

Pure competence in air.

# HIGH EFFICIENCY FANS FOR AIR HANDLING UNITS



Building & Industry

**NOVENCO** 

SCHAKO Group

Powered by  
**TerAx**  
**NOVENCO** 



- EC<sup>+</sup> AHU efficiencies 85%
- Energy savings up to 50%
- Lifetime 20<sup>+</sup> years
- Complete plug-and-play
- Zero maintenance
- Low sound levels
- ROI's between 12-18 months
- Recyclability rate of 98%

# GREEN AMBASSADORS OF EC+

**NOVENCO Building & Industry is a worldwide leader in design, development and manufacture of ventilation products and systems on the technological forefront of efficiency, performance and durability.**

**Together with Danfoss, we provide the most efficient EC+ system solutions, which radically reduce energy consumption, hence increase efficiencies of HVAC systems.**

## ADVANTAGES OF UPGRADING TO EC+

With overall efficiencies up to 85%, the EC+ solutions are the most efficient, profitable and up-to-date available on the market. Conceived to increase efficiencies of HVAC systems, the EC+ concept offers to radically reduce use of energy in new and existing installations. The high EC+ system efficiencies promote large economic savings and ROI's between 12-18 months. The complete plug-and-play solutions guarantee easy and fast new installation or retrofit of existing installations, lifetimes of 20+ years and zero down-times to ensure very low maintenance costs. Furthermore, the environmental impact is diminished and CO<sub>2</sub> emissions are significantly reduced.

All this makes the EC+ solutions strong and capable alternatives for maximisation of the energy efficiencies of ventilation systems for the benefit of operators and the environment.



**System efficiency of 85%**



**Energy savings of 20-50%**



**Lifetime of 20+ years**



**Complete plug-and-play**



**Ultra low sound level**



**ROI's between 12-18 months**



**Zero maintenance**



**98% recyclability**

# AHU SYSTEMS OF THE HIGHEST EFFICIENCIES

### EC+ CONCEPT FOR OPTIMISATION OF AHU SYSTEMS

The straightforward concept comprises the NOVENCO ZerAx® series of high efficiency fans, high efficiency IE4 and or high efficiency Danfoss VLT® frequency drives. The motor and frequency drive efficiencies both reach above 95%, which with the ZerAx® efficiency of 92% brings the overall system efficiency to an impressive 85%. This is 20-25% better than the closest alternative solutions such as direct-driven centrifugal plug fans with EC motors. It is the highest possible total system efficiency for AHU's available on the market.

### ZERAX® - TOP-MOST EFFICIENCY

The engineering of the ZerAx® fans is an unprecedented achievement in NOVENCO history. The ZerAx® revolutionises the design and performance of axial flow fans and is in fact an energy-saver of the future that redefines and heralds a new generation of axial flow fans with unmatched fan efficiency, low sound level and recyclability rate of 98% after its product lifetime of 20+ years. This makes the ZerAx® fans best in class and ready to comply with future environmental legislation. The ZerAx® fans are strong and durable with compact form factors. In new AHU designs, the compact form factor means that these can be smaller, less noisy and lighter. Hence, saving materials and space as well as maximising comfort levels with less sound compared to other fans.



**92%**

NOVENCO ZERAX®  
HIGH EFFICIENT AXIAL FAN

x



**95%**

HIGH EFFICIENT  
PM MOTOR

x



**98%**

HIGH EFFICIENT  
DANFOSS VLT®

=



**85%**

**EC+**

## ENERGY SAVINGS WITH ZERAX® AND EC+

- AT LEAST 20% COMPARED TO BEST-IN-CLASS EC FANS
- TYPICALLY 40% BY RETROFIT OF OLD PLUG FANS
- TYPICALLY 50% BY RETROFIT OF OLD CENTRIFUGAL FANS

# EMPLOY THE HIGHEST EFFICIENCIES AND SAVE ENERGY

To minimize the energy consumption of any ventilation system, fans must use both the static and dynamic pressures. The result is lower energy consumption, reduced operating costs and lower carbon emissions.

## DYNAMIC PRESSURE IS THE KEYWORD

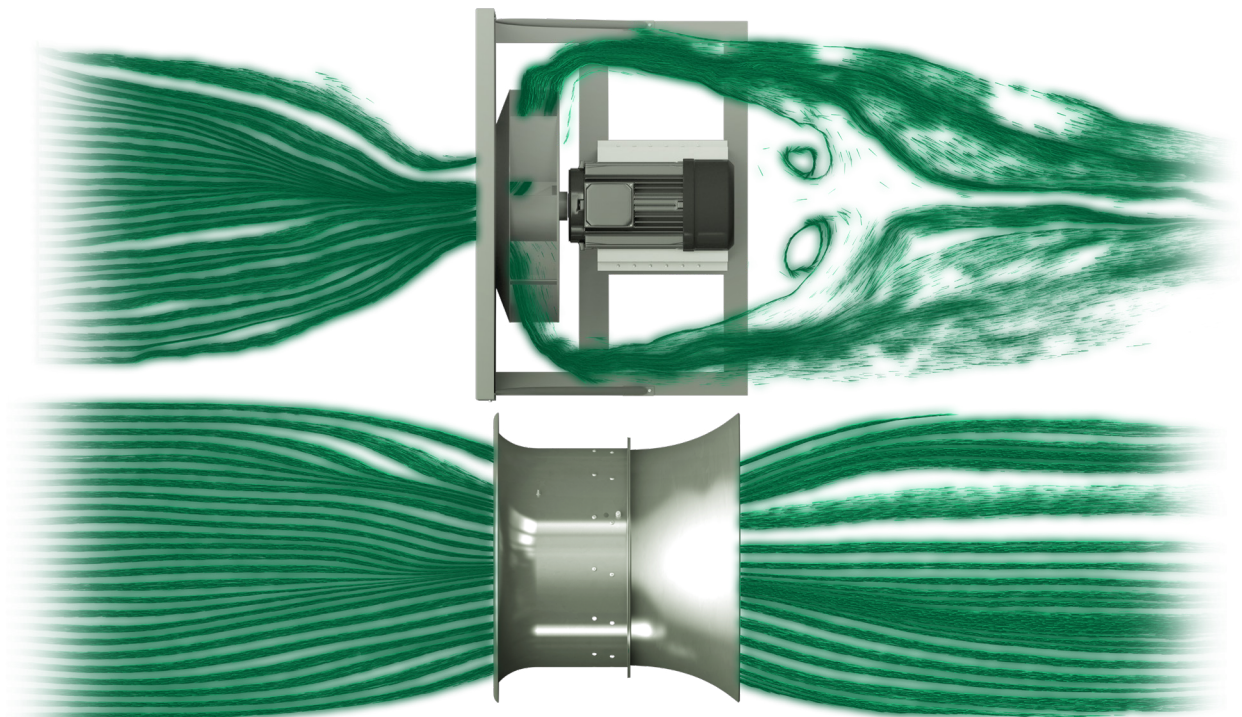
HVAC systems, which only utilise the static pressure, cannot achieve efficiencies above 90%, as the dynamic pressure goes to waste. To achieve the most energy-efficient ventilation system, fans that use both the static and dynamic pressures are required. The efficiency of plug fans is calculated solely on the basis of the static pressure. This is because these systems are unable to utilise the dynamic pressure, which they literally throw away. But, axial fans utilise both the static and dynamic pressures, which means that the efficiencies are based on the total pressure, which makes them capable of achieving efficiencies above 90%.

## ZERAX® - GROUND-BREAKING EFFICIENCY

The majority of plug fans may at best reach efficiencies between 65-70%, while axial fans can perform up to approximately 80%. A main reason for the significant difference is in the way the air moves through the fan. In axial fans the air flows parallel to the fan axis, whereas it flows perpendicular to the fan axis in centrifugal fans and causes loss of velocity energy.

In axial fans, the loss is minimal due to the aerodynamic design that ensures straight airflows with little or no turbulence compared to centrifugal fans. This difference in design generally provides the higher efficiency levels of axial fans.

The NOVENCO's ZerAx® axial fans can reach unmatched efficiencies of 92%. This is ground-breaking new levels for axial fans and lowers the overall power consumption and sound. This makes the ZerAx® the most energy-efficient fan on the market today.



Difference in air flow between plug fans and ZerAx® axial fans

# EC+ FANS VS. EC FANS

Although plug and centrifugal fans are tempting due to the simple and flexible constructions they offer, when compared to axial fans, they are expensive choices in the long run – both in terms of operating costs and environmental impact. A high efficiency axial fan consumes less energy and reduces both costs and carbon emissions.

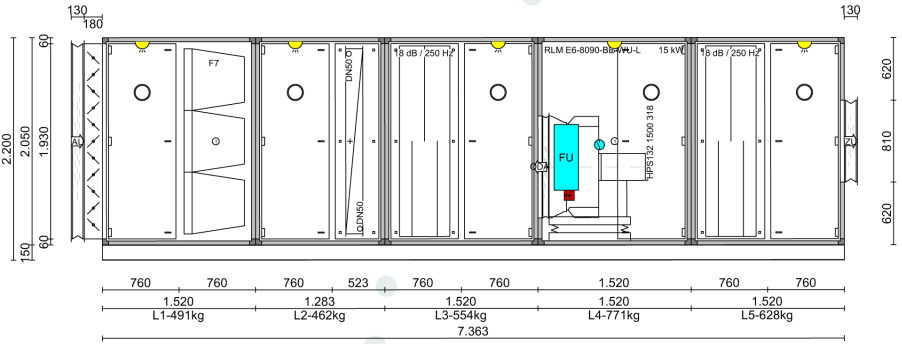
### ZERAX® PROVES BEST IN TEST

NOVENCO Building & Industry has conducted comparative performance tests in the TÜV Süd Test Laboratory. The tests were conducted with identical installation points, measure points, measure units, but with two different fans - one with a premium plug fan from an unspecified fan manufacturer and another with the NOVENCO ZerAx® axial flow fan.

A framework of corresponding test series gave very convincing results - energy saving of 20% and 30% shorter and lighter AHU with the ZerAx® fan than comparable system with plug fan, when compared to the plug fan system.

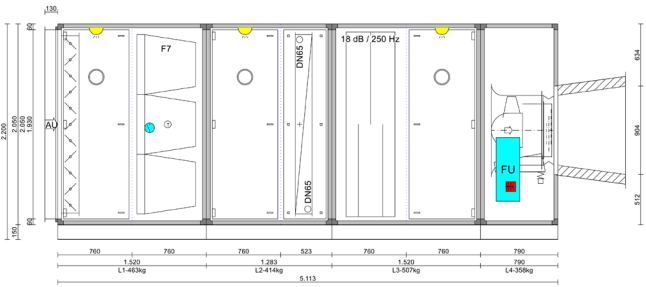
**ZERAX® EC+ FAN INSTALLED MOTOR CAPACITY IS LOWER THAN EC FANS, WHICH MEANS SMALLER:**

- CABLE SIZES
- ISOLATORS AND ELECTRICAL COMPONENTS
- CONTROL ANS STARTER PANELS
- BACKUP POWER SUPPLIES



AHU with plug fan

**COMPLETE AHU LENGTH WITH ZERAX® FAN IS UP TO 30% SHORTER AND 30% LIGHTER, AND ELECTRIC CONSUMPTION IS AT LEAST 20% LOWER THAN THE PLUG FAN SYSTEM**



AHU with ZerAx® axial fan

# SUSTAINABLE VENTILATION TECHNOLOGY

## CASE VOLKSWAGEN GROUP

### THE VOLKSWAGEN GROUP

The Volkswagen Group is Europe's largest automobile manufacturer with production sites in seven European countries. With the group-wide future program "Strategy 2025", Volkswagen wants to get fit for the future with the vision of becoming a world-leading provider of sustainable mobility.

### THE PROJECT

Since the beginning of 2017, Volkswagen has been intensively investigating the technical possibilities of high-efficiency axial fans and has carried out a whole series of tests, measurements and practical trials. At the beginning of 2018 it was time for the next step - implementation of the obtained results and knowledge in new air handling technology. For the renewal of the ventilation system for one of the largest production buildings of the factory at Volkswagen Navarra in Pamplona, Spain, the EC+ technology with highly efficient axial fans was chosen.

### TECHNOLOGY BEST IN CLASS

The high demands from the Volkswagen Group could only be met by the latest generation of air handling units equipped with the highly efficient ZerAx® axial fans from NOVENCO. The full potential of the EC+ system is unleashed through the optimal interaction of the EC+ technology components with ZerAx® axial flow fans, high efficiency permanent magnet motors and intelligent Danfoss VFDs.

### ENVIRONMENTAL EFFECTS

The Volkswagen Group assumes daily responsibility for the environment, whereby emissions receive special attention. Through innovation and impressive planning, the goal is to continuously reduce energy consumption and CO<sub>2</sub> emissions.

For this strategic interest, the new device technology with the ZerAx® axial fans fits perfectly.



### FACTS

- ENERGY SAVINGS OF 20%
- AHUs 30% SHORTER AND LIGHTER
- 20+ YEARS LIFETIME
- VERY LOW SOUND LEVELS
- REDUCTION IN CO<sub>2</sub>



Roof-installed AHUs with ZerAx® axial fan



NOVENCO ZerAx® axial fans in parallel operation

"The demands placed on the air conditioning of buildings increase steadily. Axial fans can make a significant contribution to combining technical requirements with sustainable building design. The new trend-setting AHU technology has fully met all expectations." says Asier Matorell, Factory Planning Manager at Volkswagen Navarra

# THEY CHOOSE ZERAX EC+ TO SAVE ENERGY



# THEY INSTALL ZERAX EC+ IN AHU'S TO SAVE ENERGY



Pure competence in air.

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