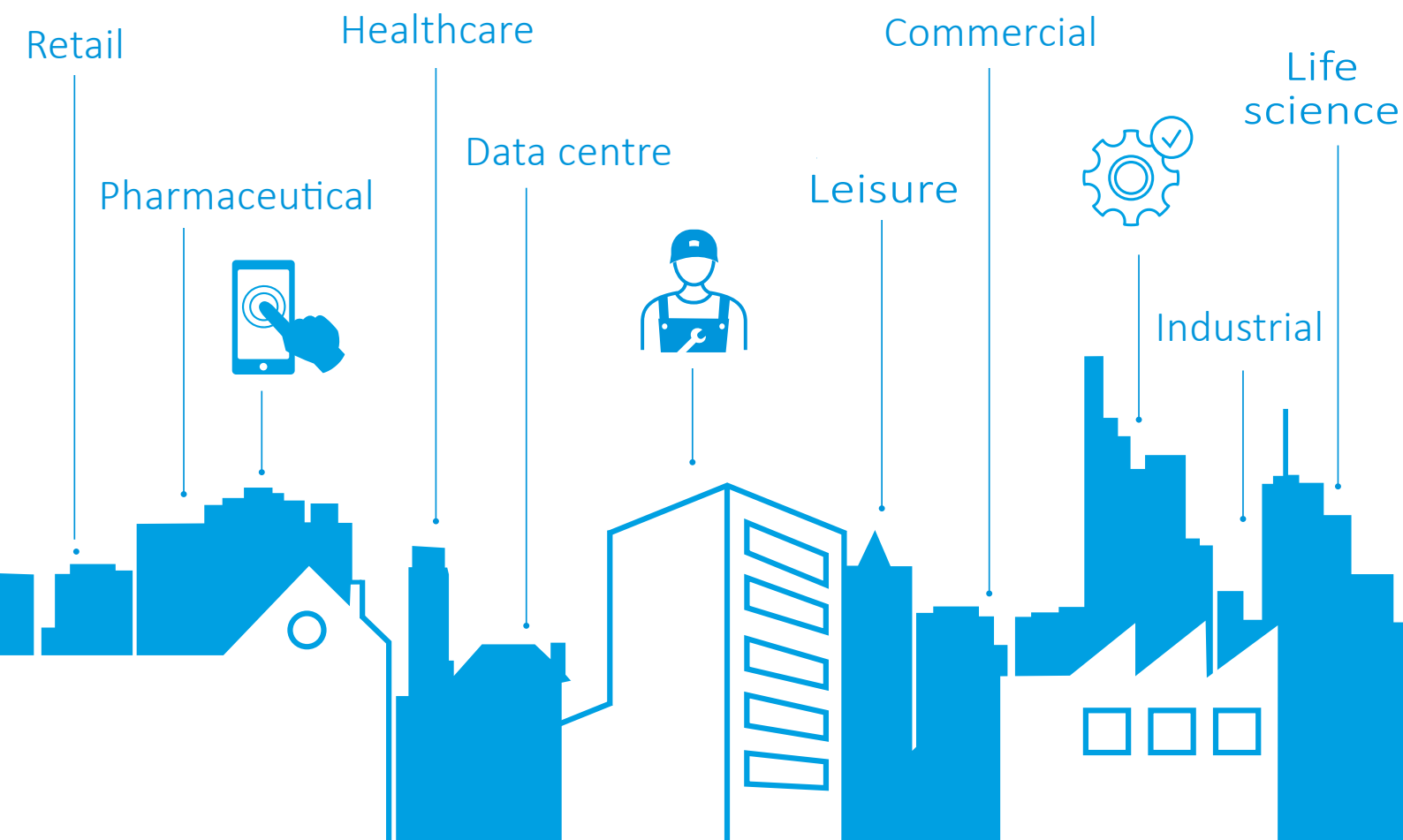
Another consideration for exclusion from the Ecodirective is air which is not classed as ventilation via means of recirculated air heating/cooling systems according to Lot 21. If ventilation units operate under these conditions, then they are in turn also exempt from the Ecodirective.



# How can you be certain the Ecodirective has been met?

We take compliance with the latest standards seriously. Our Astra selection tool for AHUs conducts calculations based on the bespoke selection provided, to ensure ErP Ecodesign compliance is satisfied. A data page of all applicable criteria to the directive is provided as per the example below:

Item	Material
Manufacturer's Name	Daikin Applied Europe S.p.a.
Serial Number	1387949
Typology (NRVU, UVU or BVU)*	NRVU BVU
Drive Type	Inverter (included on the electronic fan )
HRS Type	Other
HRS Thermal Efficiency (EN308)	74 %
Nominal NRVU Flow Rate	
Supply	2.31 m <sup>3</sup> /s
Return	2.31 m <sup>3</sup> /s
Effective Electric Power Input	
Supply	5.66 kW
SFP Internal	417 W/(m <sup>3</sup> /s)
Face Velocity at Flow Rate Design	
Supply	1.54 m/s
Nominal Internal Pressure Drop	
Supply	142 Pa
Return	148 Pa
Nominal External Pressure Drop	
Supply	350 Pa
Return	350 Pa
Efficiency (Reg327/2011)	
Supply	72 %
Return	71 %
External Leakage (RU) +400Pa • -400Pa	1.74 % • 0.87 %
Maximum Internal Leakage	3 %
Summer Outdoor Conditions	30 °C • 40 %
Winter Outdoor Conditions	-5 °C • 100 %
Filter Energy Classification	A A
Filter Service Warning**	Displayed on HMI Controller (by others with ADN units)
Sound Power Level (LWA)	68
Pre-/Dis-assembly Instructions	<a href="https://www.daikinapplied.eu/ahu-instructions-for-pre-disassembly/">https://www.daikinapplied.eu/ahu-instructions-for-pre-disassembly/</a>



For more information email [info@daikinapplied.uk](mailto:info@daikinapplied.uk) or visit [www.daikinapplied.uk](http://www.daikinapplied.uk)

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