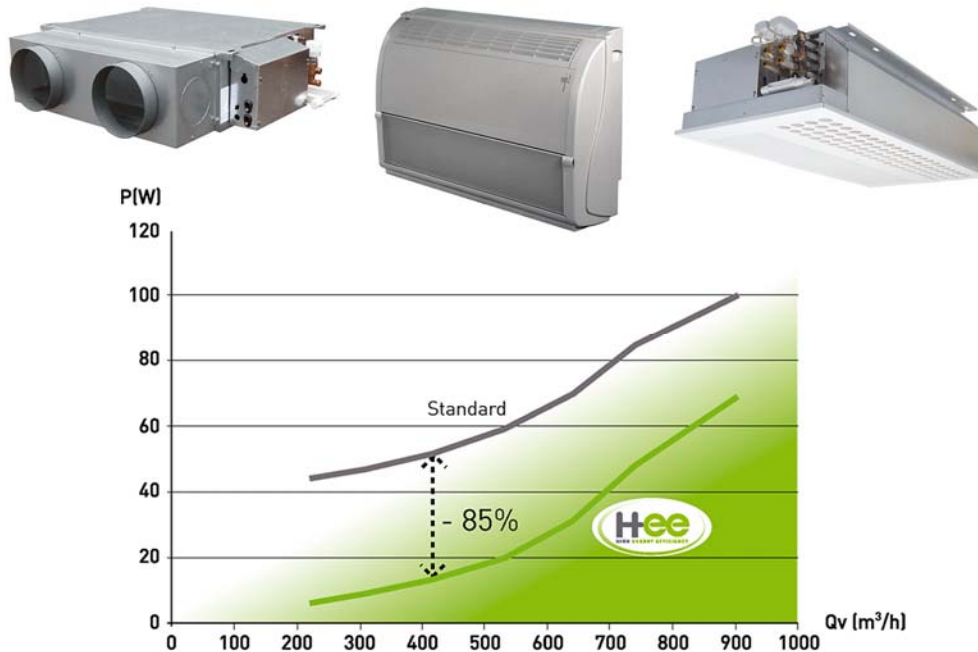




## High Energy Efficiency (HEE) technology

By designing its fan turbines in-house and using brushless motors, CIAT has been able to obtain energy consumption reductions of up to 85% for its entire range of terminal units, including fan-coil units, ducted units and cassettes. The new HEE range is targeted in particular at the office, healthcare and hotel markets.



The remarkable energy performance achieved by the HEE technology is the result of two major innovations. First, whereas the previous fan models were procured off-the-shelf, the new HEE fans have been designed and developed entirely in-house by the CIAT research teams. The geometry of the air turbines has been completely revised and many air-flow studies have been conducted, with the specific aim of improving efficiency. Five models have been developed to cover the whole CIAT range. In addition, whereas previously the turbines were made of aluminium or steel, the new turbines are made of ABS. This means they are lighter and have lower inertia.

At equivalent air flow rates, this redesign has reduced energy consumption by 15%.



HEE fan, brushless motor and control electronics



## PRESS INFORMATION

A second important innovation is the use of brushless motors. The absence of brushes naturally reduces mechanical friction during rotation. Brushless motors are more efficient, generate less noise and have longer lifetimes. Above all, new monitoring and control electronics and a speed controller have been specially developed. This electronic system controls the motor stator which generates the rotating electromagnetic field determining the speed of the rotor (which drives the air turbine). By communicating with the stator, the electronic controller directly controls the air flow supplied by the fan turbine and constantly matches it very precisely to the thermal requirements of the room. The control algorithms have also been specifically optimised to further reduce energy consumption. For example, when the room temperature is very close to the temperature setting the air flow is low, while when there is a big difference the air flow is higher.

The HEE terminal units consume up to 85% less energy than conventional units. In most cases this allows them to pay for themselves in less than three years.

The absence of motor brush friction combined with the very low heating of the motors (low energy consumption) also contributes to the significantly longer lifetimes of the HEE units.

Another feature of the HEE concept is that it is a totally open system. Existing installations can be upgraded gradually, and the HEE terminal units can operate with already-installed controllers, for example three-speed models. Electricity consumption is so low that an existing system can be extended without having to upgrade the building's electricity supply. They already comply with the RT2010 energy consumption standards.

Although the HEE range has only been marketed since the end of March, major orders have already been signed.