Flexomix®

A versatile range of modular air handling units

IV PRODUKT

Air handling with focus on LCC

We've been conserving the Earth's **resources** for more than fifty years

Copenhagen Airport, Harpa Concert Hall in Reykjavik, sports arenas, schools, offices, hospitals, shopping centres and homes in a number of countries all have low energy use thanks to IV Produkt. IV Produkt has been involved in a long list of projects. With energy-efficient air handling units, we make it possible to recover energy, increase property value and conserve the Earth's resources.

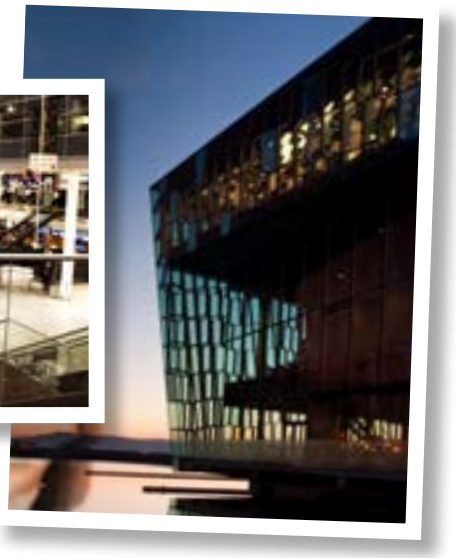
IV Produkt is a privately-owned company based in Växjö in the Swedish county of Småland that develops and manufactures innovative solutions for air handling. We have been doing this since 1969.

Today, we are the market leader in the Nordics and have the fastest development rate in the industry. Quick turnaround times make us efficient, and the way in which we take responsibility makes it both safe and easy for you as a customer.

Energy efficiency and environmental considerations have been part of our business concept since 1991, prompting us to focus on the life cycle cost, LCC. In other words, the total cost of purchasing, operation, service and environmental impact. We want this cost to be as low as possible and regard it as a natural aspect of our product development. We are ISO certified under 9001 and 14001, which we consider essential.

Development, production and head office in Växjö.

Our products and many years of experience enable us to identify innovative solutions for air handling which are perfect for your particular project. We will gladly help you personally to achieve our common goal of protecting the Earth's resources.



EUROVENT CERTIFIED PERFORMANCE
AHU 00.09.027 and AHU 05.07.300
Flexomix and Envistar
www.eurovent-certification.com

Eurovent Certification is a certification body which verifies the performance of air handling units in accordance with European and international standards. It allows products from different manufacturers to be compared on equal terms.

Our Envistar and Flexomix air handling units have been tested by Eurovent in accordance with EN 1886 and EN 13053. When performance calculations carry the above mark, you can be sure they have been certified by Eurovent Certification.

Masters of energy efficiency

Flexomix was developed to meet the requirements for energy-efficient ventilation both today and in the future.

In order for a range of AHUs to be energy-efficient, it is important that a wide variety of physical sizes is available.

Flexomix is available in 24 sizes, facilitating optimal air handling.

Flexomix can be used in most types of building, e.g. hospitals, offices, industrial premises, schools, hotels and shopping centres.

Flexomix®

Modular system
The air handling unit is designed as a modular system. You choose the functions you need from our extensive range.

High-efficiency fans and motors

The new EcoCooler integrated cooling unit with stepless control of cooling power and cooling recovery

High-efficiency heat recovery unit

Newly developed casing for optimal U value

The flexible **solution**

Thanks to its 30 functions, Flexomix offers you the opportunity to create a customised, energy-efficient air handling unit. The flexible modular system is available in several dimensions in order to be adapted to the various conditions of the fan space and to simplify transport through narrow passages.

- Air flow 0.10–23.6 m^3/s
- Available in 26 sizes
- 30 different functional components
- Several choices of efficient energy recovery rotary heat exchanger, plate heat exchanger and coil recovery
- Sizes 100–1280 can be supplied with an EcoCooler cooling unit
- Available as an outdoor version

New!

- New energy efficient fans and motors with optimal performance
- The module sections can be supplied with ThermoLine casing in energy efficiency class T2
- The Flexomix range can be supplied in the highest energy class A^+ in accordance with Eurovent's energy efficiency classification scale A^+, A, B, C, D and E.

Simple assembly, installation and flexible maintenance

The Flexomix design is made so that installation, service and maintenance will be as flexible as possible.

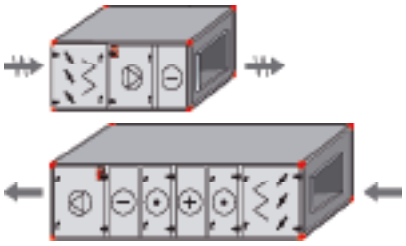
The module sections are fitted together quickly and easily using a screwdriver at each corner of the unit.

When installed outdoors, the unit is supplied with a protective roof structure, inlet grilles and an exhaust hood.

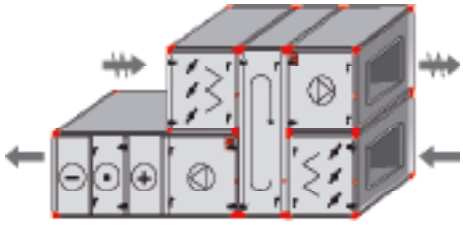
Meets your needs

Delivery version

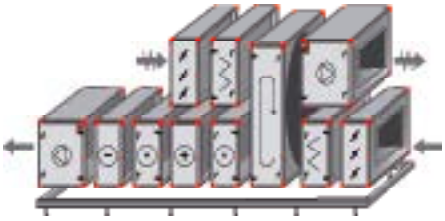
With the Flexomix modular system, we can offer you various delivery versions depending on your specific requirements and what is appropriate as regards transport and lifting.



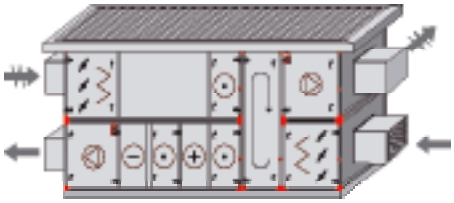
Supply and extract air unit, 1-height



Supply and extract air unit, 2-height

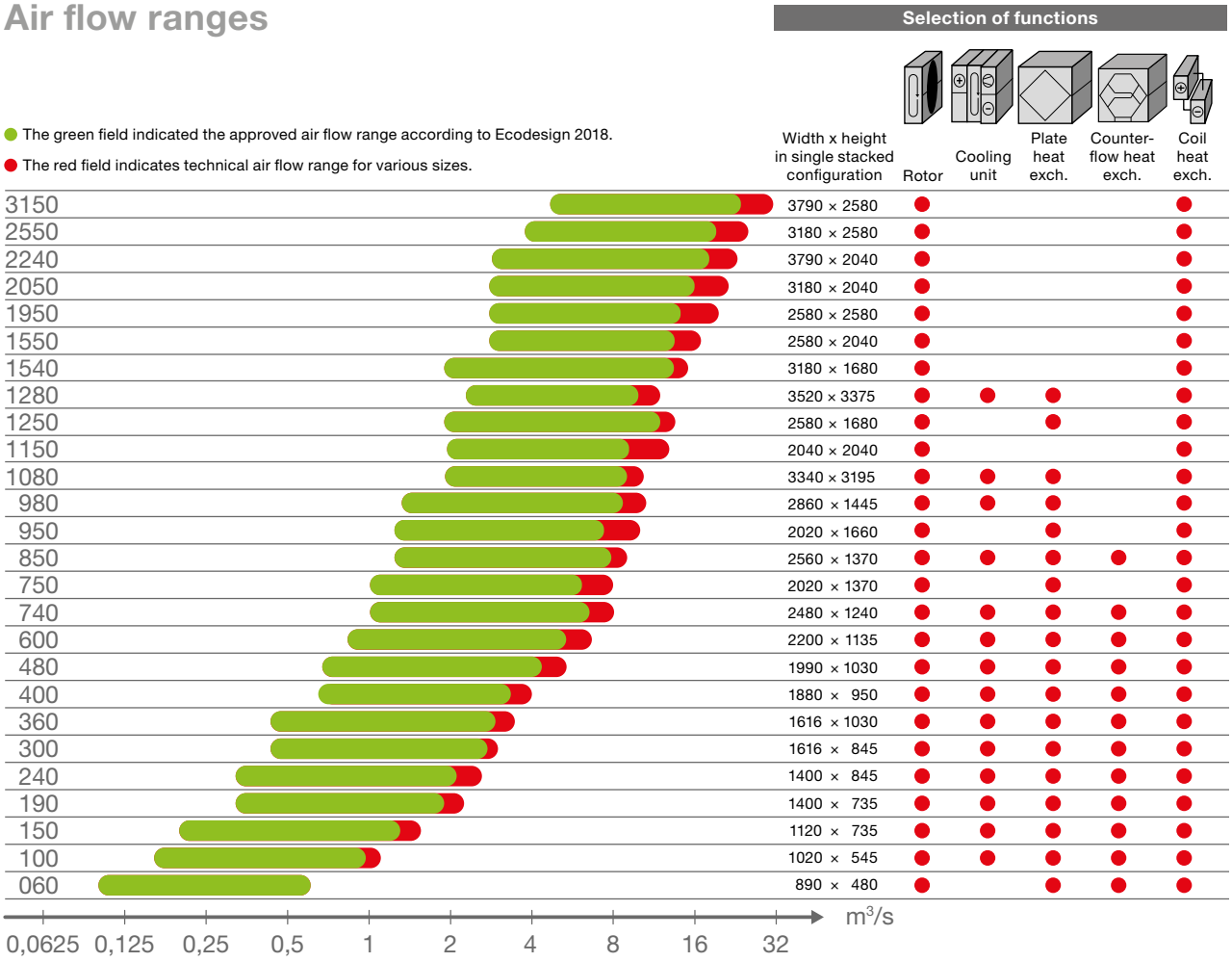


In sections with stand



Outdoor version

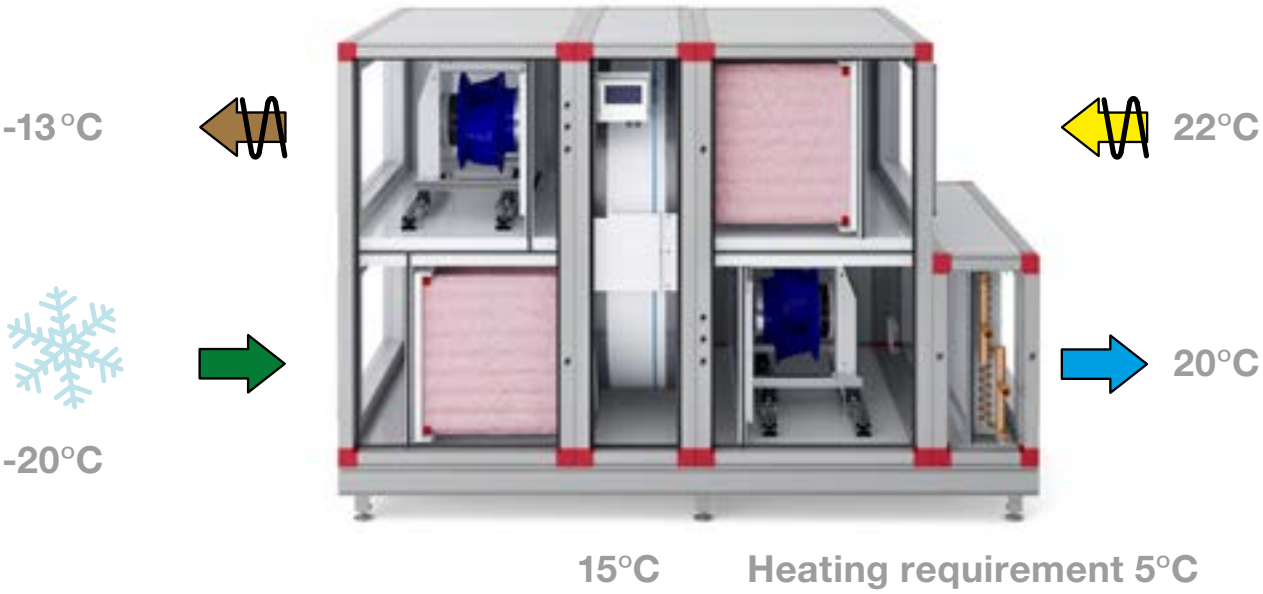
Air flow ranges



We protect resources

Air that is extracted via ventilation systems often contains a lot of heat. We do not want to let this heat go to waste and aim to recover as much of it as possible. We do this by using various types of heat exchanger. We recover the heat from the extract air and use it to heat the cold air from outside. There are several different types of high-efficiency heat recovery units in the Flexomix range. This allows us to offer the most optimal solution at the same time as protecting the Earth's resources.

Heat recovery



On a cold winter's day with an outdoor temperature of -20°C, we can recover sufficient heat from the extract air to heat the supply air to 15°C using a rotary heat exchanger. In this case, we only need to heat the air by 5°C instead of 40°C in order to achieve an inlet temperature of 20°C.

Rotary heat exchangers

The Flexomix range includes a large number of rotors for heat, cold and moisture recovery offering a low pressure drop and high efficiency. Various versions of the rotors are available in order to optimise your LCC calculation. All rotors have stepless speed control to maintain a constant temperature.

- Highly efficient heat recovery unit with a dry temperature efficiency of up to 87%
- For each aggregate size, there are several variants of rotor foil spacing for optimised heat recovery and life cycle costs
- Many of the sizes are available with different diameter rotors to further optimise the efficiency of the system
- Available with hygroscopic surface for improved cooling recovery

Counter-flow exhanger

- High-efficiency heat recovery unit that can achieve a dry temperature efficiency of 85%
- Patented defrosting technology – ODS
- No risk of odour transfer

Plate heat exchanger

- The plate heat exchanger is a complete unit which uses heat transfer according to the air-air principle.
- The plate heat exchangers are available with different fin pitches for optimal efficiency.
- No risk of odour transfer

Coil recovery

To optimise recovery using liquid-coupled coils, many different versions are available. Heat recovery coils are suitable for use when the supply air and extract air systems are separate or when you want to eliminate the risk of leakage between the supply air and extract air.

- 8–24 pipe rows for optimal heat recovery
- Several different surface treatments are available as optional extras, for example, epoxy
- The coils are available with different fin pitches in order to be adapted to the project

Efficiency

In the industry, the performance of heat recovery units is presented in different ways. For example, we might talk about dry and wet temperature efficiency.

According to the EN 308 standard, dry efficiency should be used to indicate the performance of heat exchangers. This method is used so as not to give a misleadingly high performance by incorrectly utilising the air humidity.

Pleasant indoor climate

The EcoCooler integrated cooling unit is available for much of the Flexomix range. You get a turnkey solution for ventilation and comfort cooling which does not require any outdoor installations.

All the cooling unit's components are built into the air handling unit. You get a complete CE-marked cooling unit for comfort cooling which is always test driven in our test facility. A unit with integrated cooling requires significantly less energy than one with an external cooling unit.

The Flexomix range includes the integrated EcoCooler cooling unit which is available in sizes 100–980.

EcoCooler

The EcoCooler is a turnkey solution which will meet your needs for cooled air, low installation costs and reduced operating costs.

In some buildings, the air flow varies considerably and a highly accurate supply air temperature is required. The EcoCooler uses a frequency inverter to enable stepless control of cooling power.

- Air flow 0.25–10.4 m^3/s, cooling power 4–260 kW
- High COP, 4–7
- Ideal for large variable air flows (VAV)
- Available with cooling recovery
- No outdoor installations and creates a fifth facade
- Short build lengths for simple transport and smaller installation space
- Complete CE-marked cooling installation

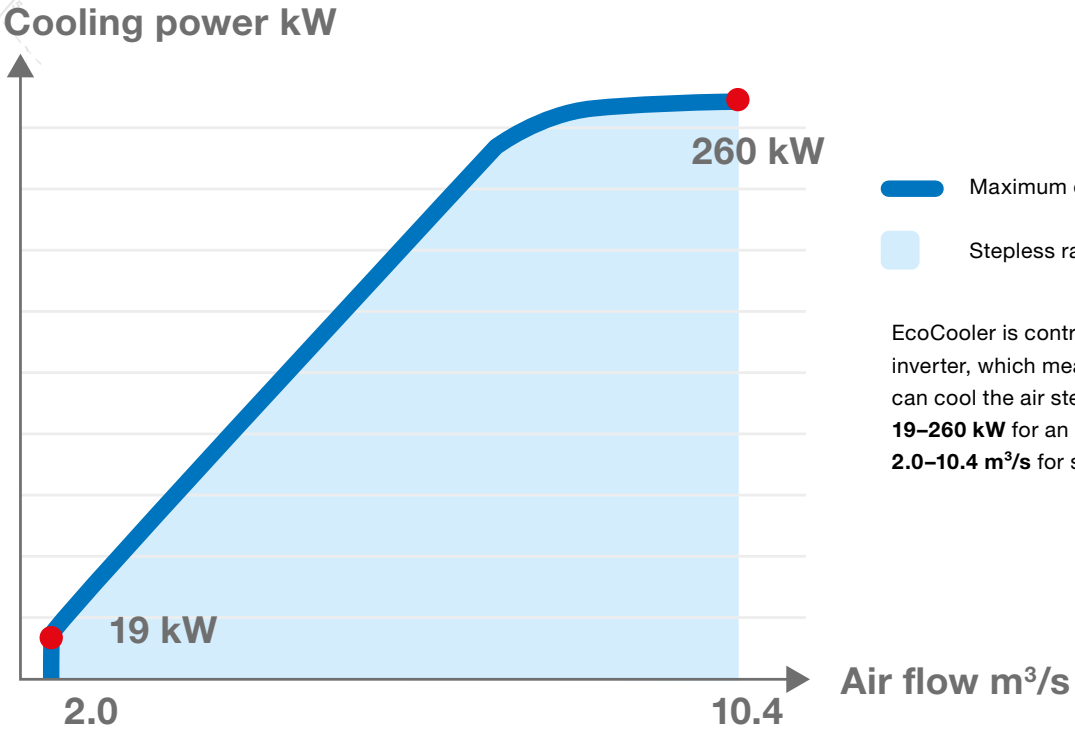
Read more about the new EcoCooler in the separate brochure.

Creates a fifth facade ...

with no outdoor installations

EcoCooler means that there is no need for any cooling medium cooler or liquid cooler to be standing on the roof. In many places there is a lack of both land and building space, which means higher prices. EcoCooler frees up space on the roof and enables a fifth facade. The roof surface can be used as a pleasant roof terrace with infinite possibilities. The property becomes more attractive, space is freed up, the property increases in value and the rental income increases.

Stepless control



EcoCooler is controlled by a frequency inverter, which means that the unit can cool the air steplessly between **19–260 kW** for an air flow of **2.0–10.4 m³/s** for size **1280**.

Cooling recovery

The EcoCooler cooling unit is available with an integrated rotary heat exchanger for cooling recovery in sequence with the cooling unit. This maximises energy utilisation and ensures a low connected power load.
The rotary heat exchanger can be selected in different configurations for optimal energy recovery. The rotors are also available with a hygroscopic surface, further reducing energy use.

Did you know that...

The operating cost of cooling a building with EcoCooler is very low? For an area of 300 m² with 1 m³/s air, you will use just approx. 1,000–2,000 kWh per year, depending on the operating time and cooling requirement.

On a hot summer's day with an outdoor temperature of 28°C, we can recover sufficient cooling from the extract air to cool the supply air to 23.5°C. In this case, we only need to cool the air by 7.5°C instead of 12°C in order to achieve an inlet temperature of 16°C.

Top performance

The Flexomix range is available with wide range of high-efficiency fans and motors in order to optimise the fans' efficiency and minimise electricity consumption. Each fan impeller and motor is balanced and test-run together to guarantee function, ensuring a long service life. The direct-driven fans are intended for speed control and have a built-in rotary diffuser. They offer low sound levels and high efficiency.

Fans with PM motors and EC control

- Available for sizes 060–1280
- Rotating diffusor and airfoil blades
- Aluminium/composite fan impeller
- Permanent magnet motor, efficiency class equivalent to IE3/IE4
- EC control via 0–10 V

Fans with PM motors and integrated frequency inverter

- Available for sizes 480–980, 1250 and 1540
- Rotating diffusor and airfoil blades
- Epoxy-coated steel impellers
- Permanent magnet motor, efficiency class equivalent to IE4
- Integrated frequency inverter control via 0–10 V

Fans with AC/PM motors

- Available for sizes 060 to 3150
- Rotating diffusor and airfoil blades
- Epoxy-coated steel impellers
- Induction motor, efficiency class IE3
- Permanent magnet motor, efficiency class equivalent to IE4, option
- Speed control via external frequency inverter, option

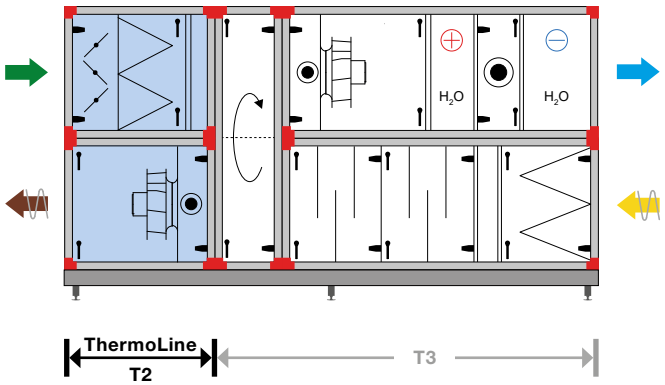
A casing that provides added **benefits**

Thanks to our rapid pace of development, we are continually getting better at energy-optimised air handling.

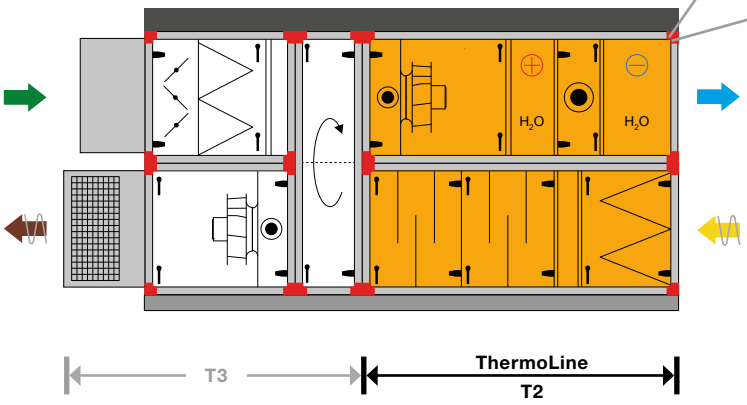
This product development means the entire range has a casing with optimum energy performance and design.

We have worked on innovative solutions throughout the entire manufacturing process, enabling us to offer units with minimised heat loss through the casing. According to the EN 1886 standard, the classification of the casing is determined by the U value. The lower the number, the better the insulation capacity.

Indoor AHUs



Outdoor AHUs



* Measured by Eurovent in model box in accordance with EN1886.

ThermoLine

Two configurations of the casing are available. The standard version is classified under casing class T3, which has a U value of 1.24*. For the best energy performance, you can now also choose ThermoLine, which is a class T2 casing and has a U value of 0.88*.

A casing class of T2 reduces cold bridges. In fan rooms with high air humidity, this reduces the risk of condensation forming on the unit casing.

Class T2: U value 0.5–1.0
Class T3: U value 1.0–1.4

A major advantage of this casing design is that we can select different casing classes for selected parts of the unit. For example, we can select the inlet and exhaust air sections for a **ThermoLine** – T2 indoor unit to offer the most energy-efficient and cost-effective solution.

The black plastic insert in the profile breaks the cold bridge and is a characteristic of the **ThermoLine** – T2 casing.

In the case of outdoor air handling units, the supply and extract air sections are the primary cause of heat losses. Using **ThermoLine** – T2 for these sections offers the most energy-efficient and cost-effective solution.

The pay-back period for ThermoLine depends on the installation's operating conditions and energy prices.

Hygienic design **simplifies** cleaning and maintenance

Hygienic design according to VDI 6022 means, among other things:

- extended options for inspection of all unit components
- easier cleaning of units, fans, heat exchangers and coils
- drip trays under cooling coils have inclines towards drains
- high requirements for material selection for gaskets, seals and attachments
- extended requirements for technical and operating information.

Hygienic design for air handling unit according to VDI 6022 places specific requirements on the duct system and operation and maintenance.

When ordering the unit in hygienic design, the instructions and other documentation are included according to the requirements in VDI 6022.

Customised material

The standard material for both internal and external doors and panels is alu-zink in corrosion class C4.

Certain environments require a higher corrosion class. In which case it is possible to have a stainless steel or painted interior. Certain fittings are also available in a painted or stainless steel configuration.

The architecture requires, among other things, that the colour matches the colouring of the building. In which case there is an option for a painted exterior.

Make everyday life **easier**

We want to make everyday life easier for consultants, installers and contractors. Our program IV Produkt Designer will help design and dimension the air handling unit.

We have developed a tool which enables you to perform calculations using the data for your project. Using the program **IV Produkt Designer**, you can easily and quickly design your unit to meet different needs. You will receive a dimension drawing with technical data containing specific fan power values, temperature efficiency, sound data and much more.

Captions, AMA, are available for each project run in the application, and can be exported to a Word document. The caption is a documentation of the unit and forms the basis for instructions, operation and maintenance, and can be used to copy information to project documents. There is also a plugin for IV Produkt Designer to connect the program to MagiCAD for AutoCAD. The file contains all data that is needed for planning. Another plugin makes it possible to export project files to Revit.

You can also perform a separate LCC and investment calculation for an existing or new unit in the program. This gives you the opportunity to calculate the profitability of replacing a unit.

IV Produkt Designer can be downloaded free of charge from www.ivprodukt.com, or contact us and we will of course be happy to help you.

The most profitable sustainability investment

It is easy to make investment decisions with calculations from IV Produkt Designer. The calculation includes accounting of

- Energy savings
- Economy och payback-period
- Calculation of increased property value

An older ventilation unit that appears to be in good condition may be unexpectedly profitable to replace. It is easy to calculate energy savings and payback period when replacing e.g. a unit from the 1990s. Given that it is over 20 years old, today's units are significantly more efficient.

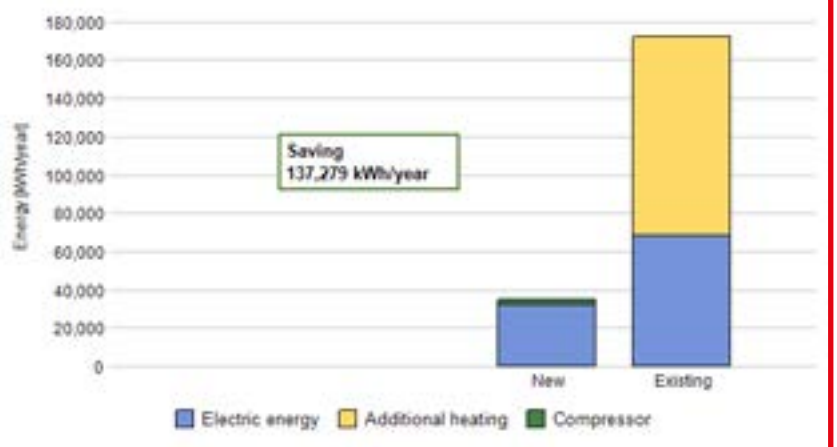
On this page and the next you can see an example of a completed project with replacement of older ventilation units.

Envistar Flex *Investment calculation*

Project name
Name of AHU LA03
Size 850 20,000/20,000 m³/h

Energy

	New	Existing	
Temperatures			
Supply air temperature	20.0	20.0	°C
Return air temperature	22.0	22.0	°C
Annual average temperature	10.0	10.0	°C
Running data			
Flow supply air	20,000	20,000	m³/h
Flow extract air	20,000	20,000	m³/h
SFP value	1.63	3.50	kW/(m³/s)
Exchanger's temperature efficiency (dry)	87.8	40.0	%
Running time	3,500	3,500	hours/year
Energy performance			
Ventilated area	2,200	2,200	m²
Calculated energy performance, ventilation	15.8	78.2	kWh/m²
Annual energy usage			
Supplyair fan and Extractair fan	31,745	68,056	kWh
Compressor	3,105		kWh
Additional heating	0	104,073	kWh
Total	***34,850***	***172,129***	***kWh***



Saving	62	kWh/m²
Saving %	80	%/m²

ENERGY

- Savings: **137,000** kWh/year
- Equivalent to **62** kWh/m²/year
- Means savings of 80%
- Can be used in the sustainability report.

ECONOMY

- Payback period: **5.9** years
- Energy cost savings year 1: approx. **13,300€**
- Savings over 20 years: approx. **287,000€**
- The increase in property value is greater than the investment cost.

Envistar Flex *Investment calculation*

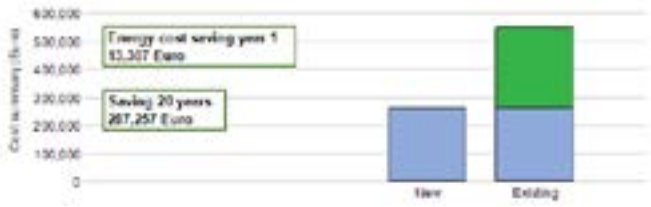
Project name
Name of AHU LA03
Size 850 20,000/20,000 m³/h

Economy

Economic factors

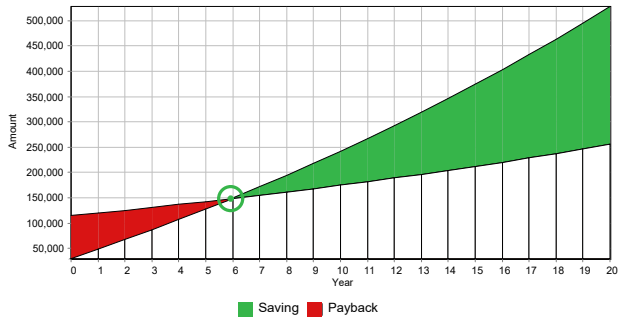
Energy price El	0.15	Euro/kWh
Expected annual price increase electricity	3.0	%
Energy price add heat	0.08	Euro/kWh
Expectel annual price increase heating	3.0	%
Life expectancy	20	years
Running time	3,500	hours/year

Cost summary, Lifetime	**New**	**Existing**	
Investment	115,000	30,000	Euro
Energy cost 20 years	146,021	518,278	Euro
Cost summary	261,021	548,278	Euro



Payback Diagram

Payback time based on energyprice increase: **5.9 years**
Return on investment: **15.7 %**



PROPERTY VALUE

Envistar Flex *Investment calculation*

Project name
Name of AHU LA03
Size 850 20,000/20,000 m³/h

Changed real estate value
The calculation show how the installation of more energy efficient air handling increase the real estate value.

Energy cost saving / Increased operatioal net 13,307 Euro/year
Expected return 8.0 %
Calculated increased value **166,338 Euro**

Energy saving / Expected return = Calculated increased value
13,307 / 0.08 = 166,338 Euro

Other potential aspects on real estate value increase have not been included in the calculation.

Increase in property value

Energy savings reduce the property's total operating costs. The net operating income is calculated by deducting operating costs from total rental income. If you divide the net operating income by the property's required rate of return, you get the property value.

A higher net operating income thus leads to an increase in property value. And a higher property value creates opportunities for making new investments.

$$\frac{\text{net operating profit}}{\text{required rate of return \%}} = \text{property value}$$

$$\frac{13{,}300€}{8\ \%} = 166{,}000€$$

Projects we have delivered to...

Here is just a tiny selection of the thousands of projects in which, together with consultants and installation firms, we have used our wide range of products to deliver innovative solutions for energy- and cost-effective air handling.

Scania in Oskarshamn, Sweden

Harpa Concert Hall in Reykjavik, Iceland

Gothia Towers in Gothenburg, Sweden

Northern Europe's largest hospital, Skejby in Århus, Denmark

Titanic Museum in Belfast, United Kingdom

... over the years

Prague Metro, Czech Republic

Kastrup Airport, Copenhagen, Denmark

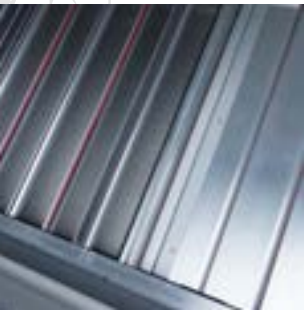
Nationalmuseum in Stockholm, Sweden
Photo: Hans Thorwid

The Deichman Bjørvika Library in Oslo, Norway
Photo: Nicholas Vogt

Experium, experience centre in Sälen, Sweden

IV PRODUKT

Air handling with focus on LCC





This is just part of our wide range. For our full range, see www.ivprodukt.com or contact us to find out more.

You are welcome
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