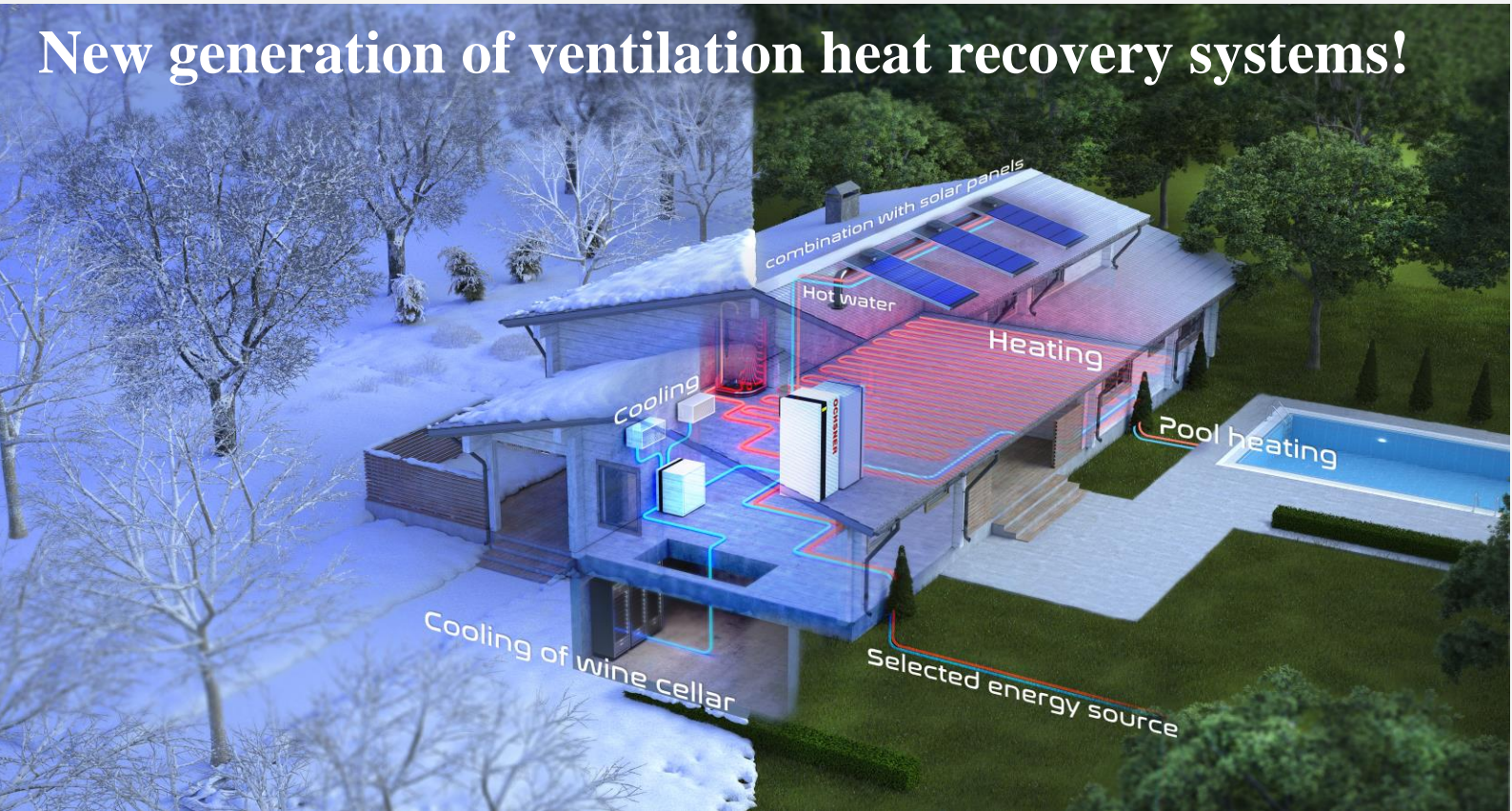




New generation of ventilation heat recovery systems!



HEAT RECOVERY WITH - SoleRec

Super-effective ventilation heat recovery solution gives the customer a choice which is profitable, efficient and reliable.

SoleRec is a ventilation heat recovery system that is mainly for apartment buildings and industrial sites but can also be used in private houses.

This novel ventilation heat recovery systems, by its technical solution and build-up, is very simple.





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The principle of operation

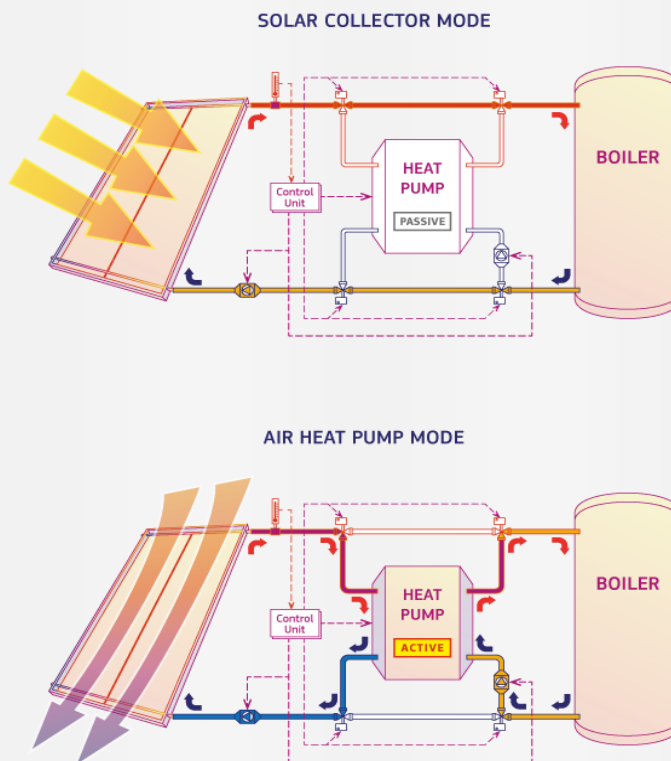
SoleRec system has a heat recovery panel that, owing to its compactness, can be modularly mounted on top of the ventilation-outlets/chimneys. It has to be kept in mind that SoleRec is a system, not just the panel, consisting of different parts like accumulators, heat pump, controller and connecting pipes.

Part of the SoleRec's panel is a ventilator that sucks the air out of the building, as a regular ventilation system. Warm air from the building flows through the heat recovery panel, transferring the heat to the heat exchanger that in turn transfers the heat to the heat exchange liquid that is circulating in the system. After the heat transfer, cooled air exits the heat recovery panel.

SoleRec panels are unique because of the heat exchangers, used for the heat transfer, that are made of stainless steel and coated with solar absorption layer. Due to the absorption layer, the heat recovery panels can be used as solar water heating panels as well.

After excess air has heated the heat exchange liquid, the liquid goes into a heat pump where the temperature of the liquid is efficiently raised and given to the heating system through hot water accumulators.

Principle schemes of the solar collector and heat pump modes:



Construction of the SoleRec panel

Absorber heat exchangers are the „heart“ of the panel. To make it weather-proof and long-lasting, the panel is built from stainless steel sheets. The heat exchangers are installed into a box made of stainless steel profiles. Then the heat exchangers' pipe connections are made, solar glass installed and a ventilator mounted. Backside and the sides will be insulated.

Condensate will form during the heat recovery process. Condensation of water provides heat exchangers' self-cleaning and exits through specially designed holes in the bottom of the panel.

Standard panel sizes are: 2,05x1,5 m;
 2,05x2,0 m ;
 2,05x3,0 m

Pipe connections are: 1/2“, 3/4“ or 1“ external thread.

The front side of the panel before the installation of ventilator and glass:



Back side of the SoleRec panel::



Polarsol heat exchanger



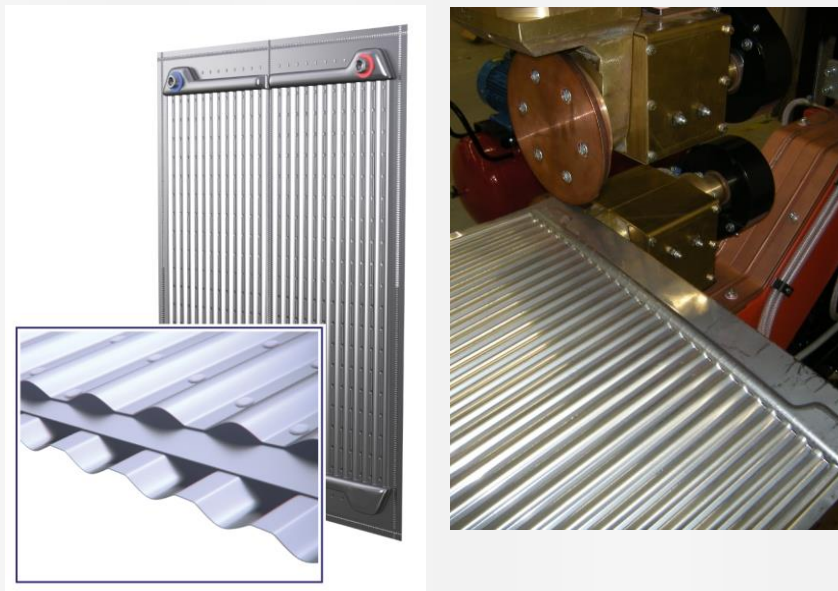
Polarsol's heat exchanger is made of two stainless steel sheets that are rolled, annealed and are therefore also acid-proof. The thickness of the stainless steel sheet is only 0,3mm(razors are made of the same stainless steel sheets). Heat exchanger and its production process are patented.

There are three different types of heat exchangers in three different sizes. Additionally, there are different possibilities for connection schemes. These features make it possible to use the heat exchangers in different environments and for different purposes. Alternatives of usage is also widened by the heat exchanger being resistant to acid and oxidation

The thinness of Polarsol's heat exchanger guarantees a quick heat transfer rate in many environments. It starts to transfer heat from one environment to another almost instantaneously.

Useful surface area of a panel is 97% (area of a panel that is useful for the heat exchange process) and it has 54m of channels per on m². Due to these features, it is assured that all the heat is transferred from one environment to another.

Illustration of Polarsol's heat exchanger. On the right, rolled heat exchanger before welding:



The width of a heat exchanger is 505 – 510mm. Three different lengths are: 670mm, 1000mm, 2000mm.

Polarsol's heat exchangers:



Ventilator

The ventilator is chosen according to the scale of the building and its air flow rates, although it is mostly standardised since the ventilator's airflow rates can be adjusted through the controller.

The benefit of having a ventilator with adjustable airflow is that the heat usage of a building may widely vary between different days and also between day- and night-time usage. For example, in the factories or office buildings, ventilation is optimised for people's working hours. In apartment buildings, the optimisation is between day- and night-time.

SoleRec

Robust—few failure prone parts

Efficient—high output-input ratio and short payback period

Solar energy – sun provides hot water heating as an extra

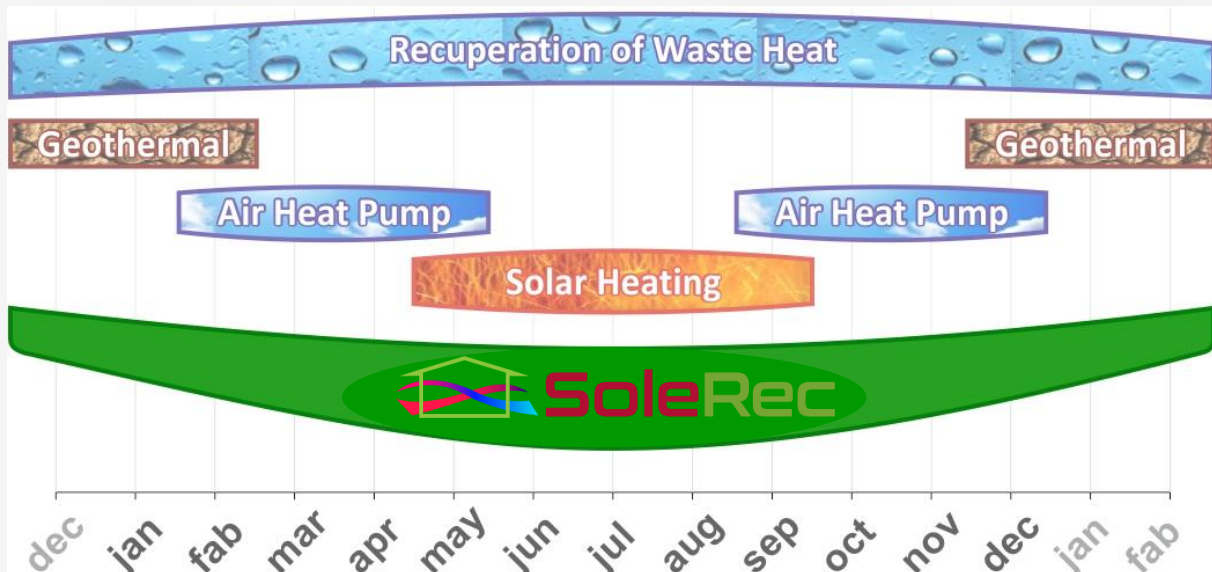
Comfortable – automatic system- and heat management

Unique—unparalleled hybrid heat recovery system

Economical – saves nature and reduces heating costs

Scalable—can be installed in buildings of all sizes

Helps to meet building's EU energy efficiency regulations



The picture illustrates heating source efficiency by season. It can be seen that different heat sources ought to be combined for maximal efficiency. SoleRec panels in combination with Polarsol's heat exchangers are created to harness the potential of the different energy sources and to be used all year round.

In ventilation heat recovery system, a heat pump is installed between the panels and accumulators. If the sun is not shining, then the panels technically work as the outside part of an air-water heat pump.

Installation

The device is delivered as a compact product. The only part which needs to be installed on the site is the panel, which is attached hermetically to the chimney. In order to maintain the stability, of the angle of the panel, and reduce the load, on the structure, two additional supportive legs are added.

The product installation has been made as simple as possible; here are the four steps which need to be done:

- To connect the device to the ventilation shaft
- Install and connect the pipes, heat pump and accumulators
- Adjust the electrical system
- Adjust automatics

Ventilation heat recovery

The working principle:

The polluted air is sucked with a fan through the SoleRec panel; exhaust air is cooled down to condensation temperature with the heat pump; the heat is directed to accumulation tanks.

The advantages of the system:

- The energy potential of the whole ventilation exhaust air is captured
- The condensed water collects all the flying particles from the ventilation
- Low maintenance (as the dirt and other flying particles are collected with condensed water, therefore no additional filters before the fan are needed)
- Long life cycle of the product

Project in Russia:



Solar panels

Since the heat exchangers have a very good heat transfer rate, panels can be used just as solar collectors as well.

Advantages:

- Greater heat transfer surface
- Stable and rigid construction
- Fast heat transfer

Solar absorbers in SPA in Ukraine:



Contact

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