Air Handling Units

EUROPEAN ECODESIGN REGULATION

CIAT

CIAT:
RESPONSIBLE THINKING

Designing products and solutions with a lesser impact on the environment and smaller energy consumption lies at the heart of CIAT's longstanding engagement for sustainable development, in keeping with the European climate and energy package objectives for 2030.

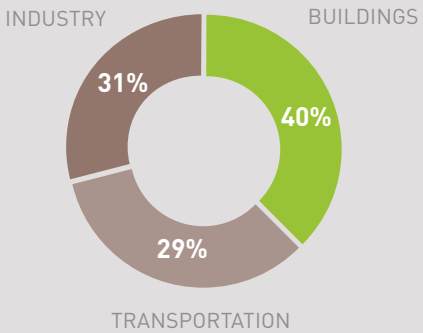
-40%
Greenhouse gas emissions

27%
Energy efficiency improvement

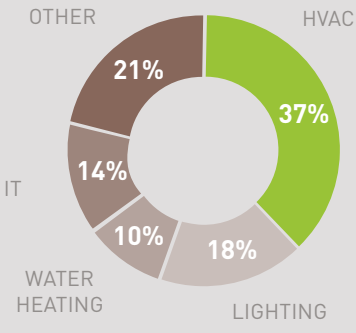
27%
Share of renewable energy

The heating, ventilation and air conditioning (HVAC) market is primarily concerned by this energy efficiency improvement policy.

Buildings being the largest energy consumers and HVAC systems accounting for the better part of this consumption, providing users with energy efficient solutions is both a challenge to be met and a major sustainable development opportunity to be seized by the HVAC industry.



Overall energy consumption



Building energy consumption

A directive has been developped by the European Union in order to meet these objectives, regarding equipment consumption, lighting, IT, water heating and HVAC:

ECODESIGN

Source: World Business Council for Sustainable Development Report

UNDERSTANDING
THE ECODESIGN REGULATION

The 2009/125/CE ErP (Energy related products) European directive sets the requirements linked to the eco design of energy related products. It also encourages manufacturers to take into consideration the environmental impacts of a product during its complete life circle.
Since January 1st 2016, the European regulation n°1253/2014 has been setting new energy efficiency requirements for ventilation units equipped with filters, energy recovery devices, fans and motors.
These requirements will be reinforced from January 1st 2018.

APPLICATION SCOPES

Both residential (RVU) and non residential (NRVU) ventilation units (VU) are concerned with the new regulations.

<table>
<tr><th colspan="3">Flowrate</th></tr>
<tr><th>≤ 250 m³/h</th><th>250 m³/h < [...] < 1000 m³/h</th><th>≥ 1000 m³/h</th></tr>
<tr><td rowspan="2">RVU</td><td>RVU
(if exclusively for a residential ventilation application)</td><td rowspan="2">NRVU</td></tr>
<tr><td>NRVU
(if not exclusively for a residential ventilation application)</td></tr>
</table>

CIAT air handling units ranges are part of the NRVU segment

Examples of applications out of the scope of the regulation:
Unit with outdoor air volume less than 10% - Unit for agricultural applications, eg: greenhouses, stables... - Professional kitchen exhaust hoods - Unit to extract heat rejected by equipment or a manufacturing process , eg: data centres, TV studio, compressors, industrial ovens ... - Unit for marine application, eg: offshore platforms - Unit intended for a building not designed for people or where the presence of people is occasional, eg: paint booth... - ATEX (explosive areas) - Unit with a heat pump to transfer heat between exhaust and supply air streams - Unit operating in an environment with abrasive substances - Unit for emergency use, eg: toxic gas or smoke extraction

OVERALL PRODUCT IMPROVEMENT

Energy Efficiency / Specific Fan Power: a ventilation unit with higher energy efficiency (less absorbed energy per m³ of air treated): higher fan efficiency, lower internal pressure drops.

Energy Recovery: more efficient heat recovery, lower pressure drops

Indoor air quality: better filtration for better air quality and energy efficiency

Information: reinforced product information

GLOSSARY

Terms and abreviations used in this document, as defined by the European regulation n°1253/2014.

- **VU - Ventilation Unit:** An electricity driven appliance equipped with at least one impeller, one motor and a casing and intended to replace utilised air by outdoor air in a building or a part of a building.
- **RVU - Residential Ventilation Unit:** A ventilation unit where:
  (a) the maximum flow rate does not exceed 250 m³/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.
- **NRVU - Non Residential Ventilation Unit:** A ventilation unit where the maximum flow rate of the ventilation unit exceeds 250 m³/h, and, where the maximum flow rate is between 250 and 1000 m³/h, and the manufacturer has not declared its intended use as being exclusively for a residential ventilation application.
- **UVU - Unidirectional Ventilation Unit:** 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.
- **BVU - Bidirectional Ventilation Unit:** A ventilation unit which produces an air flow between indoors and outdoors and is equipped with both exhaust and supply fans).
- **HRS - Heat Recovery System:** The part of a bidirectional ventilation unit equipped with a heat exchanger designed to transfer the heat contained in the (contaminated) exhaust air to the (fresh) supply air.
- **SFPint - Internal Specific Fan Power of ventilation components:** The ratio expressed in W/(m³/s) between the internal pressure drop of ventilation components and the fan efficiency, determined for the reference configuration.

UNDERSTANDING
THE ECODESIGN REGULATION

TECHNICAL REQUIREMENTS FOR NON RESIDENTIAL VENTILATION UNITS (NRVU)

Requirements		2016	2018
UVU			
Variable or multiple speed motors		Yes	Yes
η_{VU} (Fan Efficiency)	P < 30 kW	$\eta_{vu} > 35\% + 6.2\%\ln(P)$	$\eta_{vu} > 42\% + 6.2\%\ln(P)$
	P > 30 kW	$\eta_{vu} > 56.1\%$	$\eta_{vu} > 63.1\%$
SFP_{int} W/(m³/s) (consumption related to internal pressure drops)		250	230
BVU			
Variable or multiple speed motors		Yes	Yes
Heat recovery system		Yes	Yes
Heat exchanger by pass		Yes	Yes
HRS	Run-around exchangers with intermediary fluid	$\eta_t > 63\%$	$\eta_t > 68\%$
	Other exchangers	$\eta_t > 67\%$	$\eta_t > 73\%$
Visual filter change warning or alarm in case of filter pressure drop > Δ_{max}		-	Yes
SFP_{int} W/(m³/s) (consumption related to internal pressure drops)		< SFP_{int_limit} depend upon: Exchanger type & efficiency, $q_{nominal}$, filters	

INFORMATION REQUIREMENTS FOR NON RESIDENTIAL VENTILATION UNITS (NRVU)

For each specific unit, the corresponding detailed technical information (such as product and components identification, type of motorisation, type of exchanger, performances as per regulation...) shall be provided.

ANTICIPATING THE CHANGES: UNIQUE EXPERTISE AND INNOVATIVE TECHNOLOGY

With highly skilled Research &Development teams and laboratories among the largest dedicated to HVAC in Europe, CIAT stands out as a leader in terms of product innovation. CIAT products are thus already in line with the Ecodesign regulation.

ULTRA MODERN LABORATORIES

CIAT benefits from unique facilities, both in terms of cooling coverage, air treatment capacities and measurement accuracy.

Cooling:

- 15 individual test rooms
- ambient control from -25°C to 55°C
- total test capacity of 6 MW

Ventilation:

- acoustics, aeraulics, characterisation of heat recovery systems
- wall panels insulation, casing air leakage and strength, filter by-pass leakage
- air flow testing on heat recovery units from -10°C to +90°C
- individual unit test capacitiy up to 35 000 m^3/h, humidity from 30 % to 90 %

EUROVENT CERTIFICATION AND TESTING CRITERIA

Although products and performances are assessed in CIAT's laboratories under their application conditions CIAT also supports and participates to stringent independent Eurovent Certification Programs for refrigeration, air conditioning, air handling and heating products including tests in accordance with relevant European standards (EN 1886 and EN 13053)

The list of CIAT's certified products and data can be checked on the certification body web site http://www.eurovent-certification.com/ For product under the scope of these regulations Eurovent Air Handling Units (AHU) is the relevant program.

FORWARD-LOOKING INNOVATIONS

CIAT's internal R&D capabilities and our consistent involvement in the European ErP (Energy Related Products) programs such as Vaicteur Air² have been taking our products to new levels of combined thermal and acoustic performance, including ground breaking innovations such as:

- new components, motors, fans, for optimal enery efficiency,
- more efficient filtration solutions for better health protection,
- dimensioning and choice of recovery devices and expert technical advice.

CIAT:
LEADING THE WAY TO SUSTAINABLE COMFORT

CIAT is one of Europe's leading names in heat pump heating, summer comfort and air handling solutions for the residential, commercial, healthcare and industrial sectors. From product design to the definition of water-source systems, CIAT provides solutions based on three fundamentals - comfort, optimisation of energy consumption, and improvement of indoor air quality of buildings. Such triple expertise allows CIAT to offer sustainable systems that guarantee highly advanced energy-efficient equipment that meets environmental certifications and standards.

VENTILATION UNITS & ECODESIGN IMPACT

By 2025, the estimated actual energy saving induced by the Ecodesign regulations 1253 and 1254* will amount to 1300 PJ**, the equivalent of:

52 **million** vehicles removed from the road for one year***

34 **million** homes' electricity use saved for one year***

* Commission regulation EU N° 1253/2014 of 7 July 2014 implementing Directive 2009/125/EC of the European Parliament of the Council with regard to Ecodesign requirements for ventilation units.
** PJ = 10^{15} Joule
***According to the United States Environmental Protection Agency Green Power Equivalency Calculator.

CIAT SOLUTIONS:
ONE STEP AHEAD OF REGULATION

Fully compliant with the 2016 Ecodesign regulation, most CIAT ventilation units have already anticipated the requirements on energy savings and reduced carbon footprint announced for the next regulation upgrade in 2018.

CLIMACIAT™

Taylor made to meet your most specific needs, the latest generation CLIMACIAT air handling units are the perfect response to the Ecodesign challenge: **very high thermal efficiency body, high performance components, filters, heat recovery systems and fans**, in line with your most demanding requirements.

FLOWAY

A forerunner since its launching in 2010 the dual-flow air handling unit stands out as a reference in terms of performance and capacity. With **maximum energy efficiency** and **heat recovery**, it already answers the next level of Ecodesign requirements.

CIAT
AT YOUR **SERVICE**

At CIAT, our objective is to provide high quality service and develop partnerships with you throughout the lifecycle of your HVAC system. We understand your changing needs, develop smart services and energy solutions that optimise energy performance and enable savings.

We provide the support you need to get the most out of your solution:

- Preventive and corrective service maintenance.
- On-site inspection by experts close at hand
- Online parts shop.
- Dedicated hotline for off-site technical support.

We also offer you a comprehensive range of smart services:

- Consultancy service on energy performance upgrade.
- Advanced monitoring and plant system management solutions.
- Equipment and system modernization.

www.ciat.com