

The logo consists of the text 'ErP' in a large, bold, white sans-serif font, with 'READY' in a smaller, bold, white sans-serif font directly below it. The text is centered on a green rectangular background that has a vertical gradient from light green on the left to a darker green on the right.

The Eco-Design Directive ErP. The Requirements.

Tightened Requirements of the EC-Regulation 1253/2014/EG are forcing designers and manufacturers of AHUs to adapt previous solutions.



The Eco-Design Directive ErP.

We are happy to advise you about our possible solutions.
Please send your questions about the Eco-design directive ErP via e-mail to ErP@robatherm.com.
Our ErP-team is always at your disposal.



COMPLIES TO
EUROPEAN
DIRECTIVE
VENTILATION
UNITS (AHU)

The European ErP-Directive 2009/125/EG (Energy-related-Products-Directive), also called the Eco-Design Directive, defines the minimal requirements for energy-related products. The objective of the ErP-Directive is the reduction of energy consumption and the CO2-emission rates as well as an increase of the overall share of renewable energies. This directive applies for all products placed on the market within the European Economic Area (EEA). Exports from the European Community (EC) are not affected by the ErP-Directive.

Relevant for the AHUs is the EC-Directive 1253/2014/EG that came into force on November 26th 2014. As a result of this regulation, new requirements for the energy efficiency of air handling units have been in force in the European Economic Area (EEA) since 2016 and were further tightened in 2018.

With robatherm, you are always on the safe side

The discussion about new requirements on air handling units under the ErP-Directive is characterized by uncertainty and contrarinesses.

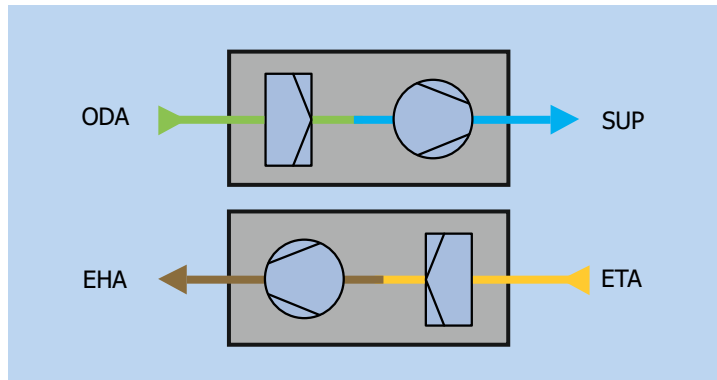
As a premium manufacturer, robatherm feels responsibility to address the topic and to deliver comprehensive and qualified information to all queries concerning this issue.

Answers to most important questions concerning AHUs

<p>What is the scope of application of the ErP 1253/2014?</p>	<p>The directive applies to ventilation units that exchange used air (impurified by persons or building emissions) in a building or part of a building by use of ambient air - typically for those persons present. This does not include applications, during which at least one air flow is defined by an industrial or production process.</p>
<p>In reference to AHUs, which categories are to be taken into consideration?</p>	<p>AHUs with nominal air volumes $\geq 1.000 \text{ m}^3/\text{h}$ will be deemed non-residential ventilation units (NRVU). AHUs $< 250 \text{ m}^3/\text{h}$ count as residential ventilation units (RVU). The declaration for units between 250 and $1,000 \text{ m}^3/\text{h}$ are left up to the manufacturer. In general, other requirements apply to residential ventilation units than to non-residential ventilation units.</p>
<p>When does this apply to AHUs?</p>	<p>AHUs that have been delivered since 1 January 2016 (arrival at the construction site) must comply with the ErP Directive. More stringent requirements have applied since 1 January 2018.</p>
<p>Will there be a further tightening of the ErP requirements?</p>	<p>The EU Commission is planning further requirement levels. However, it has not yet been decided exactly how the requirements will be further tightened. A precise date has not yet been set and the Commission is working on it.</p>
<p>Are there any exceptions in the segment of AHUs?</p>	<p>For example, the following segments have been exempted from the regulation's area of application:</p> <ul style="list-style-type: none"> • Agricultural applications (greenhouses, stables) • Carriage of goods or persons (ships) • Professional kitchen exhaust hoods (grease and steam extraction in commercial kitchens) • Room loaded into thermal energy (Data centers, server rooms, compressor rooms, CHP rooms, foundries, forging processes, ...) • Machine Exhaust Air (garage exhaust air) • ATEX (explosive areas) • Exhaust air not from rooms or supply air not for rooms of a building (chemical fume hood) • Exhaust air of or outdoor air for process applications • Unit with air/air heat pump, if the heat pump works like an HRS • Recirculation units with a maximum outdoor air fraction lower than 10% of the nominal air flow

The Requirements for Non-Residential Ventilation Units at a Glance

Unidirectional Ventilation Unit (UVU)



Supply or extract air unit – Unidirectional Ventilation Unit (UVU)

One direction air flow

Reference configuration:

- 1 air flow

- 1 filter:

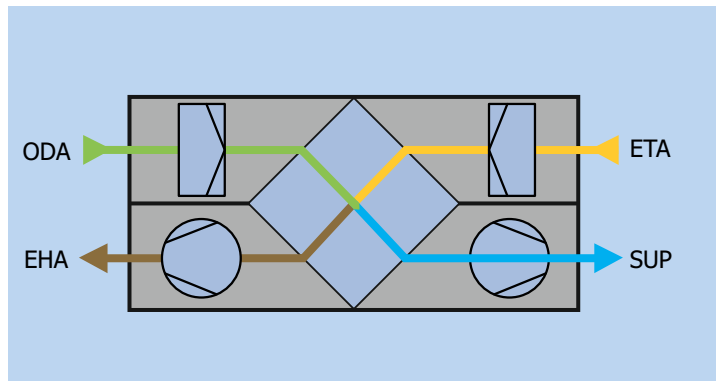
Outdoor air (ODA): ISO ePM1 50%

or outgoing air (ETA): ISO ePM10 50%

- 1 fan

ErP-Tier		ErP-Tier 2018
Fan efficiency η_s [%]	$P_M \leq 30$ kW	$6,2 \times \ln(P_M) + 42$
	$P_M > 30$ kW	63,1
Internal SFP value (reference configuration) $SFP_{int\ max.}$ [W/(m ³ /s)]		230
Variable speed drive of the fan		required
Filter pressure switch		required

Bidirectional Ventilation Unit (BVU)



Combination unit supply and extract air – Bidirectional Ventilation Unit (BVU)

Two directions air flow reference configuration:

- 2 air flows
- 2 filter:

Outdoor air (ODA): min. ISO ePM1 50%

Outgoing air (ETA): min. ISO ePM10 50%

- Heat recovery system
- 2 fans

ErP-Tier		ErP-Tier 2018	
Heat recovery system (HRS) with thermal by-pass facility		required	
Thermal dry efficiency (EN 308) η_t [%]	Run-Around-Coils HRS	68	
	Other HRS	73	
Internal SFP value (reference configuration) $SFP_{int\ max}$ [W/(m ³ /s)]	Run-Around-Coils HRS	$q < 2\ m^3/s$	$1.600 + E - 300 \times q / 2 - F$
		$q \geq 2\ m^3/s$	$1.300 + E - F$
	Other HRS	$q < 2\ m^3/s$	$1.100 + E - 300 \times q / 2 - F$
		$q \geq 2\ m^3/s$	$800 + E - F$
Efficiency bonus E Heat recovery system [W/(m ³ /s)]	Run-Around-Coils HRS	$(\eta_t - 68) \times 30$	
	Other HRS	$(\eta_t - 73) \times 30$	
Filter correction F [W/(m ³ /s)]	Reference configuration	0	
	Filters on the extract air side (ISO ePM10 50%) missing	150	
	Filters on the outdoor air side (ISO ePM1 50%) missing	190	
	Filters missing in both airflows (ODA: ISO ePM1 50% + ETA: ISO ePM10 50%)	340	
Variable speed drive of the fan		required	
Filter pressure switch		required	

The consequences of the ErP Directive in practice

The tightened requirements of the ErP-Directive have far-reaching consequences for both AHU-manufacturers and designers. This is clearly illustrated by the following example. Under the same conditions, for example, an AHU

that was planned in 2015 before the ErP came into force, differs significantly from the solution under the 2018 ErP stage.

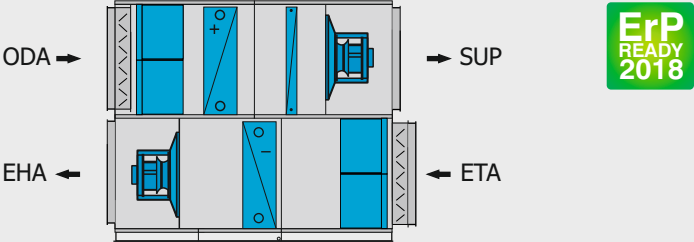
General Conditions	<ul style="list-style-type: none"> • Combined supply and exhaust air unit • Air flow volume: 10,000 m³/h (Supply Air) / Air flow volume: 10,000 m³/h (Exhaust Air) • Outdoor Air Filter ISO ePM1 50%, • Exhaust air filters: ISO ePM10 50% • HRS-System: Run-around coils system • Additional Components: 1 air-heater and 1 damper in the supply air, 1 damper in the exhaust air • EC-Fans
	<p>Air Conditions (DIN EN 308):</p> <ul style="list-style-type: none"> • Outdoor Air: 5°C, 0% r.F. • Exhaust Air: 25 °C, 0 % r.F.

AHU as of 2015 before ErP came into effect

AHU drawing																																				
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Abbreviations for types of air (as specified in DIN EN 16798-3):
 ODA = outdoor air, SUP = supply air, ETA = extract air, EHA = exhaust air

AHUs in accordance with the requirements for 2018 (ErP-Directive)

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Comparison of both unit concepts

ErP-Tier		ErP-Tier 2018
Size of the AHU	Height x Depth	2.728 mm x 1.610 mm (AHU 2015: 2.016 mm x 1.304 mm)
	Increase of the AHU cross section in comparison with the AHU 2015	67 %
Investment costs in comparison with the AHU 2015	Increase from total costs	28 %
	Increase from HRS costs	50 %
	Increase from casing costs	22 %
Energy costs in comparison with the AHU 2015	Costs economy for the energy use	35 %
	Costs economy for the fan use	28 %
Amortization of the higher investment costs in comparison with the AHU 2015		1,7 years

These specific figures only refer to the designated example. However, there is a tendency to observe an increasing space requirement for AHUs due to larger dimensions. An increase

of investment costs can be anticipated, which to a large extent shall be based on the increased HRS-Systems' requirements.

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