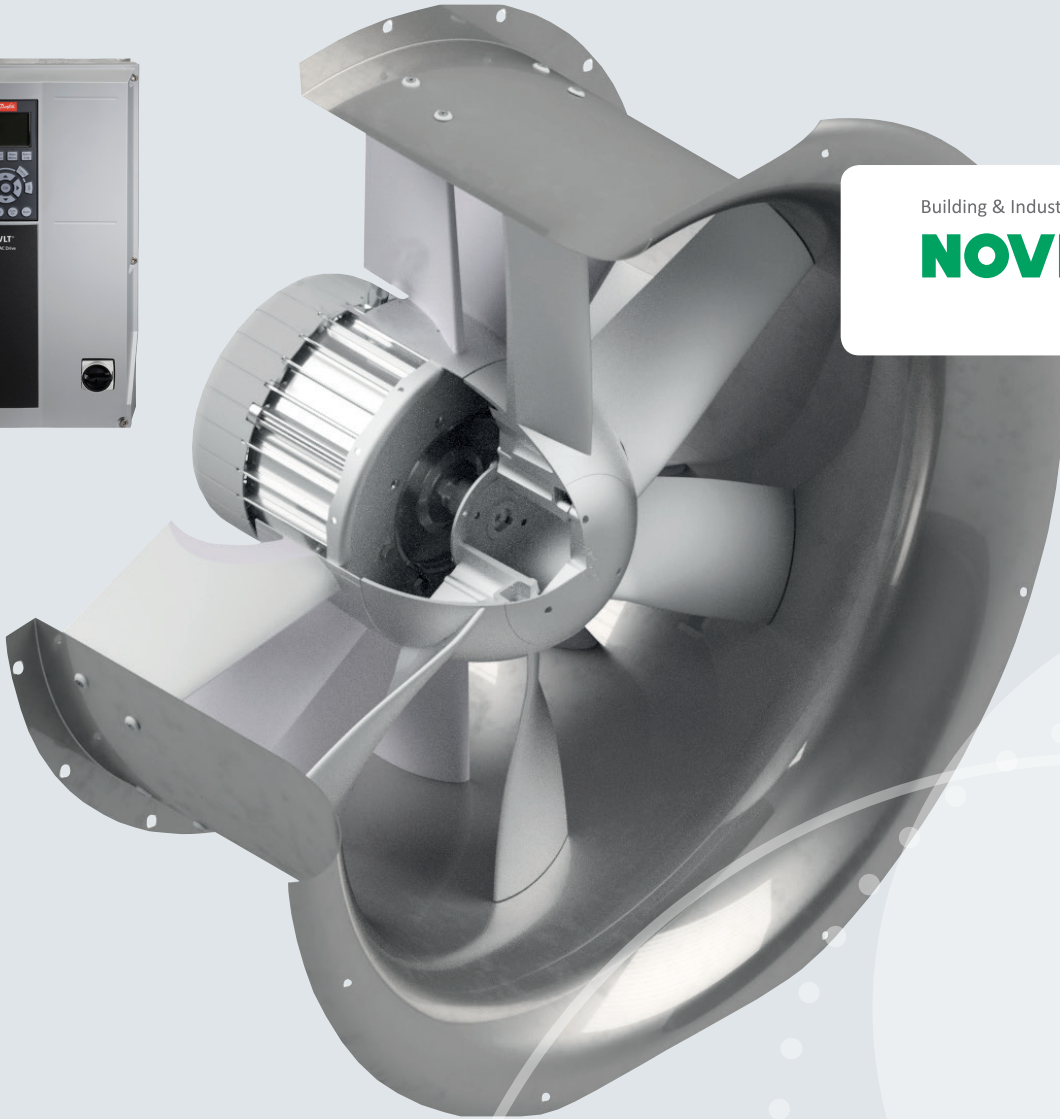


Pure competence in air.

REDUCE ENERGY CONSUMPTION WITH ZERAX® AND EC+ CONCEPT



Building & Industry

NOVENCO 

SCHAKO Group

EC+ AHU EFFICIENCY 85%



SAVE VALUABLE ENERGY

ENERGY IN FOCUS

Today's high cost of energy as well as the increasing level of environmental awareness and political measures, spiral the search for modern and more efficient solutions in the field of energy saving. The environmentally responsible Danfoss EC⁺ concept in cooperation with NOVENCO is the latest market response to growing demands for energy saving. Conceived to increase efficiency of HVAC systems, the EC⁺ concept offers to radically reduce use of energy in new build AHU's and in existing systems. The concept prescribes components for optimum system design - permanent magnet (PM) motors, Danfoss VLT[®] frequency drives and NOVENCO's high efficient ZerAx[®] axial flow fans.

COOPERATION TO OPTIMISE AHU SYSTEMS

Danfoss, a multinational company with headquarters in Nordborg, Denmark, remains consistently focused on the goal

to optimise energy performance, increase efficiency and minimise waste. For NOVENCO Building & Industry the consideration for the environment plays a key role in the design and manufacturing of ventilation equipment and fans. The resource-friendly products reflect this dedication with low operating cost, long life spans and environmentally safe production processes.

Danfoss and NOVENCO now join forces to offer the most efficient system solutions comprising fans, motors and frequency drives (VFDs) for AHUs and other ventilation applications. The system components comprise the ZerAx[®] series of high efficiency fans, high efficiency IE4 and IE5 PM motors and the intelligent and high efficiency Danfoss VFDs. The combined system has the potential to deliver efficiencies in the range of 80 – 85%, which is 15 – 25 percentage points better than the closest alternative solutions such as direct-driven centrifugal plug fans with EC motors.

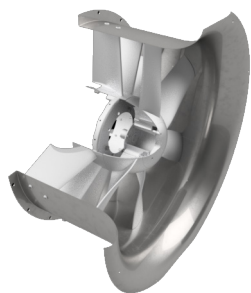
THE EC⁺ CONCEPT

The concept builds on the idea of optimisation of the components that have the greatest effect on the overall system efficiency. In this context, the most efficient technologies are prescribed in the form of PM motors, Danfoss VFDs and the ZerAx[®] fans. The combined system efficiency results from the following equation.

$$\eta_{\text{fan}} \times \eta_{\text{motor}} \times \eta_{\text{drive}} = \eta_{\text{system}}$$

With motor and frequency drive efficiencies both reaching above 95%, the ZerAx[®] efficiency of 92% brings the overall system efficiency to an impressive 85%.

THE EC⁺ EFFICIENCY EQUATION



92%

NOVENCO ZERAX[®]
HIGH EFFICIENT AXIAL FAN

x



95%

PM MOTOR FROM
PREFERRED SUPPLIER

x



97%

DANFOSS VLT[®] WITH MOTOR
INDEPENDENT TECHNOLOGY

=



85%

EC⁺

PREMIUM FAN DESIGN FOR BEST PERFORMANCE

NOVENCO - EXPERIENCE, INNOVATION AND RELIABILITY

Since 1947 our design, development and operation of ventilation products and systems have given us vast experience. The efforts we put into research and development reflect our dedication and allow us to create products on the technological forefront with respect to performance and durability. This is what we consider necessary to stay in front in a world that changes constantly with new environment requirements and calls for innovative solutions from customers and the business environment. The challenges fuel our desire to create the next generation of ventilation products.

ZERAX® - GREEN INNOVATION

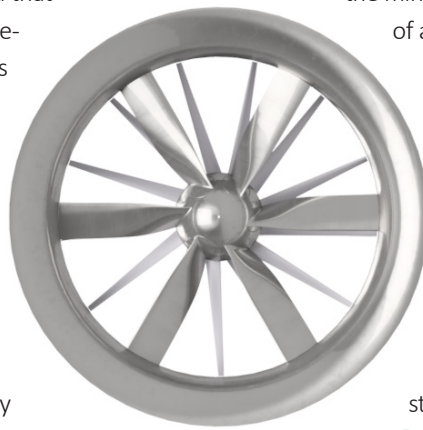
Energy saving is the focus in NOVENCO's design of the ZerAx® axial flow fans. The design, the choice of materials and the many hours of testing show the considerations and efforts we put in. The ZerAx® is an energy-saver of the future that redefines and heralds a new generation of axial flow fans with efficiencies up to 92%, low noise levels and product lifetimes of 20 years.

EVERY DETAIL COUNTS

The engineering of the ZerAx® fans is an unprecedented achievement in NOVENCO history. The foundation is the renowned NOVENCO NovAx™ fans from the 1980s, which efficiency-wise today still is unmatched in many fields. The ZerAx® revolutionises the design and performance of axial flow fans in every detail as the NovAx™ did.

SCULPTING THE PERFECT DESIGN

The cornerstone in the design of the ZerAx® is the airflow. Making this as unimpeded and efficient as possible optimises the fan efficiency. The inspiration for achieving this comes from the aviation industry and the design of rotors in jet engines, where creation of high thrusts is essential. The ZerAx® hub and rotor blades with the minimum blade tip clearance are ideal for shovelling of air through the system. The curvature of the guide vanes after the rotor straighten the air turbulences to remove air rotation and to ensure maximum pressure after the fan.



LESS MASS AND STILL DURABLE

The rotation of the rotor requires energy and one way to reduce this is through use of light materials and optimum design. For these purposes, aluminium is a perfect choice, as it is both strong and light. Most rotating fan parts as well as the guide vanes and motor mount are of aluminium. The inner hub forms the only exception in the larger fan sizes, where it is of cast steel in order to cope with the higher loads. The fan casing and inner tube are also of vital importance to the fan performance. The design must be strong and durable enough to withstand the loads and to minimise vibrations. Here the use of AluZink gives the construction the sought after characteristics.

PRECISION ASSEMBLY

The tolerances in the manufacturing of fan parts are essential for the ZerAx® performance and require high-precision machining. Assembly of the fans requires the same high accuracy to arrive at the top-most efficient of axial flow fans, the ZerAx®.

- ENERGY SAVING OF 20%
- 20+ YEARS LIFETIME
- COMPACT AND EASY TO INSTALL OR RETROFIT
- VERY LOW FAN SECTION SOUND LEVELS
- ROI BETWEEN 12-18 MONTHS

Pure competence in air.

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Building & Industry

NOVENCO 

SCHAKO Group

REFERENCES



DATA CENTRE, SCANDINAVIA



UNIVERSITY OF COPENHAGEN, DENMARK



RANDERS REGIONALHOSPITAL, DENMARK