

iQ Star Wega/Wega Power/Nova
Energy efficient chilled beams



iQ
Star
by Fläkt Woods

FläktWoods

Top air quality with minimum energy consumption – today's basic requirements for modern buildings



When we enter a modern building today we expect nothing but perfect indoor air quality. In fact anything below par will be noted; it can't be too warm, nor too cold. Not too dry, nor too damp. Obviously without annoying smells or noises, and with oxygen levels like a walk in the park. That's the human side of it.

In the other end ever higher demands are put out for reduced energy consumption. Legislation and building regulations are more and

more stringent when it comes to environmental aspects. Meanwhile economical standards require both miniscule operational costs and a low long-term life cycle cost. Getting it right therefore includes being able to adapt to demands that change over time.

At Fläkt Woods we strive to meet these demands in our individual products as well as by integrating them in optimised systems. We do it both by gradually fine tuning every detail and by landmark innovations. Wega, Wega Power and Nova chilled beams are good examples of that quest.



Increased well-being means higher productivity

Today most people spend over 90% of their time indoors. That means indoor air quality is of ever growing importance. Not just for comfort reasons, but also because it is vital for us to perform to the best of our ability; to learn more at school, get well sooner in hospitals and be more productive at work.

Poor thermal comfort is perhaps the most noticeable problem. Too high temperatures make most of us drowsy. A couple of degrees is enough to have an effect. Dry and too cold air are also factors that cause discomfort that affects us. And the effects of too little oxygen in a crowded conference room is something many of us have experienced.

Correct temperature, humidity and an improved air quality can increase productivity by as much as 5 to 10%.

The perfect indoor climate is dependent on the correct combination of several factors:

- **Ventilation:** Supply of fresh air – without uncomfortable draughts
- **Temperature:** Via cooling, or heating, to the optimum levels
- **Humidity:** A proper balance for personal comfort and health
- **Air purity:** Dilution of CO₂ and filtration of harmful or irritating particulates
- **Noise:** No distractions from functioning systems

Demand Controlled Ventilation - energy efficient indoor climate



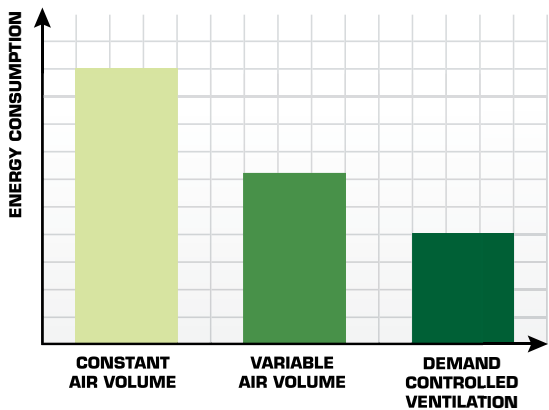
Breathing fresh indoor air
is vital for our health,
performance and well being

Fresh air could in fact be considered a basic human right. However, we also know that providing the necessary amount of fresh air to create a comfortable and healthy indoor climate consumes energy in terms of electrical fan power as well as cooling and heating energy. Energy that, when produced also has a negative impact on our environment and contributes to the CO₂-emissions to our atmosphere.

Experience and field studies have shown that the level of CO₂ in a room is a reliable indicator of the air quality and ventilation rate, and could therefore

be used as the determined parameter in Demand Controlled Ventilation systems. People are the main source of CO₂ in a building, if the number of people in a room are doubled, the CO₂-level will also double. If one, or a few people leave a room, the level of CO₂ will proportionally decrease.

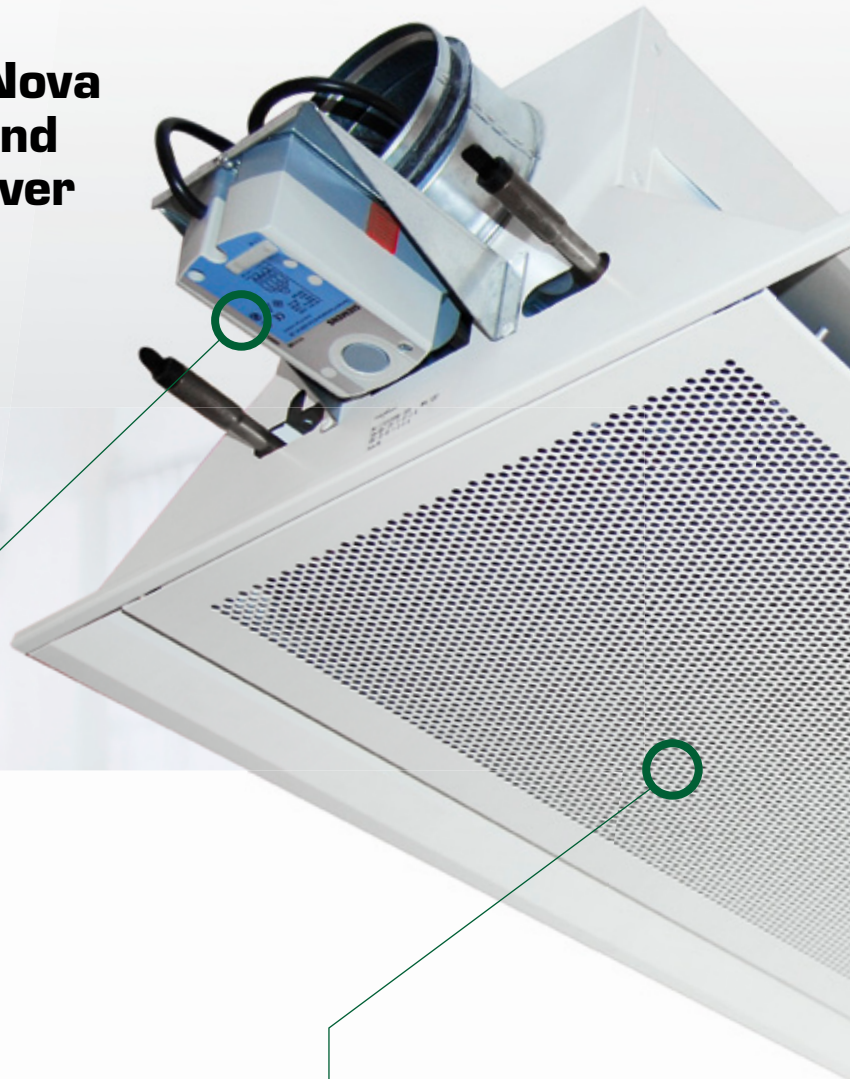




Reduce your ventilation costs with Demand Controlled Ventilation

Demand controlled ventilation provides desired ventilation based on the actual occupancy of the room. It increases indoor air quality and saves energy normally wasted in ventilating unoccupied spaces. This can be applied to areas where there are frequent changes in occupancy, such as conference rooms, board rooms, cafeterias etc. Field experience indicates that actual occupancy levels are at least 25% lower and perhaps as much as 60% lower. In normal office building the offices are not occupied more than 60% of the time during a normal working day. This means that demand controlled ventilation can reduce ventilation as well as heating and cooling loads by 10%–30%.

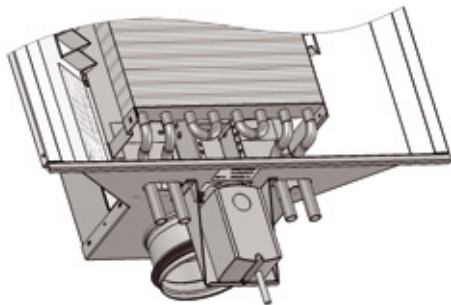
Wega/Wega Power/Nova – comfort, flexibility and energy savings whatever the installation



Demand Controlled Ventilation

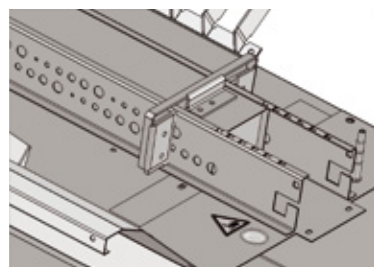
Motorized Energy Control System (Patented)

The actuator mounted on the induction system offers unique Variable Air Volume functionality to the Wega and Wega Power chilled beams. The airflow amount is controlled by a CO₂ sensor, an occupancy sensor or by the free-cooling signal.



Comfort & flexibility Energy Control System (Patented)

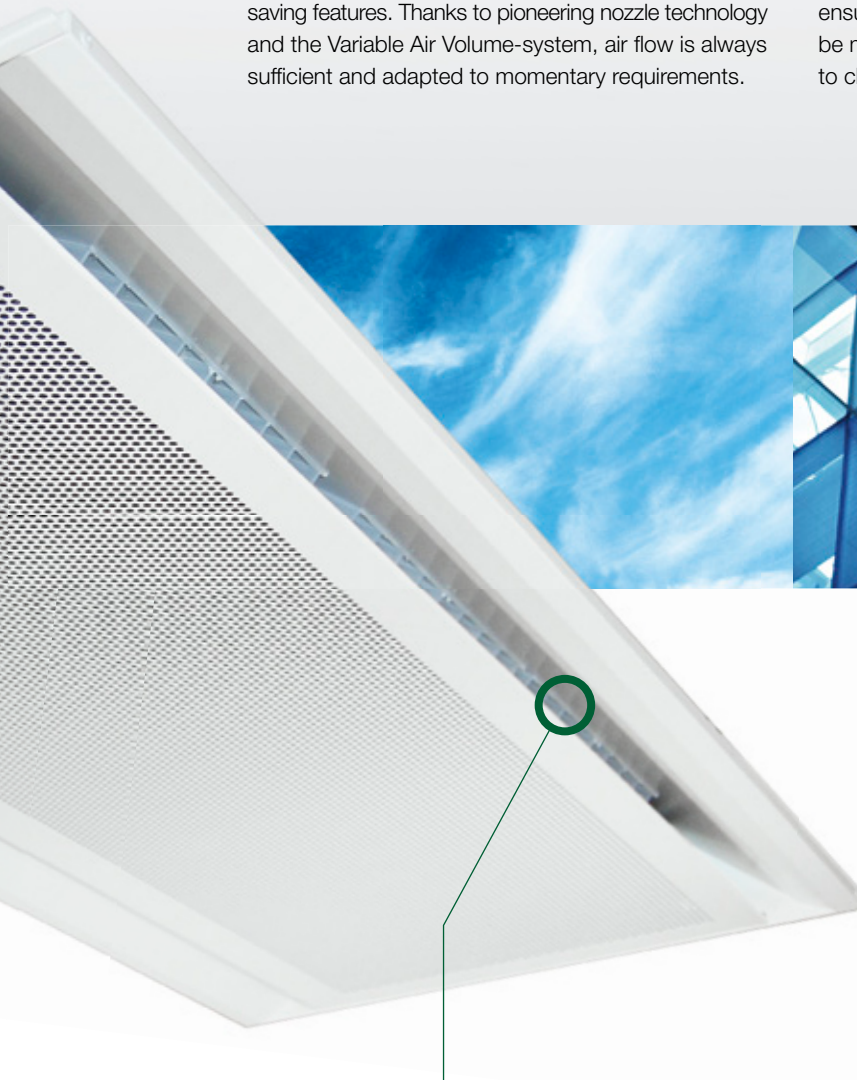
The new flexible nozzle arrangement guarantees high indoor air quality and energy efficiency. A quiet solution even when high air flow is needed. The configuration on site is easy and requires no specific tools (manual adjustment).



Fläkt Woods enhances the chilled beam system with unique features

Wega and Nova are developed specifically for the high demands of the modern and dynamic office, where flexibility is equally important as cutting-edge energy saving features. Thanks to pioneering nozzle technology and the Variable Air Volume-system, air flow is always sufficient and adapted to momentary requirements.

Beam modularity, the Flow Pattern Control and the Energy Control functions allow flexibility in the office layout. Good indoor air quality and human well-being are always ensured. Organizational changes and renovations can be made without the need to change the installation.

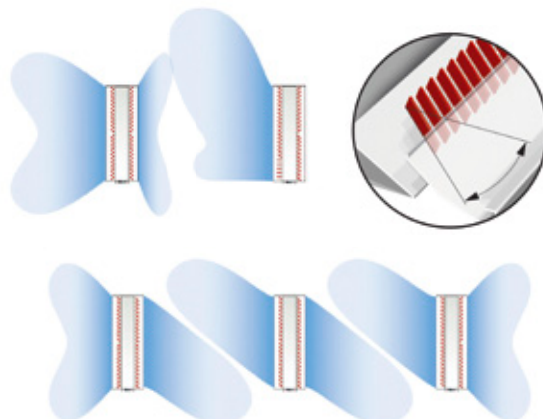


Fläkt Woods chilled beams system benefits:

- Comfortable indoor climate
- Good energy saving
- Low life cycle cost
- Fulfilment to Green Buildings requirements
- Demand Controlled Ventilation feature

Comfort & flexibility Flow Pattern Control system

Highest possible efficiency can be maintained by adjusting the comfort control and air vanes manually! A combination of different angles on one side is possible. When increased air flow is required, the flow pattern can be adapted to maintain optimal comfort in the room!



How to prepare for changing needs - without making any changes

The only constant in modern business is constant change. Being able to quickly adapt to change is today more of a necessity than a business advantage. Flexibility has therefore become a basic feature of office buildings. When business needs to change, offices must be able to follow.

Changes in organizational structure often call for rearrangement of people, walls and furniture. This means that the ventilation system has to have an inbuilt flexibility. It has to adapt to new space configurations, room functions and occupancy levels with a minimum of effort and lead time. Re-configuration rather than re-installation, that's our answer.



Before
(old office configuration)

After
(new office configuration)

Flexibility in the office layout

Good indoor air quality is possible despite organizational changes and renovations without the need to change the installation. Thanks to the functions Energy Control and Flow Pattern Control, the air flow can be rearranged to fit a new layout of a room.

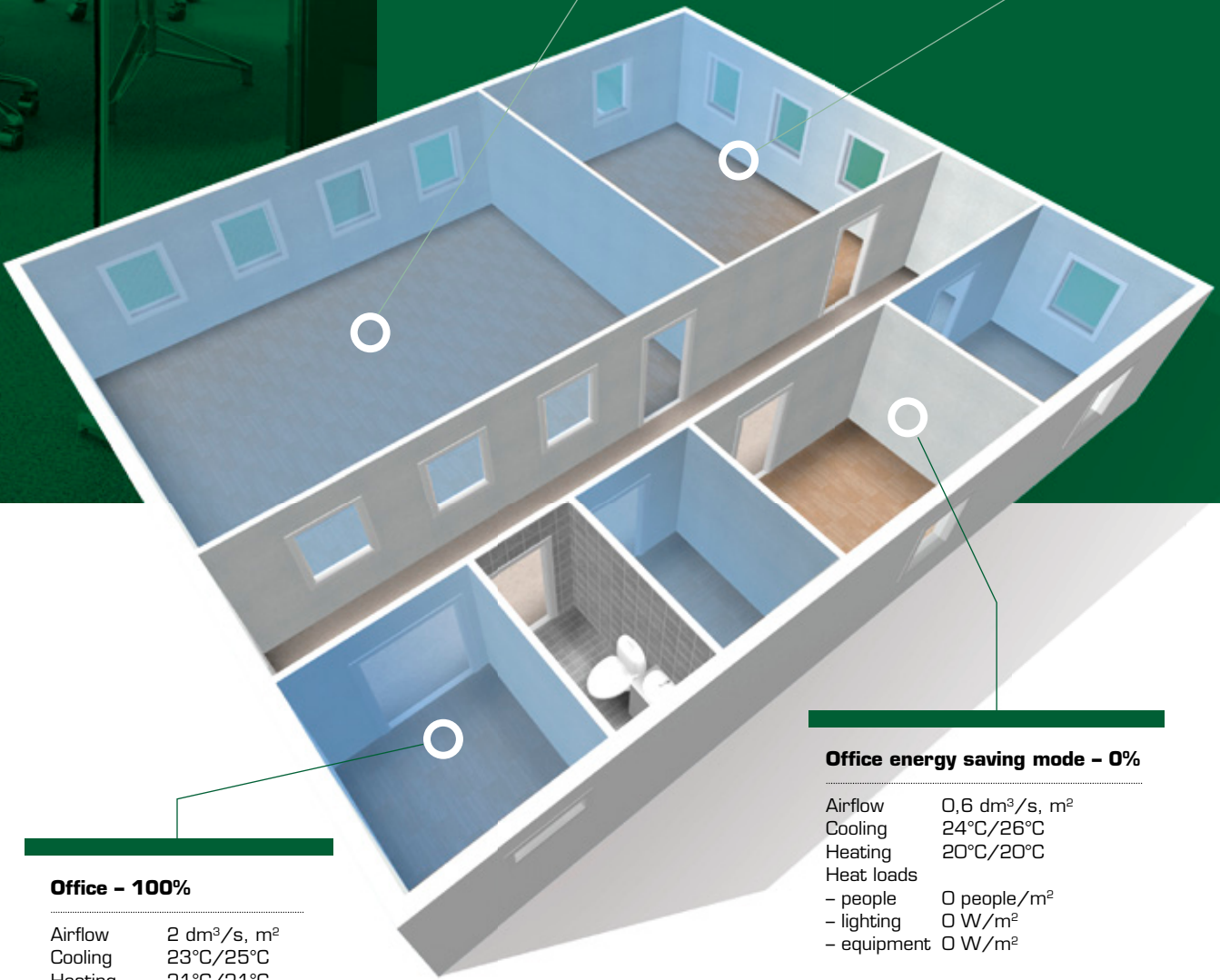


Open plan office – 100%

Airflow 2,0 dm³/s, m²
 Cooling 23°C/25°C
 Heating 21°C/21°C
 Heat loads Mo–Fr 08–16
 – people 0,11 people/m²
 – lighting 12,5 W/m²
 – equipment 16,0 W/m²

Open plan office – 50%

Airflow 1,0 dm³/s, m²
 Cooling 23°C/25°C
 Heating 21°C/21°C
 Heat loads Mo–Fr 08–16
 – people 0,055 people/m²
 – lighting 12,5 W/m²
 – equipment 8,0 W/m²

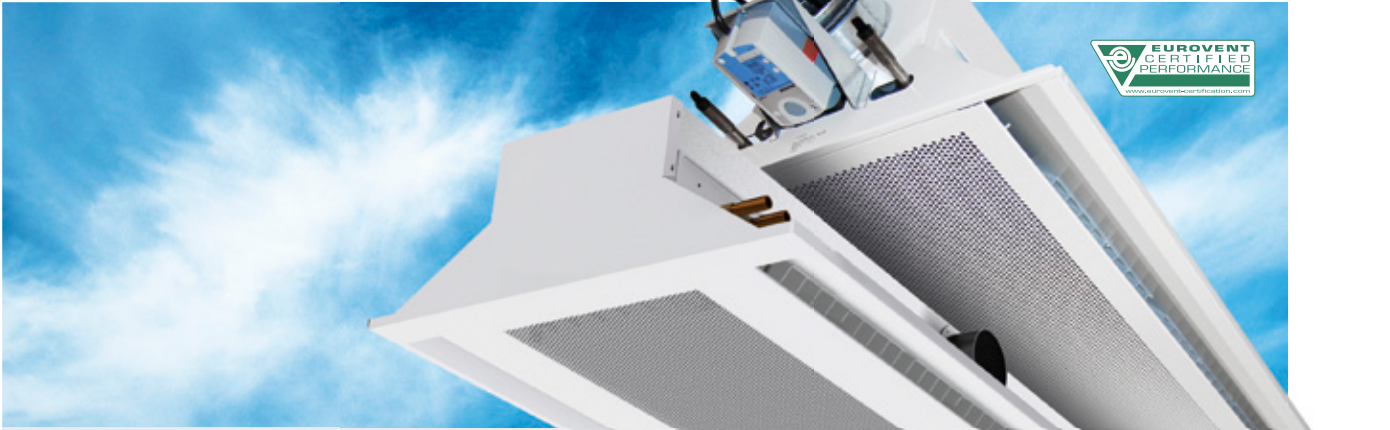


Office – 100%

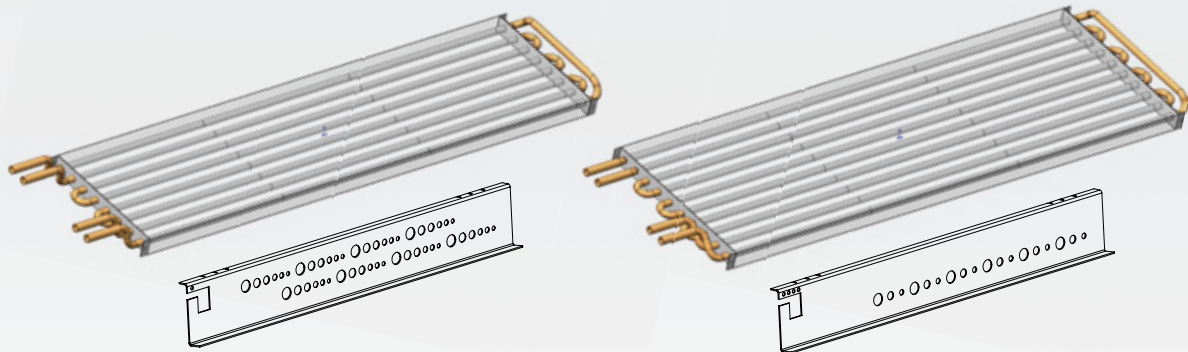
Airflow 2 dm³/s, m²
 Cooling 23°C/25°C
 Heating 21°C/21°C
 Heat loads Mo–Fr 08–16
 – people 0,1 people/m²
 – lighting 12,5 W/m²
 – equipment 15,0 W/m²

Office energy saving mode – 0%

Airflow 0,6 dm³/s, m²
 Cooling 24°C/26°C
 Heating 20°C/20°C
 Heat loads
 – people 0 people/m²
 – lighting 0 W/m²
 – equipment 0 W/m²



Wega and Wega Power – flexible construction and wide specification



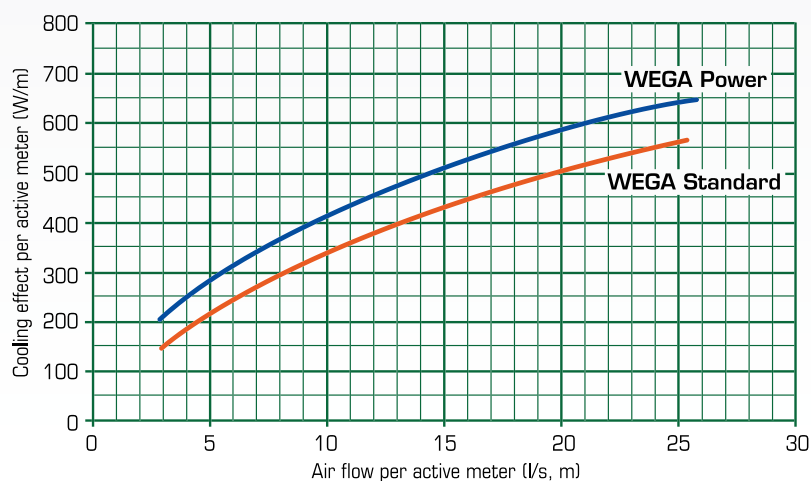
Wega for high flexibility

- 8 rows coil: 2 pipes (cooling) or 4 pipes (cooling and heating)
- 6 different nozzle configurations available on site
- 12 different nozzle configurations available for selection

Wega for high capacity

- 10 rows coil: 2 pipes (cooling) or 4 pipes (cooling and heating)
- 3 different nozzle configurations available on site
- 12 different nozzle configurations available for selection

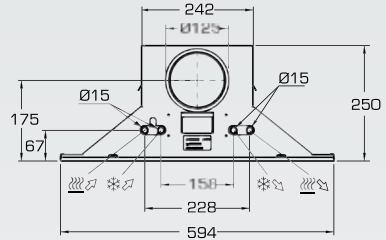
Quick selection iQ Star Wega and Wega Power chilled beam



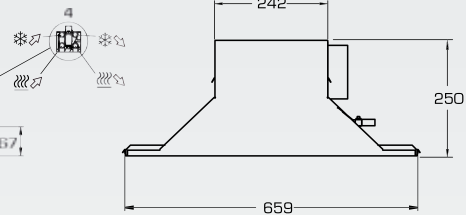
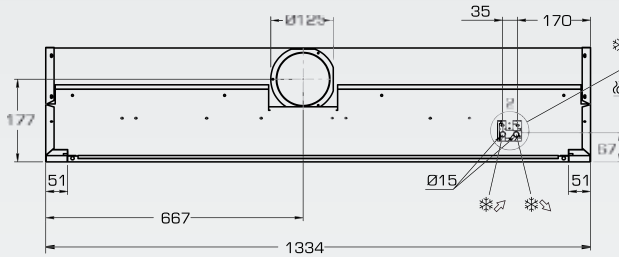
The diagram shows the total cooling effect per active meter at a total pressure of 70 Pa, water flow $q_w = 0,05$ l/s, temperature difference between room air and supply air $\Delta t = 8^\circ\text{C}$ and temperature difference between mean water temperature and room temperature $\Delta t = 8^\circ\text{C}$.

Several dimensions to adapt airflows and space in false-ceiling

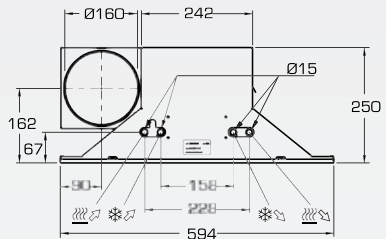
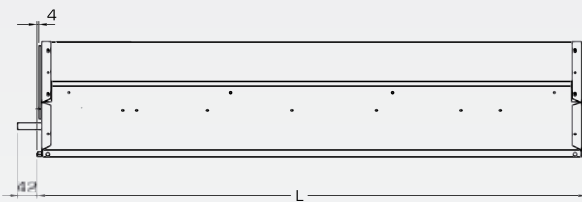
IQIF/IQIH-aaa-11-cc-d-e / IQIF/IQIH-aaa-13-cc-d-e



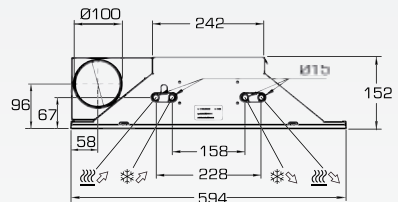
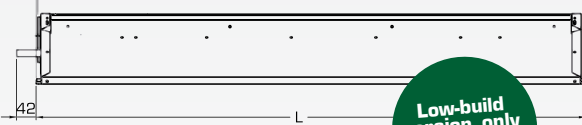
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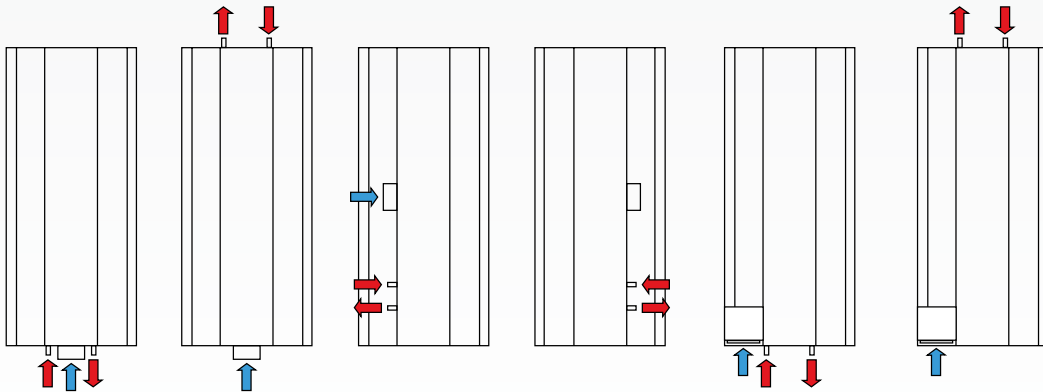
IQIF/IQIH-aaa-71-cc-d-e / IQIF/IQIH-aaa-73-cc-d-e
(aaa = 120, 180, 240)



aaa	120	180	240	300
L	1194	1794	2394	2994

Low-build version, only 152 mm

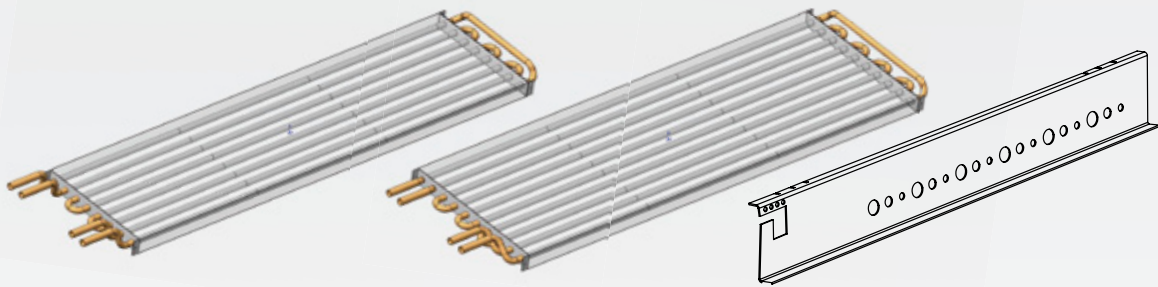
Wide choice of connections (water and air) to fit whatever the layout design



➡ Air connection ➡ Water connection



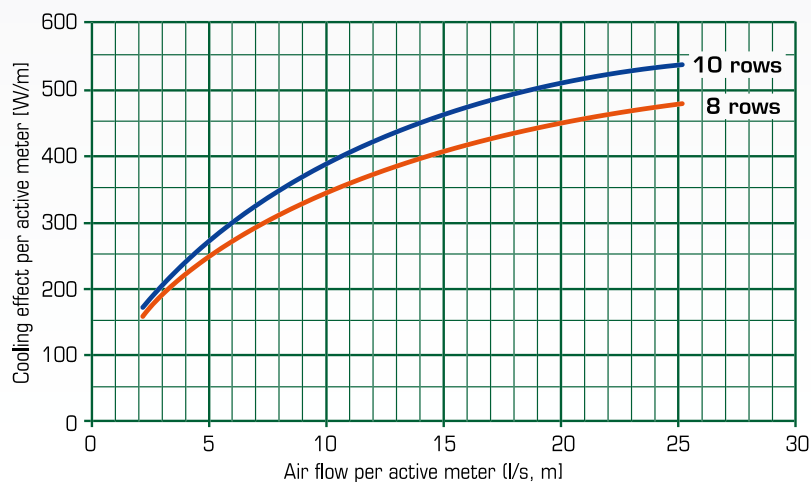
Nova – innovation in a free-hanging installation, design and efficiency combined



Nova – flexible with powerful configurations

- 8 rows coil or 10 rows coil
- 2 pipes (cooling) or 4 pipes version (cooling and heating)
- 6 different nozzle configurations available on site
- 12 different nozzle configurations available for selection

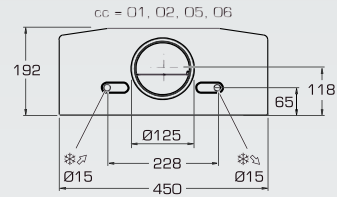
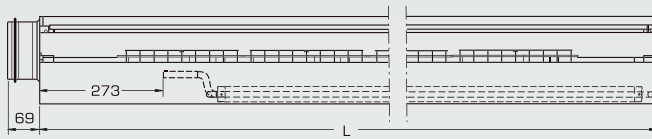
Quick selection iQ Star Nova chilled beam



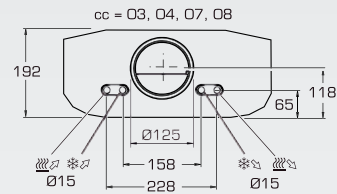
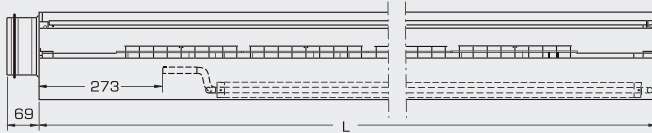
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Choice of designs to integrate Nova in your environment

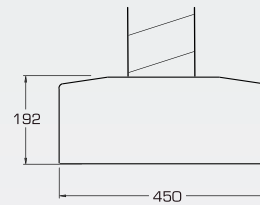
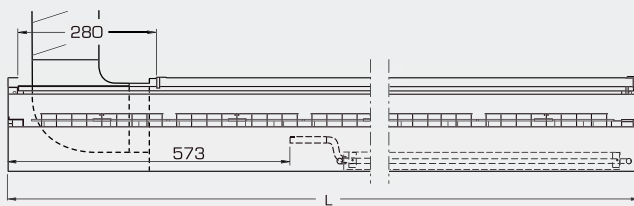
IQFH-aaa-11-cc-d



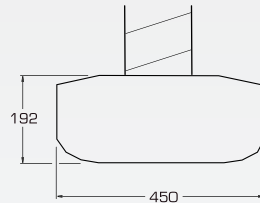
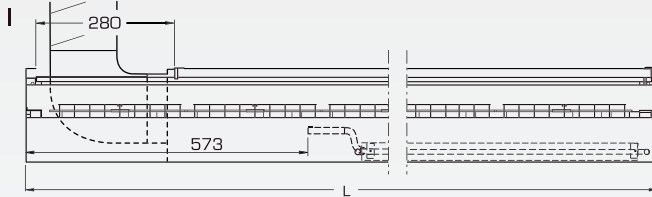
IQFH-aaa-21-cc-d



IQFH-aaa-13-cc-d



QFH-aaa-23-cc-d

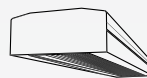


IQFH-aaa-11/21

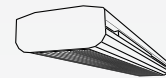
aaa	090	120	150	180	210	240	270	300
L	1200	1500	1800	2100	2400	2700	3000	3300

IQFH-aaa-13/23

aaa	090	120	150	180	210	240	270
L	1500	1800	2100	2400	2700	3000	3300

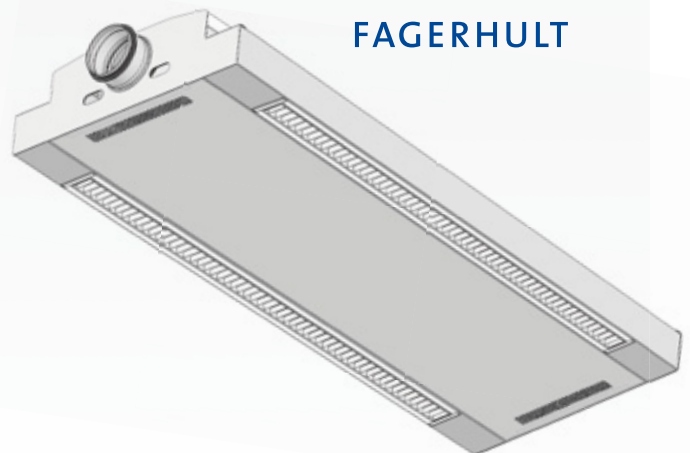
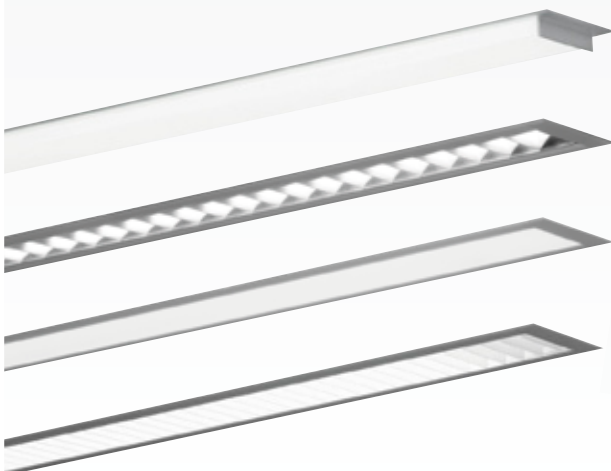


bb=11, 13



bb=21, 23

Wide range of light fittings to suit your requirements



FAGERHULT



Take control of the unique features of Wega and Nova

The STRA-14 room controller is specifically developed for Wega and Nova beams. It is preprogrammed for chilled beam applications and contains a wide range of control functions including a unique **six or three steps air flow control** for flexibility and **the free-cooling functionality** to ensure comfort and energy efficiency.

The user-friendly display enables fast and easy access for change of set-points and control parameters. For optional integration with building management systems, STRA-14 has Bacnet communication and Modbus communication as standard.

For rooms with variations in occupancy, the optional occupancy sensor enables a control strategy where the controller is in Energy saving mode (reduced air flow and increased neutral zone for heating and cooling) when the room is unoccupied and thereby energy is saved. When the occupancy sensor is activated by presence in the room, the controller shifts to Normal mode and controls airflow, heating and cooling for comfort.

Experience has shown that the level of CO₂ in a room is a reliable indicator of the indoor air quality, and is therefore used as the determining parameter in

the integrated Energy Control. A high level of CO₂ in a room indicates that the ventilation rate is insufficient to obtain an adequate indoor quality. Therefore STRA-14 can be equipped with an optional CO₂-sensor and thereby offer a control function where the controller opens step by step the primary air (six or three positions control mode) or shifts to Boost mode if the level of CO₂ exceeds the set point value.

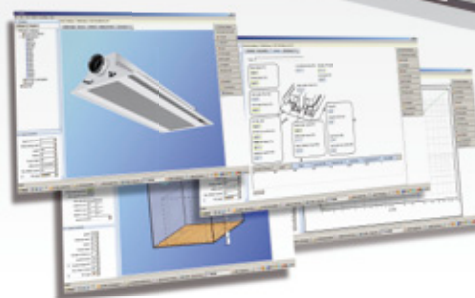
The built in operator button on can also be used to activate the bypass mode, after 60 minutes (configurable) the controller then change back to its preset operating mode.

Product selection tool for chilled beams

ExSelAir is Fläkt Woods' web based product selection tool for calculation and documentation. The tool shows all products, functions and features visually, which makes it very easy to use. www.flaktwoods.com/exselair

ExSelAir contains:

- 3D presentation of all products
- 3D presentations of the flow patterns in selected rooms
- A calculation and dimensioning tool
- Installation and maintenance manuals
- Connections with MagiCad or Revit (plugin or database)





Pressure-dependent system for ensuring Demand Controlled Ventilation

The airflow through the chilled beam is depending on the static pressure upstream the unit. Thus the change in the air flow at one device must not impact and affect other parts of the system. Therefore it is necessary to keep constant the static pressure in the ductwork. Pressure controllers EMPA/D will be installed to ensure this function.

Ductwork design

The static pressure difference in the branch must be minimized therefore it is advised to use the static pressure regain method to design the ductwork. The duct size is calculated for the lowest possible pressure drop.

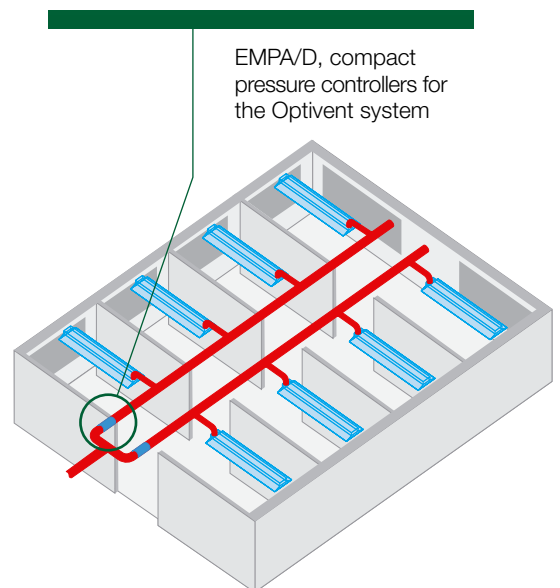
More this method leads to avoid an excessively high pressure in the ducting system. Hence the noise

level is reduced and energy consumption of fan is saved.

Air handling unit

The central unit will be designed to handle variable air volume into the buildings. A pressure sensor located in the main branch of the ductwork will control the frequency converter of the fans.

Irregular use of certain rooms, e.g. conference and employee break rooms, will affect the synchronism of the system and with it the design flow. Other factors which may affect this are absences on business, absences through illness and holidays. By taking these factors into account, the design max flow can be selected at a value below the sum of the combined sub-flows.



Twin Wheel system, the perfect companion to chilled beams

In temperate climate (Europe), the Twin Wheel system has a big impact on the cooling coil capacity and reduces it significantly. Thus the life cycle cost of the building is reduced compared to the traditional systems. In humid climate (Asia and US) the Twin Wheel system gives the opportunity to design chilled beams system with energy efficiency whilst controlling the humidity of the indoor air climate to avoid risk of condensation.

The Twin Wheels controller operates rotors and cooling coils in sequence to a dew set-point value, thereby limiting the supply air humidity level whilst maintaining a precisely matched indoor air quality. Good humidity control helps to eliminate the risk of condensation, ideal for chilled beams application.



Total Energy Recovery Wheel

The Total Energy Recovery wheel reduces temperature of the incoming air (sensible loads). Simultaneously it transfers moisture from the inbound to the outbound air flows (latent loads).



Cooling coil

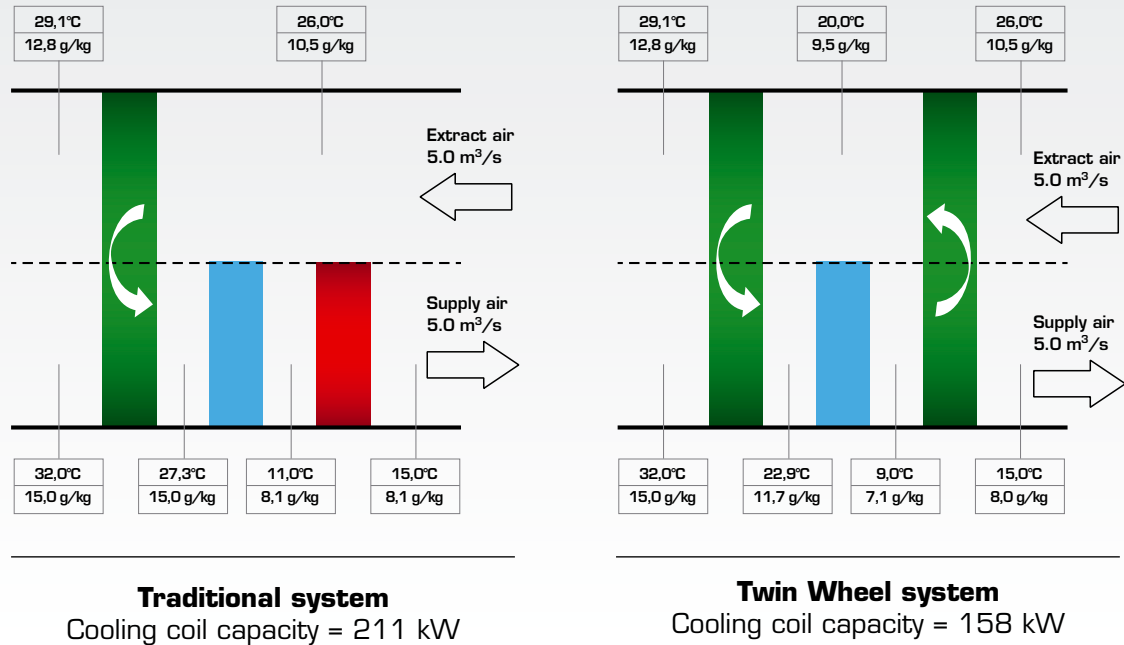
After passing through Total Energy Recovery Wheel the air passes through the cooling coil, where the temperature is reduced further and moisture is condensed down to required levels. Since the air has already been cooled by the hygroscopic rotor, the demand for cooling is lowered.



Sensible or passive dehumidification wheel

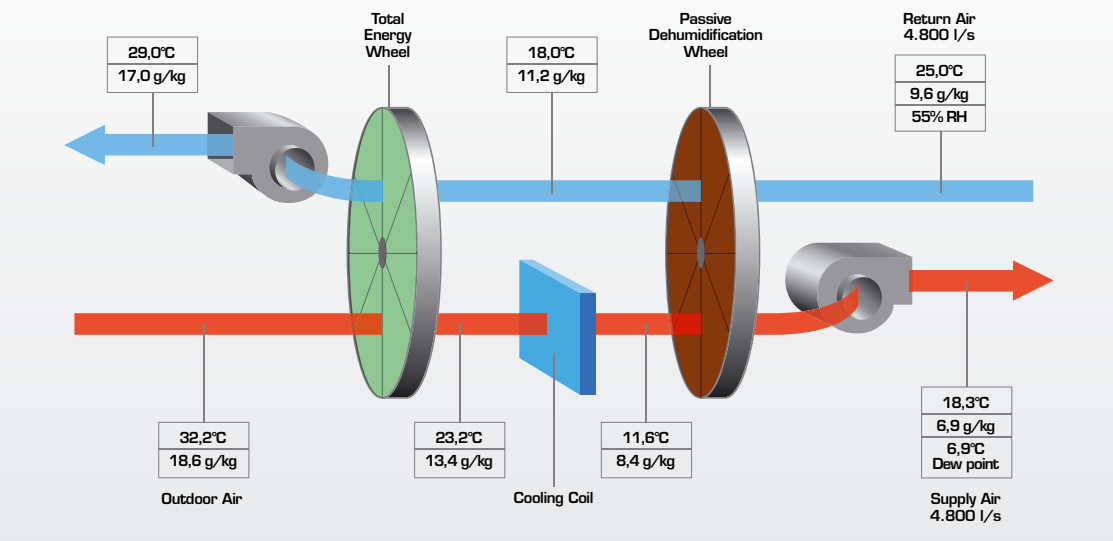
The now dehumidified and cooled air continues to the sensible rotor, where heat from exhaust air is recovered and used to re-heat the supply air. In humid climate this 2nd wheel is a passive dehumidification wheel to reduce further humidity of the primary air.

Facts: Twin Wheel system with sorption wheel compared to traditional system



Cooling coil reduction = -25% and no reheat required with Twin Wheel

Facts: Pinnacle system, Twin Wheel with passive dehumidification wheel in humid climate



The Pinnacle system achieves the required humidity level for chilled beams despite high amount of humidity in the outdoor air.

Fläkt Woods – the system specialists

A carefully designed system can achieve more than the sum of the integral parts. High-performing components are an obvious starting point. But it is by combining products into a system, utilizing smart controls, one can achieve the best energy solutions. This strategy requires that the systems and individual components are designed together. It takes thorough knowledge of the individual products impact on each other and the ultimate combined effect to reach perfection. Fläkt Woods develop and produce components as well as design systems. That's why we can combine the parts into harmonic overall solutions.

Econet



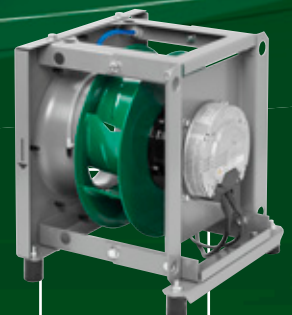
Air handling units



Smart cooling distribution

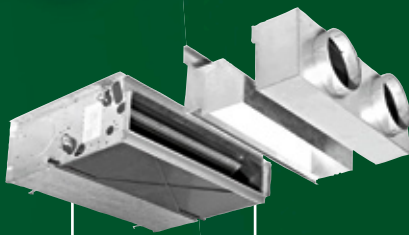


Variable fans





Controlling the system



Fan coils



Air terminal device and control of airflow



Save Energy, Economy and Environment with Fläkt Woods

Energy optimization is an important aspect of ventilation, where Fläkt Woods have acclaimed expertise. We use e³ to highlight products and solutions that are particularly effective. They serve a dual purpose of saving both your long-term economy and our environment.

www.flaktwoods.com/energy

We Bring Air to Life

Fläkt Woods is a global leader in air management. We specialize in the design and manufacture of a wide range of air climate and air movement solutions.

Our collective experience is unrivalled. We are constantly aiming to provide systems that precisely deliver required function and performance as well as maximum energy efficiency.



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