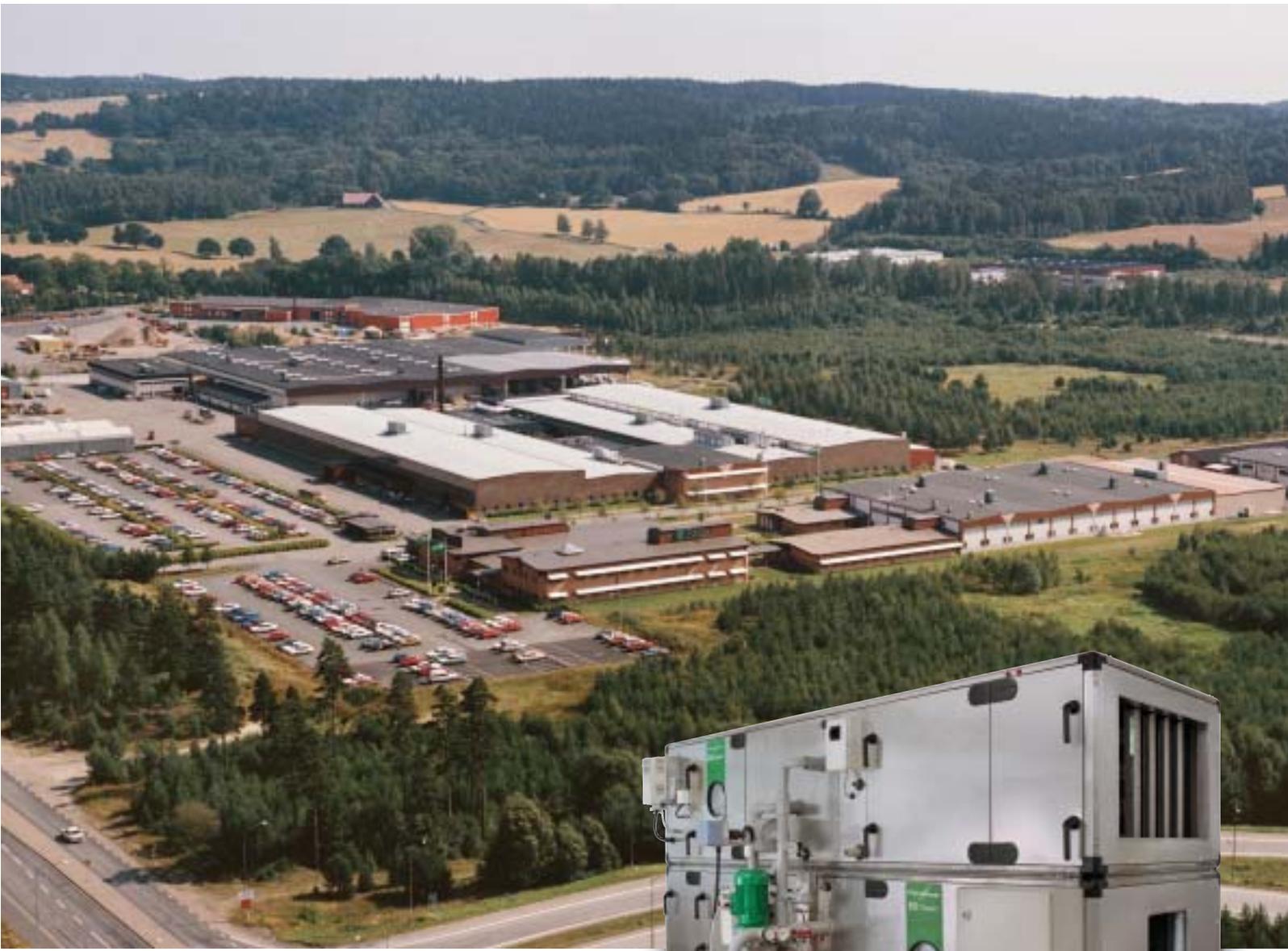


EU and EC air handling units
Good indoor comfort anywhere in the world



Fläkt

FläktWoods



Fläkt Woods has extensive knowledge and vast experience. We have produced air handling units since 1937.

Unlike most of its competitors, Fläkt Woods is more than merely an assembler of air handling units. The main components are designed and manufactured by us specifically for our air handling units. We control the quality and the performance. We ensure that the quality and performance are optimized to give the best possible performance over the lifetime of the unit.

The units and all components are designed, tested and produced by Fläkt Woods to applicable standards including ISO 9001 (quality assurance), ISO 14001 and EMAS (environmental management).

Technical performance is generally in accordance with CEN standards and the EU and EC air handling units are certified by EUROVENT.

AHUs for demanding customers

EU and EC are a series of units from Fläkt Woods for those requiring tailored and quality packed solutions. The wide range gives you the perfect opportunity to find the ideal solution. You can easily combine sizes with the functions you need. Naturally we have integrated the know-how and quality demanded for an energy efficient and reliable installation.

Turnkey or custom-made

You will easily find the required sizes and functions in the EU and EC series, from the most basic functions to the latest technical advances within the industry, from the smallest unit sizes to the very largest that provide the right air volume and quality for just about any application from cutting-edge process industries to basic comfort ventilation systems e.g. cutting-edge industries and shopping centres. The modular range is easily adapted to meet customer specific demands.

We never lower our standards of reliability and energy efficiency, irrespective of the complexity of the air handling units.

Solutions for demanding environments

Coastal climates or inland climates, apartment blocks or corrosive industrial environments Fläkt Woods always offers the right materials for each situation. The outer casing and components are available in the materials demanded for your customer's specific environment.

Operating costs

The aim of Fläkt Woods is to design for a good environment, a good indoor climate as well as low operating costs. Consequently, all our designs are carefully engineered to give optimal energy solutions for a low SFP-figure and low life cycle cost (LCC).



“The aim of Fläkt Woods is to design for a good environment, a good indoor climate as well as low operating costs.”



Complete system solutions

» Fläkt Woods has more than 80 years of experience of systemised thinking. This is reflected in our approach and benefits each and every one of our customers.

Fläkt Woods has control over all ventilation components from the air inlet grille to the diffuser in the room. This unique knowledge contributes to a quick installation and small system losses. Resulting in very low life cycle costs.

Heat recovery systems reduce your operating costs

Fläkt Woods is a world leader in heat recovery systems for HVAC applications. We have been researching and developing these systems for over 30 years and continue to do so. Demands differ between applications and we will offer the right system for your application.

In addition to the well-known systems *Regoterm*[®], *Recuterm*[®] and *Ecoterm*[®] we have now expanded by adding yet another system, *Econet*[®].

Econet[®] gives you more

Econet[®] is a further development of the coil recovery system *Ecoterm*[®]. The system handles heat recovery, heating and cooling in a single closed circuit. Exceptionally low temperature

requirements for hot water make it possible to utilise alternative heating energy sources.

Econet[®] units can be significantly shorter than conventional air handling units as only one coil circuit is needed.

Nature's own cooling built-in

As an element in Fläkt Woods' environmental thinking we use a natural evaporative cooling process to obtain the right comfort environment when exacting demands are made.

The process is completely environment friendly without any discharge that can impact on the outdoor environment. All that is needed is an evaporative humidifier in combination with an efficient heat recovery unit.

When natural cooling is not enough

Sometimes nature needs a helping hand.

Natural cooling is not always sufficient and must be supplemented with conventional cooling. In order to make it as easy and reliable as possible we incorporated a complete turnkey cooling installation in the unit. Everything is installed and tested at the factory.



CoolMaster[®]
cooling system



Cooler
chilling unit





Air handling with technology in the centre

» An advanced product selection program makes dimensioning and specifying easier than ever before.

The associated product selection program is an integrated part of the EU and EC air handling units. It quickly and easily selects the right unit size and type to meet the preferred specifications.

The program gives a complete technical specification with detailed dimensional sketches. Pressure drop, power consumption, efficiency, sound data, SFP-figure and LCC - cost calculations are calculated automatically and are presented on screen as well as on a printout. Even a 3D unit drawing can be transferred to AutoCAD.

Laboratory tested components

The Fläkt Woods laboratory is equipped to test the performance of fans, filters, heat recovery units and other components according to applicable standards.

EU and EC air handling units are certified according to the test and classification standard EUROVENT/CECOMAF 6/C/005/-1997 and have certificate number 99.03.008.

Certification comprises the testing of a standard unit in an independent laboratory chosen by EUROVENT. Measured data must correspond with catalogue data as well as data presented by the product selection program to obtain certification. The following data is checked:

- Flow, pressure, power consumption
- Sound power to ducts per octave band
- Sound to the surroundings per octave band
- Heating and cooling capacity
- Efficiency of the heat recovery unit
- Pressure drop on the water side

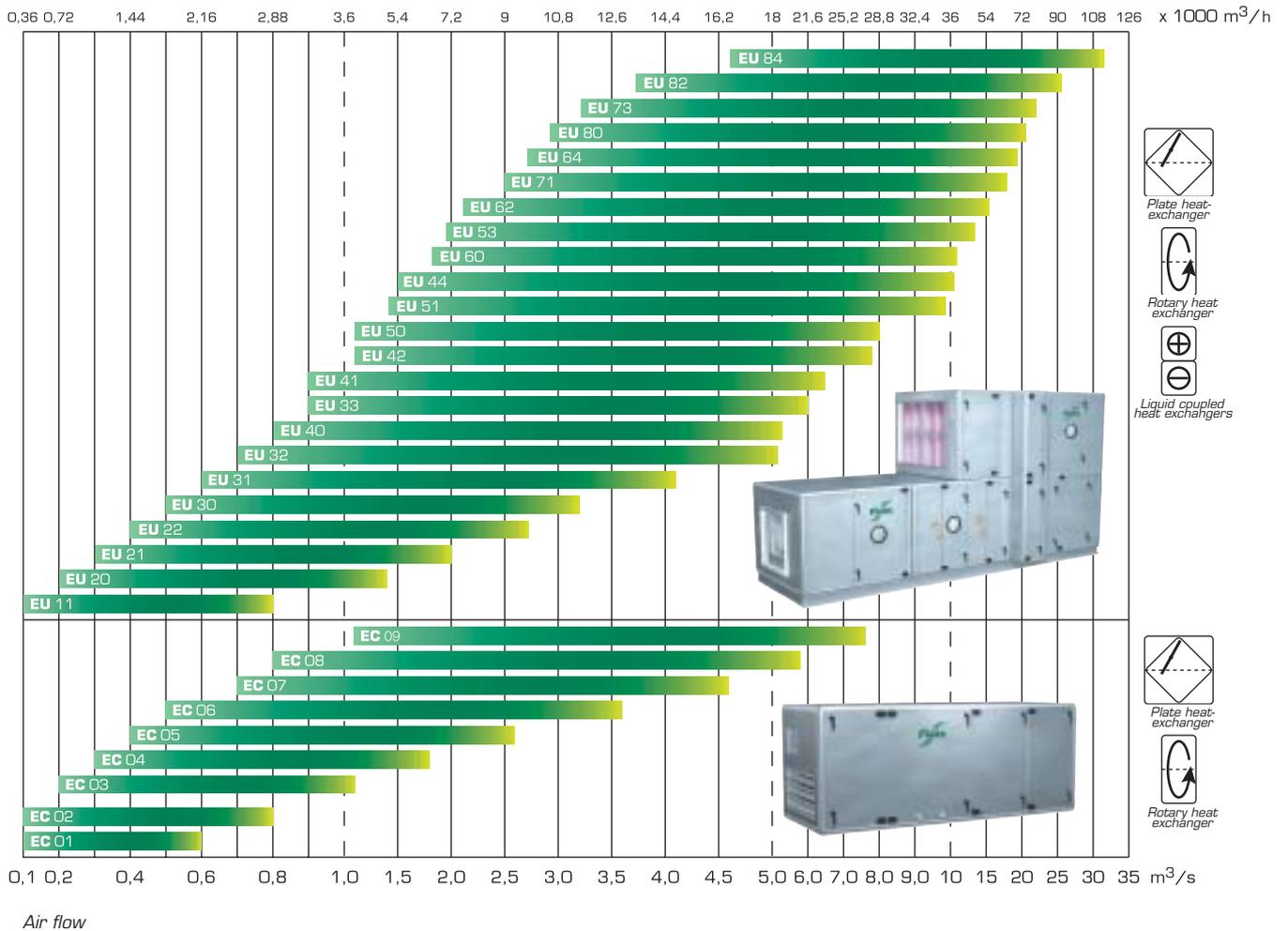
The following is included and tested as a supplement: mechanical strength, heat transfer, filter leakage and sound levels (according to the standard prEN 1886).



The Fläkt Woods laboratory is equipped to test everything from fans and filters to heat recovery units and complete systems.



A full selection of sizes covering a wide range of airflow



A robust casing platform

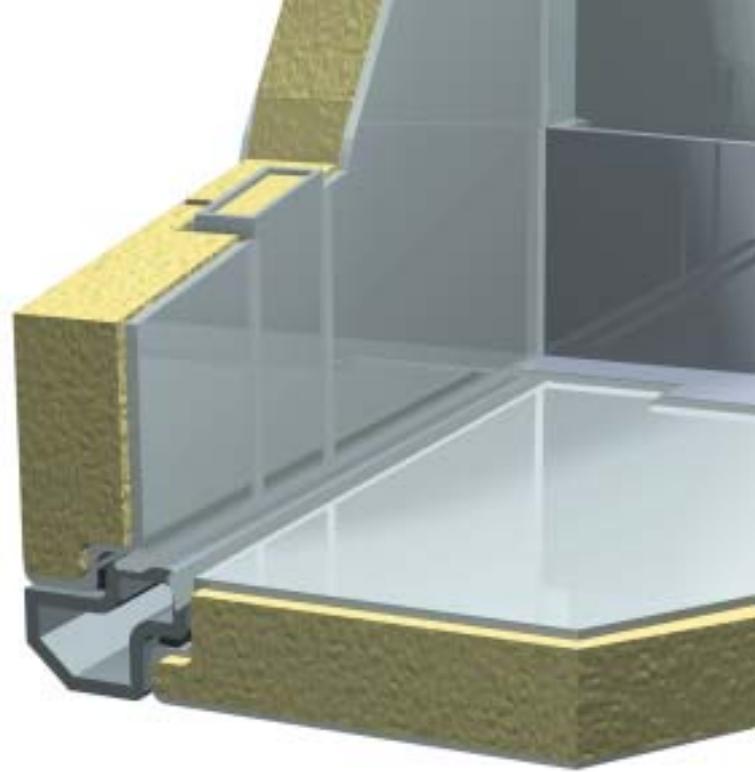
» The EU and EC-units are built on a common design platform, which means that you can choose between module or compact and get the same good casing specifications.

Same robust design

The casing is built on a framework of hollow section steel profiles bolted to sturdy corner pieces of aluminium or composite material. Double skinned panels form the cladding. The casing meets the performance requirements of the CEN standards. Apart from the normal galvanized finish, stainless steel or pre-coated steel are available options on the modular unit.

For outdoor units or units selected for CEN B leakage the joints between panel and frame are sealed.

A stable frame design of enclosed steel sections and corners made up of a composite material.



Security on every door

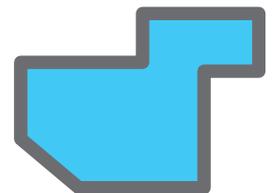
Each door is equipped with a lockable handle as standard. The handle is designed to avoid thermal bridges and leakage.

Environmentally safe insulation

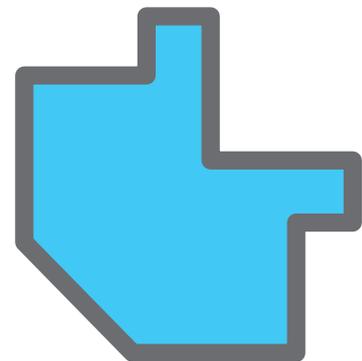
The EU and EC air handling units both use mineral wool as the casing insulation. Mineral wool, which is non-combustible, gives both high-quality acoustic insulation and excellent thermal insulation. The framework is also available with insulation.



Each door is equipped as standard with a lockable handle.



The frame section for the small units up to EU size 53 and all EC units.



Larger units are built on more robust frame sections for strength and stability.



Dampers and filters

» The filters play a very important role in the ventilation system. They both protect the system and make sure that the indoor environment satisfies the stipulated demands. Minimal leakage and service friendliness are two important features for the filter section.

Most EU and EC-units feature our new filter frame, which is designed to promote service friendliness and prevent leakage. The filter frames are withdrawable, which makes them easy to access for inspection and cleaning.

The filter section can be fitted with a drainage tray with a screen as an extra option. Of course there is a wide range of filter classes and materials available.

Carbon filter

In some applications it may be appropriate with an active carbon filter to reduce high odour concentrations. An active carbon filter absorbs gases and odours in the outdoor or exhaust air to protect and improve the indoor climate or to protect the environment.

Absolute filter

Absolute filters (HEPA) with extremely high separation capacity are installed in clean rooms, operating theatres and other hygienic ventilation applications. The mounting of the filter is extremely important, if the system is to conform to the stringent demands.

The EU unit series offers a reliable absolute filter section with a filter wall, which has a better leakage class than the actual filter.



The features filter frame makes it easier to access the filter for service and inspection.

Damper

A damper is used in the air handling units for shutoff and adjustment of the air flow. Our newly improved damper is designed for the Scandinavian climate, which demands reliable dampers with low leakage rates.

The damper is used to adjust, shutoff and mix air flows.



Heat exchanger for heating and cooling

» Our unit contains a Fläkt Woods heat exchanger to ensure good performance and quality.

Quality in production, and a very accurate and fully developed product selection program, means that you can trust the performance and reliability.

The coils are usually manufactured of copper pipe with aluminium fins, but fins are also available in copper or epoxy coated aluminium for applications where there is a greater risk of corrosion.

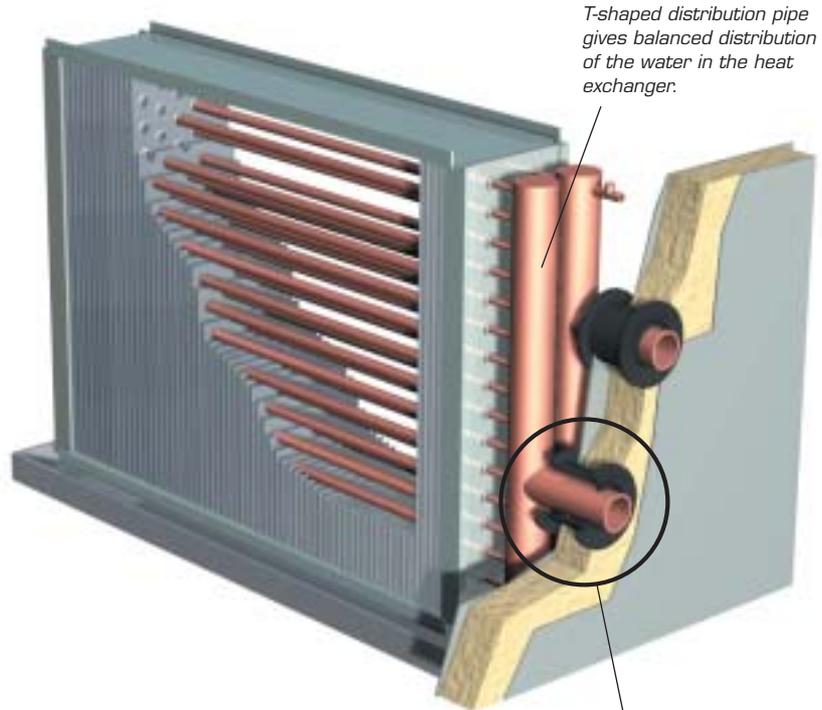
Inclined drainage tray

The heat exchanger for cooling is equipped with a stainless steel drainage tray that is angled towards the inspection side and a pipe extending out through the casing.

In addition, the larger sizes are equipped with an intermediate tray that is angled and connected to the floor tray via a hose approved for the food industry.

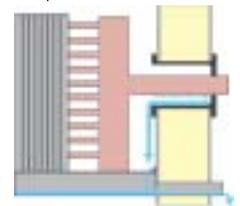
Sealed lead-throughs

All heat exchangers are equipped with nipples for venting and drainage and all connections enter the casing via a sleeve that both seals



T-shaped distribution pipe gives balanced distribution of the water in the heat exchanger.

the lead-through against air leakage as well as counteracts water penetrating the insulation.



The Fläkt Woods-developed pipe sleeve seals the lead-through against air leakage as well as water penetrating the insulation.



High quality heat exchanger.



Effective and hygienic water seal.

Fans at the heart of the system

» The fan is the heart of the air handling system. As experts in fan design we know how to install fans in air handling units.

The EU and EC units are equipped with fans manufactured by Fläkt Woods. We offer a wide range of fan models and accessories allowing you to choose the optimal solution for your specific installation.

The fans are tested and measured in our pressure chamber to the standard DIN 24166. They are driven by high quality and top performance motors, for example, motors from ABB.

Centrifugal fans

The most popular fans are belt driven centrifugal fans with backward curved blades. These fans offer high efficiency and flexible operation. The belt drive means the motor can run synchronously and we can then choose a motor close to the optimal power output.

Centrifugal fans with forward curved blades are the best alternative for small flows as these require very little space.

The belt drive consists of a standard V-belt with appropriate pulleys. Spare parts are readily available and adjustment is easy.



Flat belt drive for good economy and operating safety.

All bearings are designed for an estimated average life of 22 years at maximum speed and significantly greater at lower speeds.

An alternative is a flat belt drive which gives higher efficiency and a smaller service requirement. The larger bearings give a longer operating life than equivalent V-belt drives. Another advantage of the flat belt drive is that it does not give off any dust.

Plug fans

The plug fan has recently become popular. As it is direct driven it requires a minimum of service. It is easy to clean and has a low vibration level.

Many accessories to choose from Irrespective of which fan you choose a number of accessories can be chosen for safety and convenience. A frequency inverter ready connected and installed at the factory is just one example. Flow meter with instrumentation is another good example.



Low sound level. Fans and units are measured using a sound-level meter in our laboratory.



Highly efficient heat recovery

» The most suitable alternative is dependent on the conditions in each individual project.

Temperature efficiency is a good measurement to indicate the effectiveness of a heat recovery unit. The greater the efficiency, the more heat recovered. Nevertheless, you should not always aim for maximum efficiency.

Regoterm®

Regoterm® is the heat recovery unit that has the highest temperature efficiency, about 85 per cent and gives the greatest operating economy savings. It can also recover cold and moisture. A large, effective rotor area gives greater recovery. Laminar air flow gives a low pressure drop and low energy consumption.

Ecoterm®

In installations where the risk of leakage between the supply and exhaust air cannot be tolerated, we can provide the liquid coupled heat exchanger *Ecoterm®* with a temperature efficiency up to approximately.



Econet® is a further development of *Ecoterm®* with a number of benefits. It is solely used with the EU-unit. Read more about *Econet®* on page 12.



EC-unit with plate heat exchanger.

65 per cent. As this heat recovery system is based on separate supply and exhaust air units it is only used in our modular EU unit.

Recuterm®

The plate heat exchanger *Recuterm®* has a temperature efficiency of up to 65 per cent. Equipped with our patented section-by-section defrosting an energy saving solution is obtained that results in a low output requirement for the after-heater.

Turboterm™

Turboterm™ is a new rotary heat exchanger with an extremely high temperature efficiency up to 90 per cent, however, with the same functional length as *Regoterm®*.

Turboterm™ gives a very low life cycle cost and is the obvious choice for installations with higher supply air temperatures in cold climates or where cooling recovery is important.



Rotary heat exchanger cassette.



Econet® – a new way of thinking

» Econet® is a packaged liquid coupled heat recovery system with a unique control system offering highly efficient use of energy, linked with space flexibility.

Econet® is a fully packaged liquid coupled heat recovery system

A highly developed software application allows you to optimize the selection and offers thermal simulations and circuit diagrams.

Econet® is supplied complete with all necessary components starting with the optimized heat exchangers with condensate drain pans on both supply and exhaust to allow both heating and cooling in each coil. The system is complete with pump, frequency inverter, controls and all necessary valves and sensors. No need for you to select and

order the separate components, we have already done it for you!

The only job you have to do is assemble the prefabricated parts on site and supply any water/water heat exchangers to supplement the heat output.

Econet® offers higher efficiency – for more of the time

Normal liquid coupled heat recovery systems are selected for specific airflow rates.

The efficiency of the system is then a function of the airflow rate and is often optimized for the maximum design flow. In reality, ventilation

systems often run at airflow rates other than the maximum design and we then find that the heat recovery system is no longer operating at optimum. With *Econet*[®], however, the unique control system continuously monitors the airflow rate and adjusts the water flow rate to provide continual optimum recovery.

For high efficiencies, the heat exchangers should have many tube rows and long circuits so that the heat transfer area is large and the water temperature change maximized. This normally means that the water pressure drop is relatively high. The maximum pressure that can be developed by the pump often limits the potential efficiency of these systems. *Econet*[®] is equipped with high-pressure pumps that allow us to get the best out of the system and *Econet*[®] can be selected for temperature efficiencies as high as 70%.

Boost the heat when recovered heat is not enough

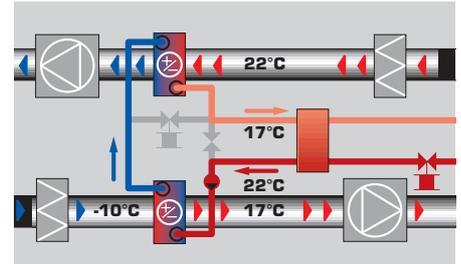
Normally air-handling systems are equipped with additional heating coils so that the required supply air temperature can be met when the recovered heat is insufficient.

Econet[®] offers you a better way to achieve this. The system has the facility to connect hot water to the recovery circuit. The control system is set up to control the heat recovery and boost heat in sequence in the same coil circuit. This means that the air-handling unit can be shorter and the air pressure drop lower. But another, perhaps more important feature is that because the heat recovery coils are so large, the hot water temperature does not need to be very high. Water at a temperature as low as 15-20°C can be sufficient, depending on the required supply air temperature. This means that low-grade heat from refrigeration systems or CHP systems can be utilized.

Econet[®] can help to lower return water temperatures, which can be useful in certain systems such as CHP.

Need cooling too?

Econet[®] can also help with this. The high temperature efficiency means that some sensible cooling can be recovered but the system allows cooling water to be connected in the same way as the hot water described above.



Econet[®] is perfect for recovery together with waste heat. *Econet*[®] utilises the available waste heat so effectively that most of the energy required during the winter can be covered through waste heat.

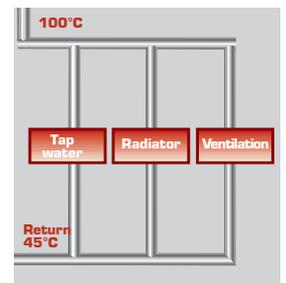
Temperature efficiency in the illustration above: 67,5%

Flexibility

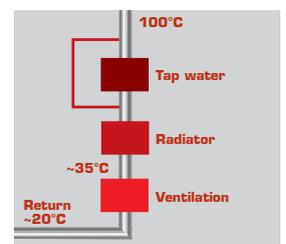
The main advantage of liquid coupled heat recovery systems is that the supply and exhaust air streams are physically separated. This is very important in certain applications where cross contamination is not acceptable such as hospitals, food preparation areas and pharmaceutical production plants.

Because the heat exchangers are separated, it allows the supply and extract systems to be placed in the most convenient spaces in the building.

The vast number of variations of size, and coil geometry allow for full optimization from an energy, hygiene and space point of view.



Conventional system



Econet system

Natural cooling with CoolMaster®



FloorMaster® diffuser

» CoolMaster® is a cooling system that cools the air with the help of an evaporative humidifier in the extract air.

The refrigerant used is fresh water! The system contains no chemicals and needs no refrigeration machine. CoolMaster® is easy to install, operating costs are kept low and CoolMaster® takes up very little space.

How does it work?

Evaporating water absorbs heat from its surroundings. For example, you know that when you leave the shower it is the water evaporating from your skin that causes you to feel cold. That is why evaporative humidifiers cool as well as humidify the air.

Key components in a CoolMaster® air handling unit are the evaporative humidifier that cools the exhaust air and an effective heat exchanger that transfers the cooling effect to the supply air.

When the outdoor temperature is high, the humidifier is used to cool the extract air. Via the heat exchanger, the exhaust air then cools the outdoor air before it enters the building.

How much cooler is it?

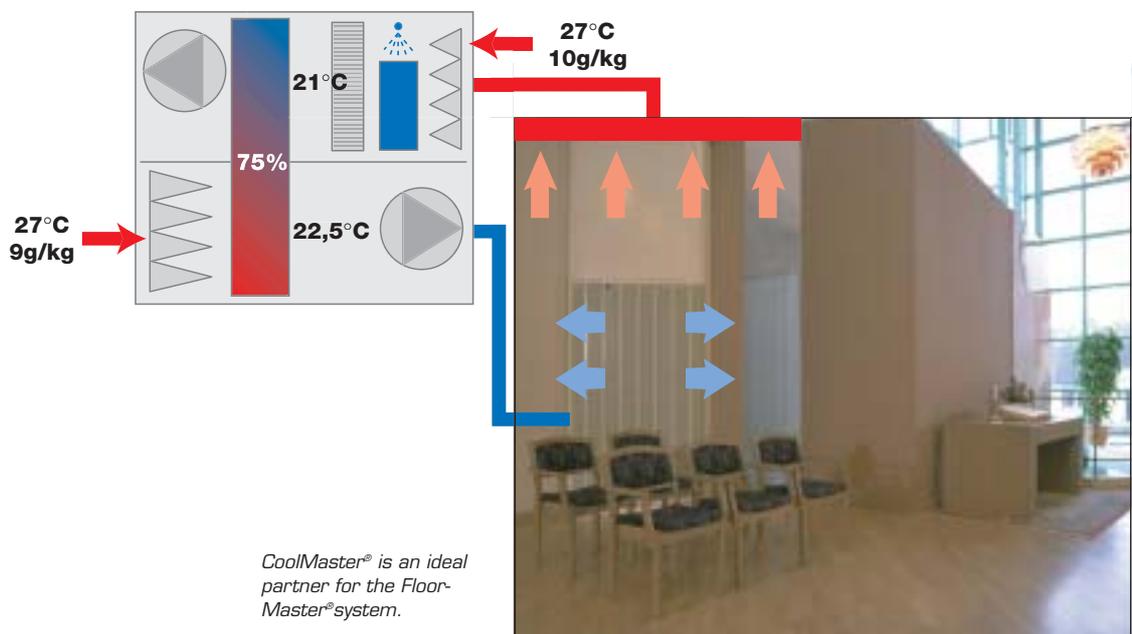
Normally the temperature of the supply air can be reduced by 4-5 degrees. The temperature reduction is influenced by several factors. The outdoor air temperature and the temperature and humidity of the exhaust air affect the result. Naturally it is important to choose an air humidifier and a heat exchanger with a high efficiency.

As the outline diagram below illustrates you can lower indoor temperatures by 4-5 °C and sometimes up to 8 degrees.

CoolMaster® cannot closely give you control air conditioning, but the temperature reduction the system gives represents significant improvements in comfort, productivity and safety in comfort applications.

Our user friendly product selection program calculates the temperature reduction you will get on the supply air, and provides comprehensive information about your unit.

The program also calculates the total annual operating cost and gives an estimated life cycle cost (LCC).



CoolMaster® is an ideal partner for the FloorMaster® system.

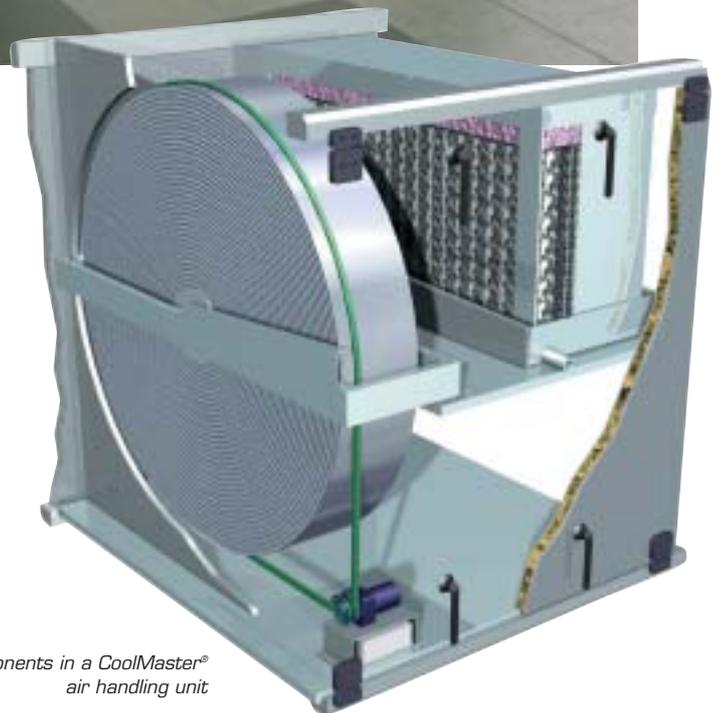


What is the operating cost?

The operating cost depends on the relevant climate, how the system is used and local electricity and water costs.

For a standard comfort ventilation system in the Nordic climate, water consumption is about 50 m³ per year and m³/s air.

The pressure drop across the humidifier means a higher energy cost to drive the exhaust air fan. This can be about 1200 kWh per m³ air and year. However, the increase can be halved if the cassette is removed during the winter months.



Key components in a CoolMaster® air handling unit

ControlMaster® control when demands are high

ControlMaster® is a complete integrated control system for Fläkt Woods units. The equipment is supplied installed for complete as well as block divided air handling units.



ControlMaster® is the perfect solution for small systems with basic control equipment as well as for large systems with demands on data communications and an integrated control system.

ControlMaster® conforms to EU directives (MD, EMC and LVD) and is CE marked.

Easy selection

ControlMaster® is easy to select using the product selection program. The program automatically selects the control equipment for the unit you have chosen. Shunts are selected for the air heaters or air coolers chosen. Frequency inverters are selected together with the motors, drive systems and

fans to give the lowest SFP_v-figure. A simple yet effective solution that saves time.

Fast track installation

Not only do you save time during the project design stage but also during installation.

ControlMaster® is complete and requires no major on site electrical installation.

The control equipment is ready for commissioning as soon as the unit is installed.

A packaged solution

In our workshop great importance is given to test running and the inspection of each control system before delivery, to assure the highest quality.

ControlMaster® is a complete package:

- Air handling unit
- Purpose designed control equipment
- Commissioning of the unit by qualified personnel



Clear lines of responsibility

When two or more different suppliers are involved in the same plant installation there can often be problems. *ControlMaster*[®] solves this problem.

Fläkt Woods will supply you with a complete plant including air handling unit and control equipment with just one guarantee for the lot. *ControlMaster*[®] is a total solution with full responsibility from a partner you can trust.

High quality

To install a control system for a high quality air handling unit requires knowledge and

experience of how air conduction is affected. *ControlMaster*[®] has been designed by the same team that designed EC 2000 with focus on design details that give a low SFP_v figure, small leakage and low noise. All cables are routed in a self-extinguishing halogen free flexible conduit with rubber seals, inside the unit.

Electronic equipment is protected and separated from the air stream by a galvanised sheet metal panel. A design built to work and last for a long time.

Cooler fully operational cooling unit

» Cooler is the complete, fully operational cooling unit for air handling units.

A factory-made module fully adapted to the unit and which is supplied complete with control equipment. The function and performance of each cooling module is run in a special test rig before delivery.

Standardised models give assured function at a competitive price – not to mention the time saved during design and installation! It is also very competitive when compared with other cooling systems.

Fast installation

The cooler is supplied complete with automation and control equipment and is factory tested. All that needs to be done on site is to connect the mains supply, connect the temperature control signal and fit the drainage pipe.

Safe and economical operation

The cooler is safe in operation. Optimised co-ordination of the refrigeration system to the EU and EC air handling units, combined with thoroughly proven and documented technical design, is the key to reliability. What's more the cooling unit is efficient and

economical. The wide range of cooling output stages ensures optimised cooling capacity.

Easy project design

No in-depth refrigeration competence is necessary to carry out the project design work. Selection is made automatically in the product selection programs for PC, quickly and simply. The product selection program has built in safeguards to ensure a 'correct' selection and provides a comprehensive printout with full performance details.

Environmentally appropriate technology

Using environmentally friendly design is one of the cornerstones of the corporate philosophy of Fläkt Woods. Development work focused on finding a design solution that provides the highest possible energy recovery, minimised environmental impact and the most energy efficient operation. This work has resulted in the perfect choice of materials and design.

Cooler is available in six EU-unit sizes, 20 to 32. For EC-units in seven sizes, 03 to 09 with a cooling output up to 124 kW.





Units for hygienic applications

» Even in its standard design the EU air handling unit satisfies the requirements for a hygienic unit.

Large inspection doors, withdrawable components and smooth internal surfaces provide excellent prerequisites for straightforward cleaning and maintenance.

For future standards

For applications demanding higher levels of hygiene we can offer EU 2000 in a version suitable for wet cleaning. The joints between panels and frame are sealed with a permanently elastic, non-toxic sealant that contains no silicon. The sealant is resistant to disinfectants and offers no sustenance to bacteria. Where necessary, a stainless steel casing can be chosen.

Often it is the area around the filter frame that needs most attention when cleaning and our filter frame is fully withdrawable to make this easier.

Simple service

In the smaller units many of the components are withdrawable as standard or as an option.

We recommend the plug fan for hygiene applications since it is easy to clean and has no belt drive.

Where centrifugal fans must be used we recommend the use of flat belts since they provide very long service with little or no shedding of dust.



Withdrawable components make cleaning easier.

Knowledge and experience

Fläkt Woods possesses vast knowledge+ experience in hospital and pharmaceutical applications and understand the demanding requirements.

Easy to install and straightforward to maintain

While our air handling units are compact and designed to fit into a limited space, you will find installation and maintenance very easy.

Each unit is supplied from the factory with specific installation instructions that show how you should assemble and start up the unit. Naturally we also provide specific maintenance instructions and spare parts lists.

Air treatment units equipped with automation and control systems are supplied complete with electrical diagrams and component data sheets.



Withdrawable components and large inspection doors make maintenance easy.

Outdoor installation

The EU and EC units are designed for indoor or outdoor installation.



With placement outdoors the unit is fitted with a protective roof structure.

There are hoods and protective grilles available as accessories that effectively keep out rain and snow.

Withdrawable components

The large inspection doors and withdrawable components make the maintenance of our air handling units extremely easy.

The EU and EC units are made to make installation as easy as possible.

The EU-unit is designed for outdoors assembly.



Fläkt Woods Group Brings Air to Life



Fläkt Woods Group provides a full range of products and solutions for building ventilation, air treatment and industrial air movement.

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