ENERGY SAVINGS

THERMAL COMFORT

DISINFECTION

CO2 REDUCTIONS

NORDICCO®

CLEAN • CLIMATE-FRIENDLY • COMFORT

English version 2.5

ABOUT NORDICCO

CONTENT

DANISH DESIGN

Nordicco is headquartered in Denmark, where products are designed and manufactured. NORDICCO® fans are specifically designed to meet European demands and expectations when it comes to performance, energy efficiency and design. Wherever possible, we source from local and regional suppliers, to ensure the lowest overall carbon footprint.

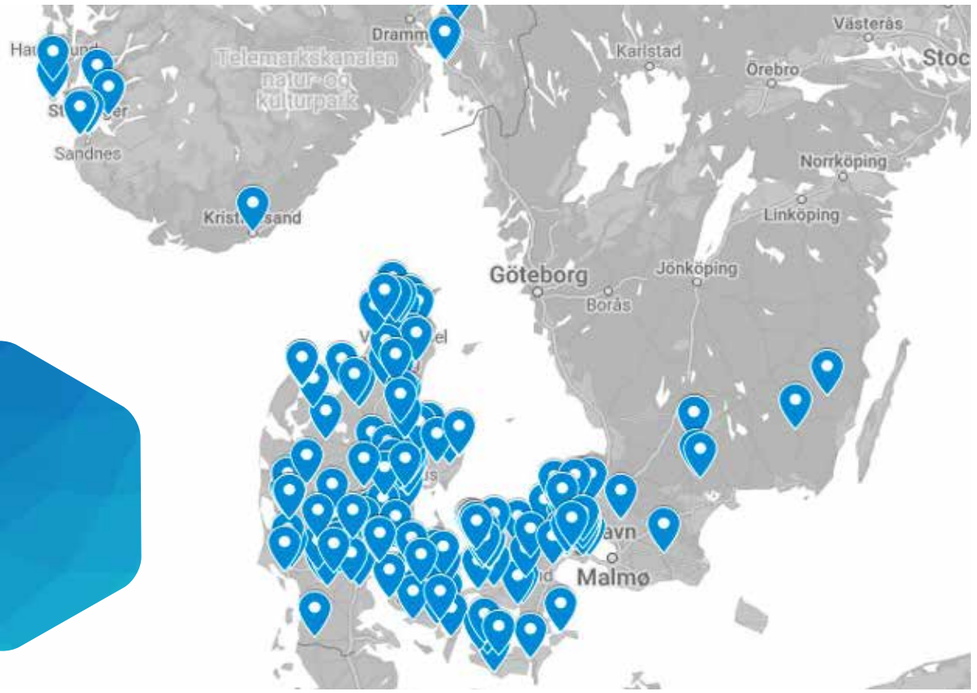
Nordicco is a tech-company that develops and manufactures advanced 'air-movement' solutions. We design products that combine comfort and clean air with energy savings and data. From our headquarters in Denmark we deliver to the entire world.

The Nordicco® product family covers a whole range of disciplines. From small elegant ceiling fans to the market's largest HVLS fans. From systems with built-in disinfection capabilities to those built for particularly challenging environments. As something quite unique in the industry, we also integrate IoT into several product lines. This makes us capable of offering both online fan management as well as data collection, which can highlight energy saving potentials in a given building.

In other words, our solutions can be used to lower energy consumption and reduce CO2-emissions, improve the indoor climate and eliminate airborne bacteria and viruses in buildings.

We have customers in a wide range of segments, covering everythig from SMEs to municipalities and global corporations - and we value each and every one of them. Regardless of their size, it's often with the same intention they collaborate with us; they either seek energy savings or a better indoor climate. In most cases, both.

Nordicco's primary owners are a Danish family from Fredericia and The Greenheck Group, North America's leading manufacturer of air movement products.



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APPLICATIONS

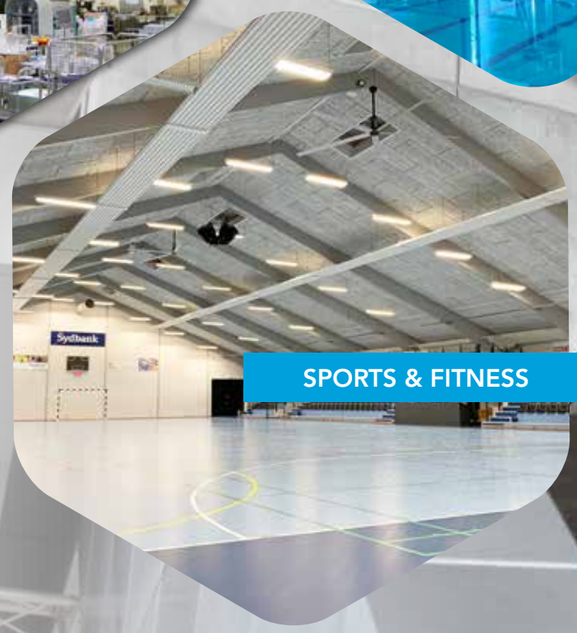
FOYERS & ATRIUMS

LOGISTICS

WAREHOUSING & MANUFACTURING

AQUATIC CENTERS

EDUCATIONAL INSTITUTIONS



SPORTS & FITNESS

CROSSFIT

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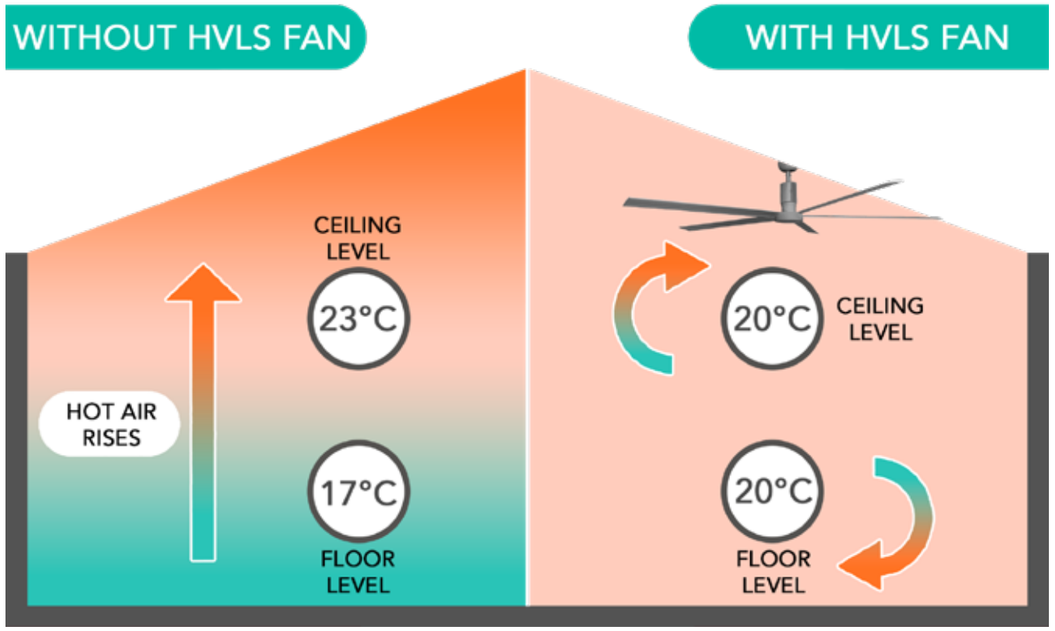
AIRPORTS

THE ENORMOUS POTENTIAL
OF ENERGY EFFICIENCY

Hot air rises and gathers under the ceiling. A basic thermodynamic concept well known from hot air balloons or saunas. Therefore, a temperature difference of several degrees between floor and ceiling level will often be the case in large rooms. The higher the ceiling, the more heat is often wasted.



An HVLS fan creates a calm and silent air flow that effectively equalizes temperature differences between floor and ceiling level. This is done by mixing the different layers of air and distributing existing heat from the ceiling area down towards the occupancy zone. A process also known as temperature equalization or destratification.

This way, heat is utilized much more efficiently. Savings of up to 35% can be achieved. Mainly by taking much better advantage of existing heat, which means the energy consumption can be reduced but also since the load on the ventilation system is lessened.

THE HVLS CONCEPT

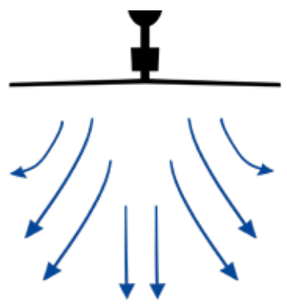
2 ROTATIONAL DIRECTIONS

FORWARD – COMFORT & COOLING

During warm months, the temperature sensation can be significantly reduced when the HVLS fan runs in 'forward' mode. This creates a cooling breeze, also known as 'chill factor'. Furthermore, the fan helps eliminate pockets of stagnant and heavy air and creates a better overall indoor climate.

If mechanical ventilation or airconditioning is installed, then installing fans will lower the pressure on these systems, which in turn reduces the building's total energy consumption.

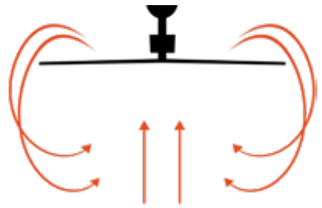
Forward mode



REVERSE – ENERGY SAVINGS

During colder months, the HVLS fan slowly moves warm air (that otherwise gathers at ceiling level) down towards floor level via 'reverse mode'. Not only does this increase the temperature, but it ensures energy-efficient heating. Thus, HVLS fans can be thought of as a tool for optimizing heat consumption and lowering overall energy use as well as CO_2-emissions.

Reverse mode



APPLICATIONS

- Distribution Centers
- Manufacturing Facilities
- Sports Arenas & Fitness Centres
- Educational Institutions
- Public Institutions
- Aquatic Centers
- Event & Conference Venues
- Airports & Hangars

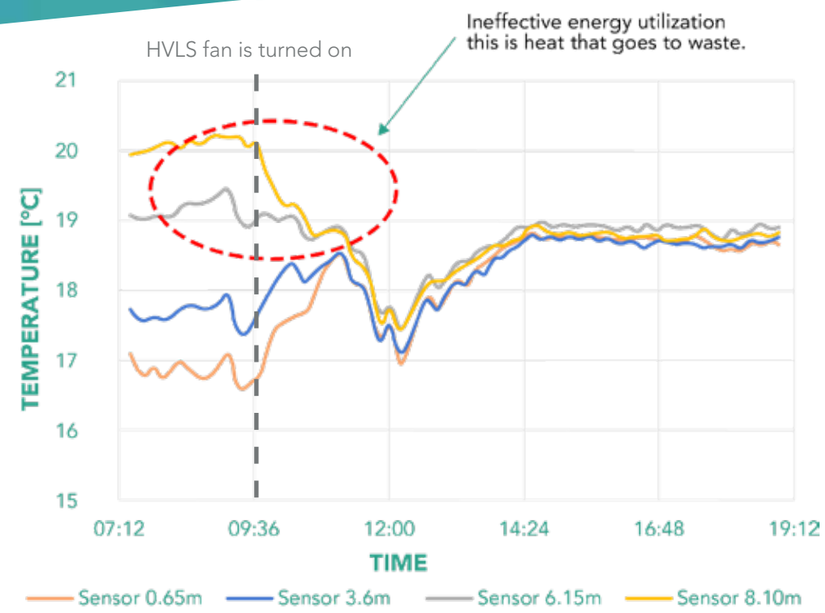
GAIN HUGE SAVINGS ON YOUR HEATING BILL

Energy consumption in buildings make up almost 40% of the total energy use in Denmark. The energy is primarily used for heating, ventilation and lighting*. Therefore, energy renovation of buildings is of great importance when it comes to reducing carbon emissions.

Below is an example of temperature equalization, also known as destratification, in a large space. Sensors placed at different heights in the room measured the temperature *before* and *after* an HVLS fan was turned on. As the graph shows, the temperature is equalized across the four measuring points and a temperature of approx. 19 °C is obtained throughout the entire space. The interesting thing here is that the temperature at floor level increases by 2 °C without adding extra heat.

This way, energy is used much more efficiently which makes it possible to optimize HVAC settings. The result is often dramatic savings on electricity and heating - as well as a reduction in CO_2-emissions.

TEMPERATURE EQUALIZATION BETWEEN FLOOR AND CEILING



*Source: The Danish Energy Agency

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NORDICCO® PRODUCT FAMILY

NORTHERN AIR® MINI

A small, elegant ceiling fan of 1.5 meters with remote control - ideal for smaller rooms.

NORTHERN AIR® PRO

HVLS fans of 3-5 meters in diameter. Often used to achieve energy savings.

NORTHERN AIR® EXTREME

The Extreme series rages from 6-7 meters and is among the world's largest HVLS fans.

NORTHERN AIR® A.E.

Aggressive Environment is designed for tough environments and can resist humidity or dust.

NORTHERN LIGHT® PRO

The most effective system for disinfection and distribution of clean air. Sizes 2-5 meters.

NORTHERN AIR®

Northern Air® is a series of fans that includes both classic ceiling fans and large HVLS fans. HVLS stands for 'high volume - low speed' and, as the name suggests, moves large volumes of air at low speed.

The Northern Air® series is therefore often used to achieve energy savings or indoor climate improvements. It's often described as a climate-friendly supplement to other types of ventilation such as air conditioning. However, the Northern Air® series also consists of a specialized product, namely the Aggressive Environment fan, which has been developed for challenging environments, such as aquatic centers.

NORTHERN LIGHT®

The patented Northern Light® series consists of fans that all have the same advantages as Northern Air® in terms of creating energy savings and a better indoor climate. However, what makes the Northern Light® series unique is that it was developed for disinfection of air. Northern Light® fans have integrated UV-C light in the air blades which can disinfect the air from airborne viruses and bacteria.

The series was developed in collaboration with the Danish Technological Institute and with support from the Innovation Fund during the corona pandemic, where air disinfection needs were at a peak worldwide.

NORTHERN AIR®
MINI

NORTHERN AIR®
PRO

READY TO BEAT THE HEAT?

Northern Air® Mini is a small white ceiling fan operated by remote control. It's ideal for improving the indoor climate in smaller spaces such as classrooms, offices, cafeterias etc. The elegant ceiling fan is based on a high-efficiency direct-drive motor and at a size of 1.5 m in diameter with a weight of just 6 kg, it makes for a quick and easy installation. Despite its modest size, it provides maximum performance.

COMFORT COOL

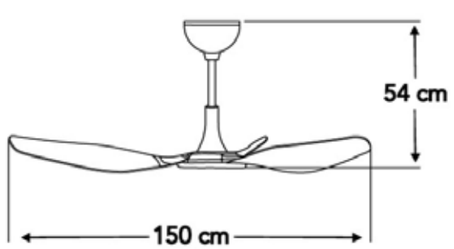
With MINI you can create a gentle breeze which lowers the temperature sensation. Also known as "chill-factor". The advantage of air flow is clear: it costs just a fraction of the price of cooling.

ENERGY EFFICIENCY

Power consumption at normal operation is only 30 Watts. In comparison, an average A/C installation uses 1.000 Watts.

SILENT OPERATION

MINI has 6 speed settings and is operated by RF remote control. It's designed with three air blades angled at 31° to provide maximum air flow yet silent in operation.



Diameter	**1.5 meter**
Power Consumption*	**30 W**
Airflow**	**12.000 m³/h**
Coverage Area	**100 m²**
Control	**RF Remote Control**
Motor	**BLDC**
Material	**ABS**
Voltage	**230 V**

*At normal operations
**At maximum operations

BETTER HEAT DISTRIBUTION & ENERGY SAVINGS

Northern Air® Pro is an HVLS fan that creates energy savings, CO2-reductions and better indoor climate in large rooms such as sports halls and warehouses. Through slow air circulation, it helps equalize temperature differences between floor and ceiling, so heat in a room is used optimally. This can result in energy savings of up to 35%. Pro is also tested and approved for ball games according to DIN18032.

HVAC IS EXPENSIVE

Replacing a ventilation system is expensive. Instead, HVLS fans can be used, as a budget-friendly alternative that can help optimize operations of existing ventilation.

ENERGY SAVINGS

In winter, the fan can move existing heat from the ceiling zone down towards the living zone and mix the different temperature layers, so that heat is used much more efficiently.

CO2 REDUCTIONS

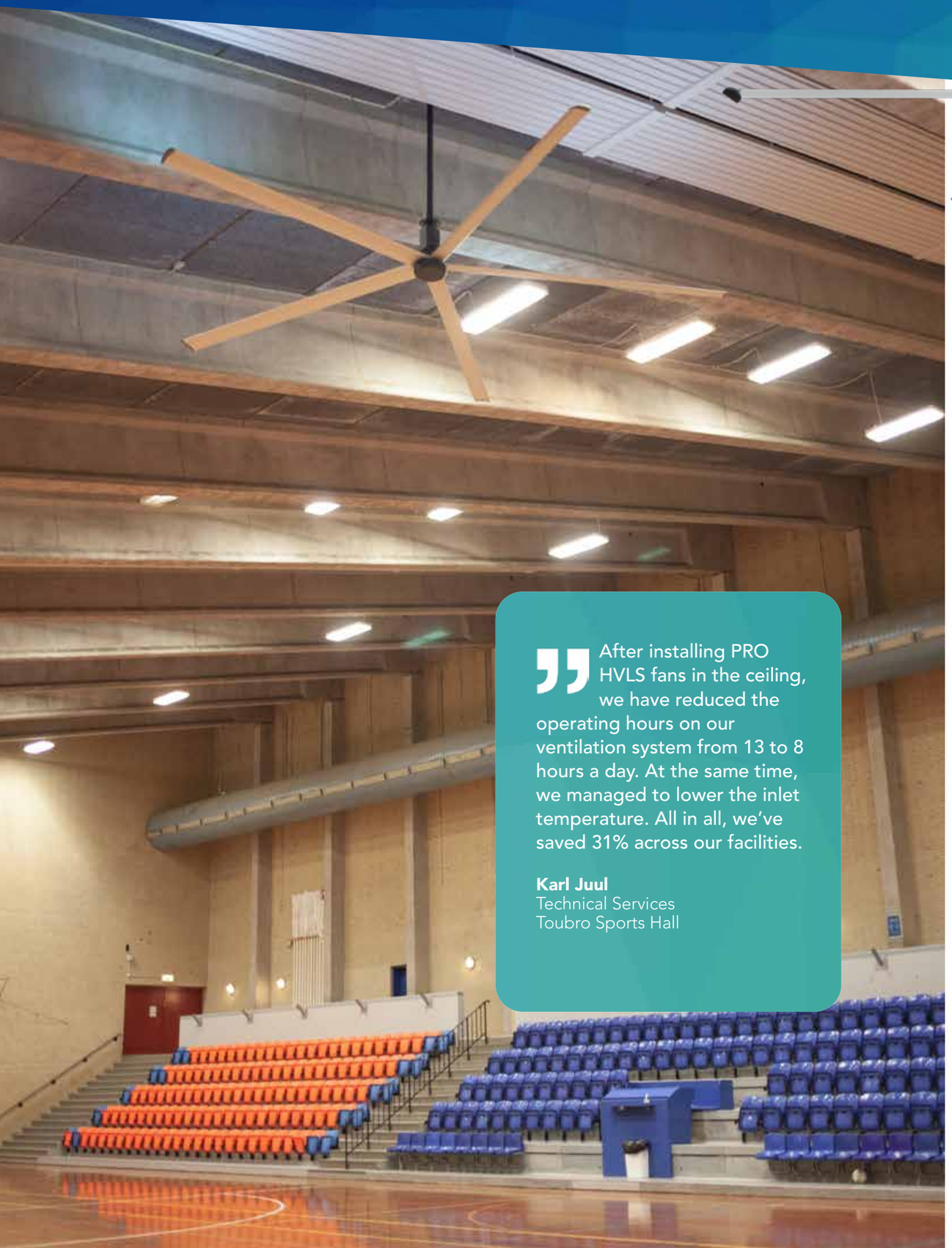
A sports hall of 800 m² can save an average of 3 tonnes of CO_2 annually by installing a Northern Air® fan. In comparison, 1,500 beech trees are needed to absorb the same amount of CO_2.

- **Ideal for rooms over 100 m²**
- **Silent and energy-efficient motor**
- **Integration to BMS via MODBUS RS485**
- **Plug & Play Installation**

Diameter	**3, 4 & 5 m**
Power consumption*	**30 W**
Air performance**	**75.000 m³/h**
Coverage area	**100-1000 m²**
Motor	**Direct Drive**
DIN 18032-3	**BallPlay Tested**

*At normal operations of a 5-meter fan
**At maximum speed of 5-meter fan

NORTHERN AIR®
EXTREME



> After installing PRO HVLS fans in the ceiling, we have reduced the operating hours on our ventilation system from 13 to 8 hours a day. At the same time, we managed to lower the inlet temperature. All in all, we've saved 31% across our facilities.
>
> **Karl Juul**
> Technical Services
> Toubro Sports Hall

HUGE HVLS FAN IDEAL FOR INDUSTRY

The Northern Air® Extreme series is among the world's largest fans - measured by diameter, but also when it comes to air flow. It's particularly suitable for buildings of a very special calibre: distribution centres, warehouses and the like.

SUPERIOR AIR FLOW

Extreme offers extraordinary air flow performance. With its 6 aluminum wings it's designed to move as much as 413,000 m^3 air/h. High ceilings are usually a challenge for other fans, but not Extreme!

ENERGY EFFICIENCY

Northern Air® Extreme contains an efficient direct-drive motor and factory-fitted electronics as well as all necessary cables for Plug & Play installation.

BIGGER IS BETTER

The series is among the world's largest HVLS fans and made for buildings on a bigger scale - warehouses, distribution centers, arenas and similar spaces with massive areas and high ceilings.

GreenheckGroup™
Inspired People Doing Extraordinary Things

The Extreme series has been specially developed by our American partner company Greenheck Group. Greenheck is North America's leading manufacturer of air movement products.

Diameter	**6 & 7,3 meters**
Power consumption*	**332 W**
Air performance**	**413.000 m^3/h**
Coverage area	**2.000-2.200 m^2**
Motor	**Direct Drive**
Material	**Aluminium**
Air blades	**6 pcs.**

*At normal operations
**At maximum operation of the 7.3-meter fan

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NORTHERN AIR®
AGGRESSIVE ENVIRONMENT

HVLS FAN FOR TOUGH ENVIRONMENTS

Northern Air® Aggressive Environment (AE) is designed for harsh environments, such as indoor swimming pools or advanced production facilities, as neither water nor dust can enter the motor or drive. The fan has an IP54 rating and is available in 3, 4, and 5 meters in diameter. It's often used as an energy-efficient supplement to optimize traditional ventilation in aggressive environments.

INDOOR CLIMATE

AE is an HVLS fan that creates continuous air movement. This creates a better indoor climate and can help lower the relative humidity in places such as indoor aquatic centers.

ENERGY SAVINGS

The fan ensures better use of heat trapped at ceiling level but also serves as a ventilation supplement, which helps lessen the load and air flow requirements of ventilation systems, resulting in significant energy savings.

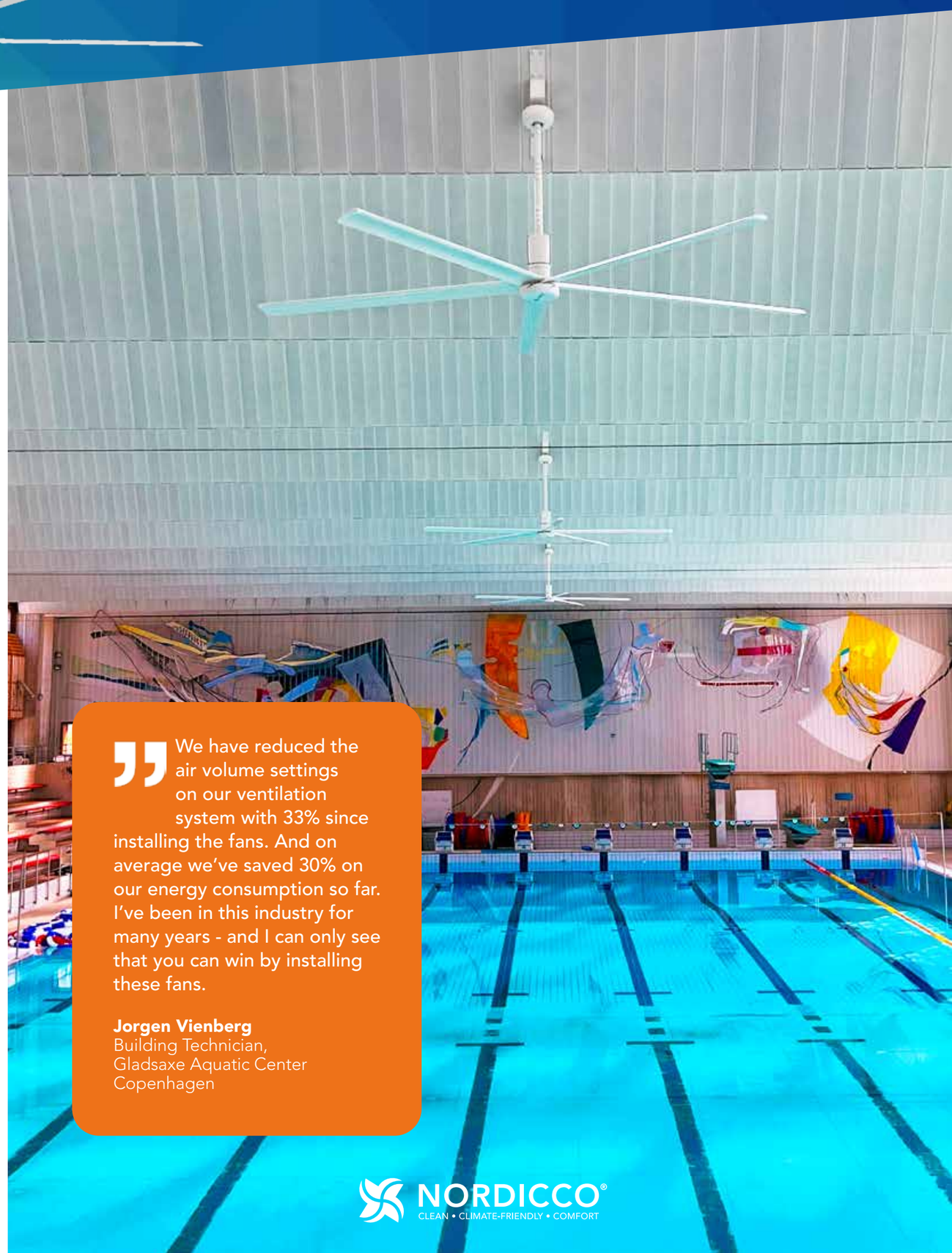
LESS ODOR ISSUES

By mixing the air, the concentration of chlorine vapors and THM substances at water surface level is reduced. This helps reduce a pool's characteristic chlorine smell.

TESTED BY FORCE TECHNOLOGY

Diameter	**3, 4 & 5 m**
Power consumption*	**30 W**
Air flow**	**75.000 m^3/h**
Coverage area	**1000 m^2**
Motor	**Direct Drive**
Rating	**IP54**
Coating / color	**C4 conformal coating / white**

*At normal operation of 5-meter fan
**At max speed of 5-meter fan



> We have reduced the air volume settings on our ventilation system with 33% since installing the fans. And on average we've saved 30% on our energy consumption so far. I've been in this industry for many years - and I can only see that you can win by installing these fans.

Jorgen Vienberg
Building Technician,
Gladsaxe Aquatic Center
Copenhagen

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NORTHERN LIGHT®
PRO

ELIMINATES AIRBORNE VIRUSES & BACTERIA INCL. CORONAVIRUS

DISINFECTION OF AIR

> The key is to move the air up above the blades of the fan. Here it will be exposed to UV light and when a certain amount of light has hit an organism with a certain intensity, the organism cannot reproduce and it will die.
>
> **Ole Grønborg**
> Ph.D, Founder & Director
> Ultraaqua A/S

DISINFECTION AND DISTRIBUTION OF CLEAN AIR

The Northern Light® product line consists of patented HVLS fans with integrated UVC light on the upper side of the blades. Slowly and silently, the air in a room is circulated and huge volumes of air pass over the integrated UV lamps in the wings. This way, the air is disinfected, as harmful airborne viruses and bacteria are eliminated when they are exposed to the UVC light.

DISINFECTION

For more than 70 years, UVC light has been used to effectively disinfect air. The light deactivates the ability of pathogens to replicate and thus their ability to infect.

CLEAN AIR

The system effectively eliminates airborne pathogens such as viruses, bacteria and fungal spores. Northern Light is able to generate up to 18,500 m^3 of disinfected air/hour.

ENERGY & INDOOR CLIMATE

The Northern Light® Pro series still has the same advantages as Northern Air®, which includes energy savings and a better indoor climate.

TESTED ON LIVE VIRUS

The system has been tested by the Danish Technological Institute in a test chamber using live virus. According to the test report, Northern Light® is the most effective system for disinfecting and distributing large volumes of air that can be used while people are present in a room.

Diameter	**2-5 meters**
Power consumption*	**50 W**
Clean air	**18.500 m^3/h**
Coverage area	**1000 m^2**
UVC wavelength	**254 nm**
Motor	**Direct Drive**
Max airflow	**23 - 75.000 m^3/h**
Virus-test	**Eliminates 87,9% of Coronavirus**

*At normal operation

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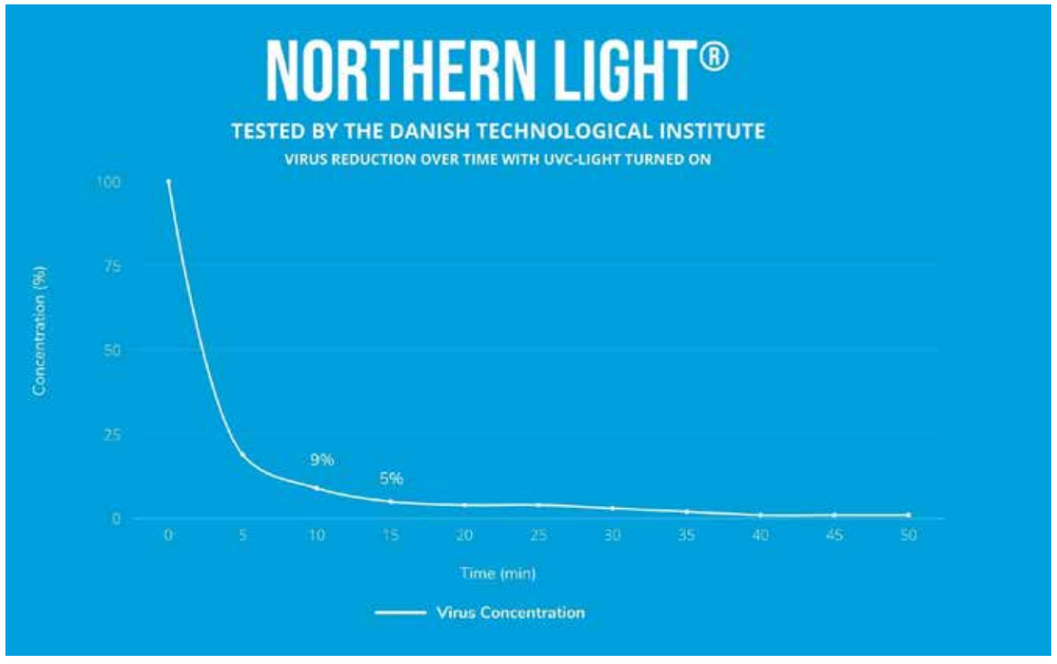
BETTER INDOOR CLIMATE WITH CLEAN AIR

- Northern Light® has the same advantages as Northern Air® systems
- Verified by the Danish Technological Institute based on tests with live viruses
- Generates up to 18,500 m^3 of disinfected air per hour (tested with coronavirus*)
- Northern Light® complies with EU directives
- Eliminates 87.9% of coronavirus* per passing, modeled by COMSOL CFD analysis



The Danish Technological Institute has carried out an extensive test of Northern Light to analyze the system's ability to disinfect air. The test was carried out with live virus in microdroplet form in a closed test chamber.

The results show a significant reduction of the virus concentration in the room when The UVC light is switched on. Specifically, the virus concentration is down to just 5% after 15 minutes. The Northern Light® system is therefore referred to as the most efficient system for disinfection and distribution of large volumes of air.

* SARS-CoV-2

Tested and verified by TEKNOLOGISK INSTITUT

BACKGROUND KNOWLEDGE

Leading universities have demonstrated that UVC light can kill more than 99% of airborne coronavirus microdroplets*. The combination of HVLS technology and UVC light thus provides a unique and effective way to fight airborne viruses and bacteria.

* Columbia University - Irving Medical Center

THE HISTORY OF UVC

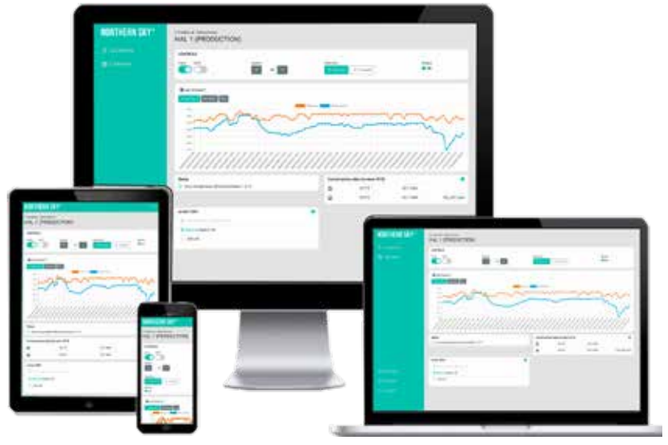
- In 1903, the Danish doctor Niels Finsen received the Nobel Prize in Medicine for using UVC light against tuberculosis.
- UVC light has been used for decades to disinfect water, among other things.
- In 2021 the CDCP (Centers for Disease Control and Prevention) recommended the use of UVC light, as one of the most effective technologies to minimize the spread of microorganisms in the air, e.g. also new coronavirus.

FACTS

- UV light is divided into three categories: UVA, UVB and UVC.
- UVC has a wavelength between 200 and 280 nanometers and is the most effective disinfectant radiation in the UV spectrum. These wavelengths target the DNA of microorganisms, destroying the cells and thus preventing replication.
- The uplight design makes it possible to have Northern Light® HVLS fans safely operating while people are present in the room.

CONTROL & MONITORING

NORTHERN SKY®



Northern Sky® is an online fan management platform that gives you full overview of fan operations and indoor climate data. It can be accessed via from desktop, tablet and mobile. From here, all fans can be monitored and controlled. Specific operating settings can be adjusted manually or set to automatic re-occuring calendar schedules that suit your facilities' needs.

THE MOST FLEXIBLE CONTROL SYSTEM

Thanks to the IoT module, fans can be controlled - even if they're located miles apart at different facilities. Start/stop, speed, rotational direction. It's all gathered in one place. In Northern Sky®, you can create specific operating settings for each zone in your building, exactly as you wish. The structure is intuitive and your settings are saved and synchronized automatically.

TAKE CONTROL OF YOUR AIR

With Northern Sky® you get full control and actionable insights. You collect indoor climate data effortlessly. Use it for example to keep an eye on whether you are optimized for enegy efficiency or if there are energy savings you are missing out on.

Your data is presented visually and intuitively, so you can easily track the parameters that interest you the most. E.g. this could be the temperature difference between floor and ceiling and whether there is accumulated heat under the ceiling that is being wasted. With a click you can translate your knowledge into concrete action by adjusting fan operations.

OTHER CONTROL OPTIONS

- INTEGRATING TO A BUILDING MANAGEMENT SYSTEM

- NORDICCO® HMI CONTROLLER

The NORDICCO® HMI Controller is a simple, hard-wired and easy-to-use controller. It comes with 10 different speed settings, reverse/forward mode and a networking functionality that allows the user to manage up to 10 NORDICCO® HVLS fans.

CUSTOMER REFERENCES

PUBLIC INSTITUTIONS

Aalborg Kommune
Randers Kommune
HELSINGØR KOMMUNE
ODENSE KOMMUNE
Vejen KOMMUNE
vejle KOMMUNE
norddjurs
Holbæk Kommune
KALUNDBORG KOMMUNE

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AALBORG LUFTHAVN | AIRPORT
SIEMENS Gamesa RENEWABLE ENERGY

EDUCATIONAL INSTITUTIONS

CBS COPENHAGEN BUSINESS SCHOOL HANDELSHØJSKOLEN
DTU Technical University of Denmark
UCL Erhvervsakademi og Professionshøjskole
CAMPUS VEJLE
SYDDANSK ERHVERVSSKOLE

CONTACT

If you want to learn even more about our solutions or want an assessment of your specific facilities, don't hesitate to contact us

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CO2 NEUTRAL TRYKSAG

NORDIC SWAN ECOLABEL