SolarVenti® Industrial

Solar air collectors for industry and larger halls

Efficient dehumidification and air heating for free....

This booklet contains information about SolarVenti Industrial air solar system.
The system is patented in the most relevant countries, including throughout Europe, Eurasia, China, Japan, USA, Canada etc.. In Canada and the U.S. are patent used by one of the leading companies in the industry: Energy Concept and marketed under the name Luba. See their website at www.enerconcept.com

SolarVenti Industrial can be placed on the roof or ground with no or little slope.
For building facades, it is recommended to use the Canadian system Lubi, as SolarVenti A / S dealer in Scandinavia.

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General information

SolarVenti Industrial solar air collectors ®

significantly reduces the cost of heating large halls and buildings which require an air exchange.
It is highly effective and very easy to install.

The main advantage is a system that brings fresh and dry air into the building.

The air enters the collector by a patented double-perforated rear wall.

The air passes through the absorber which consists of a black technical material that is resistant to high temperature, and which also acts as a filter ..
Unique to this collector is how it converts solar radiation to warm, fresh air. The air gap between the back wall and absorber provides sufficient thermal resistance to transfer solar energy to the incoming air, and eliminates the need for isolation.

All in all, this is a lighter and more compact solar air collector than seen before, which is also very effective.

Another great advantage, which can easily be overlooked is that the filter, which is also the absorber automatically will be cleaned by the solar heat, when the fan is switched off in the sun. When the temperature exceeds 80 degrees, the solar heating is cleaning and disinfecting the felt - which means: **zero maintenance.**

The following descriptions provide technical information for designers and suppliers of ***SolarVenti Industrial***

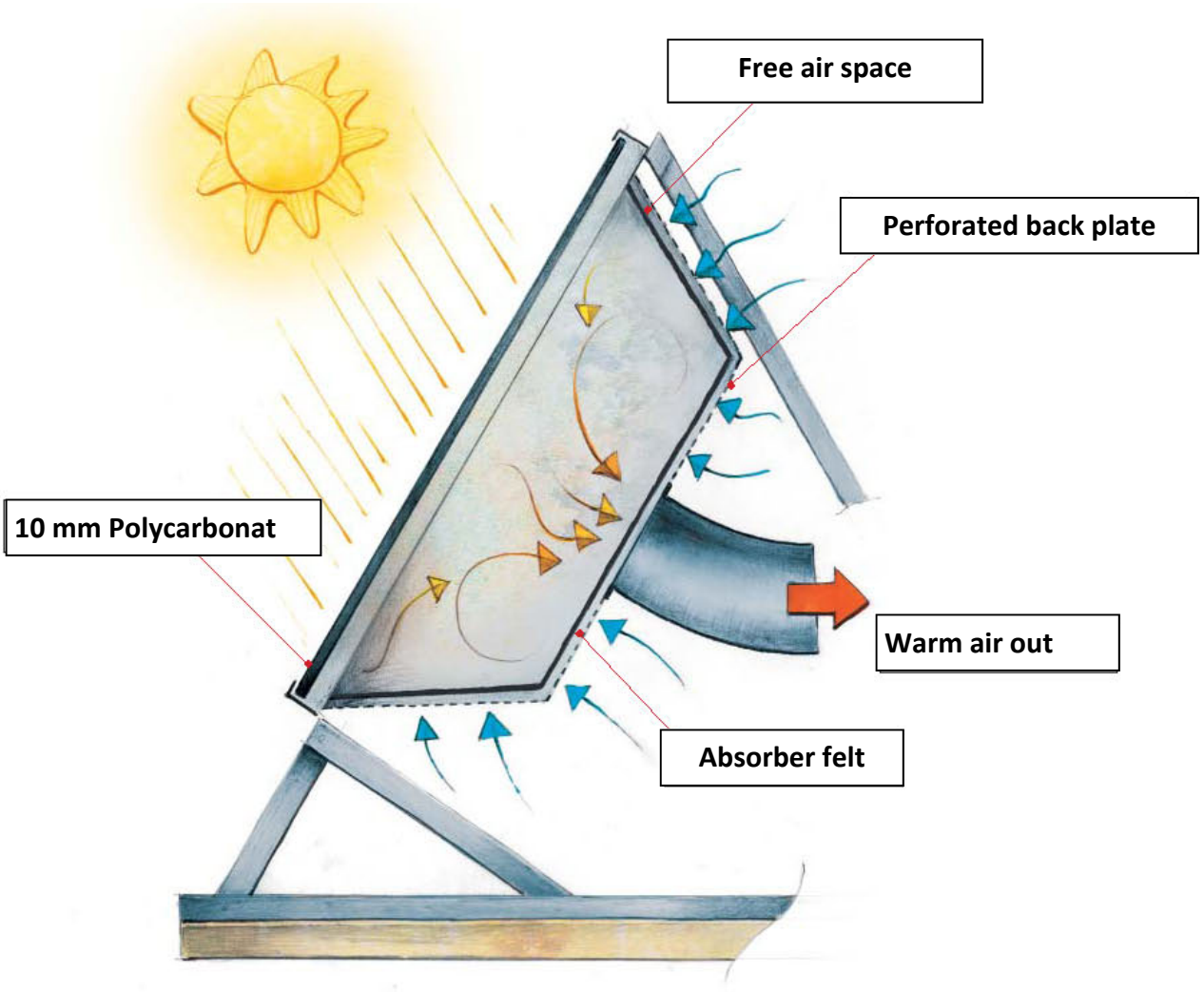


Fig 1: principal of SolarVenti Industrial air collector

Data:
Dimensions L x W x H: 1975 x 1004 x 450 mm
Absorber area D x H: 1935 x 964 mm
Efficient solar surface: 1.87 m2/element
Panel height from the roof: 20-90 cm (depending on the project)
Net Weight of an item: 7 kg

Applications
• Preheating of new air for industrial, commercial, institutional and agricultural buildings in cold climates.

• Preheating of air to air heat pumps (heat recovery) "air-air" or 'air-water'.
• Drying of grains / crops in agriculture.

Installation
When planning the system, the collectors should be orientated as much North as possible. A minor deviation up to max 45 degrees from the North can be compensated by increasing the area.

The length of each row can be adjusted as needed to avoid, for example. roof exhaust pipes or chimneys

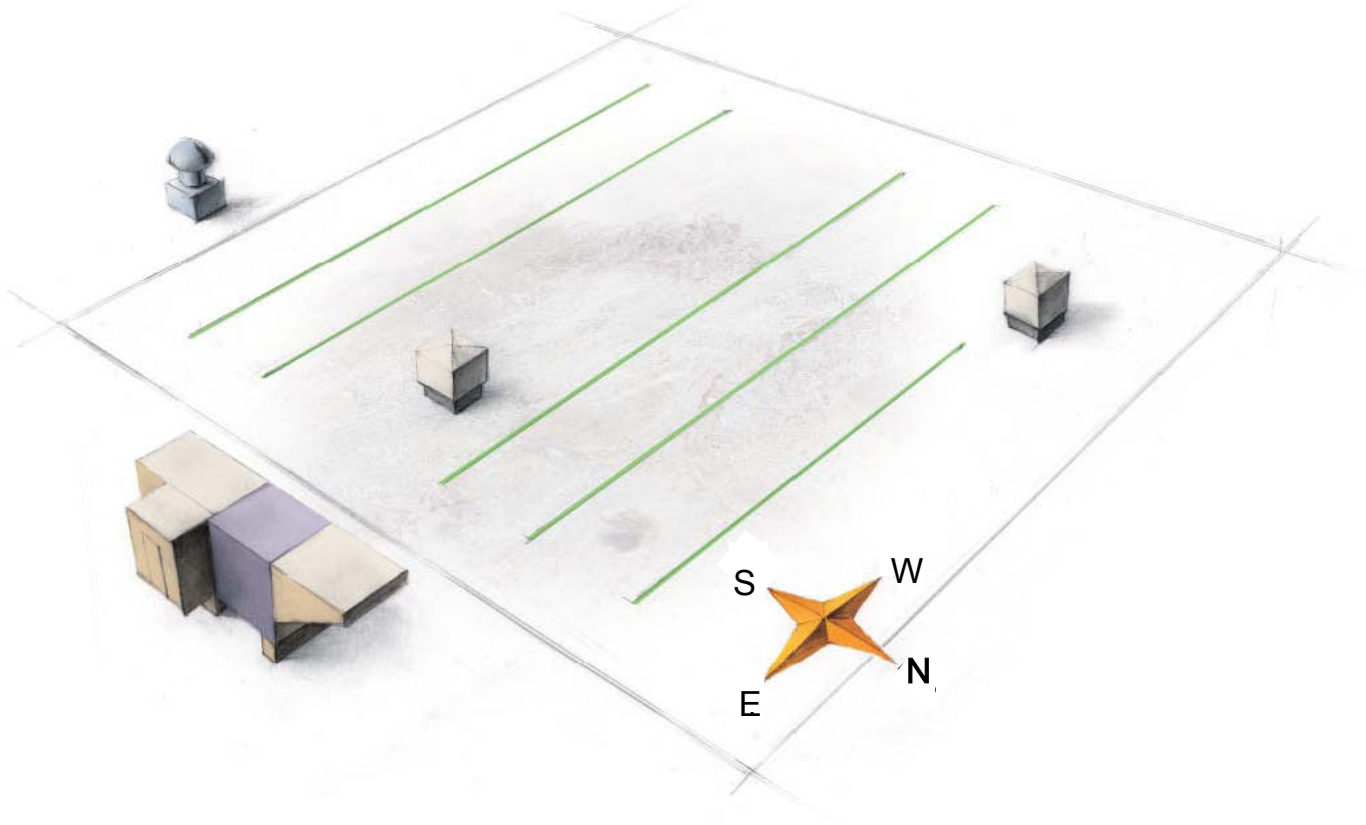


Figure 2. Planning the placing on the roof

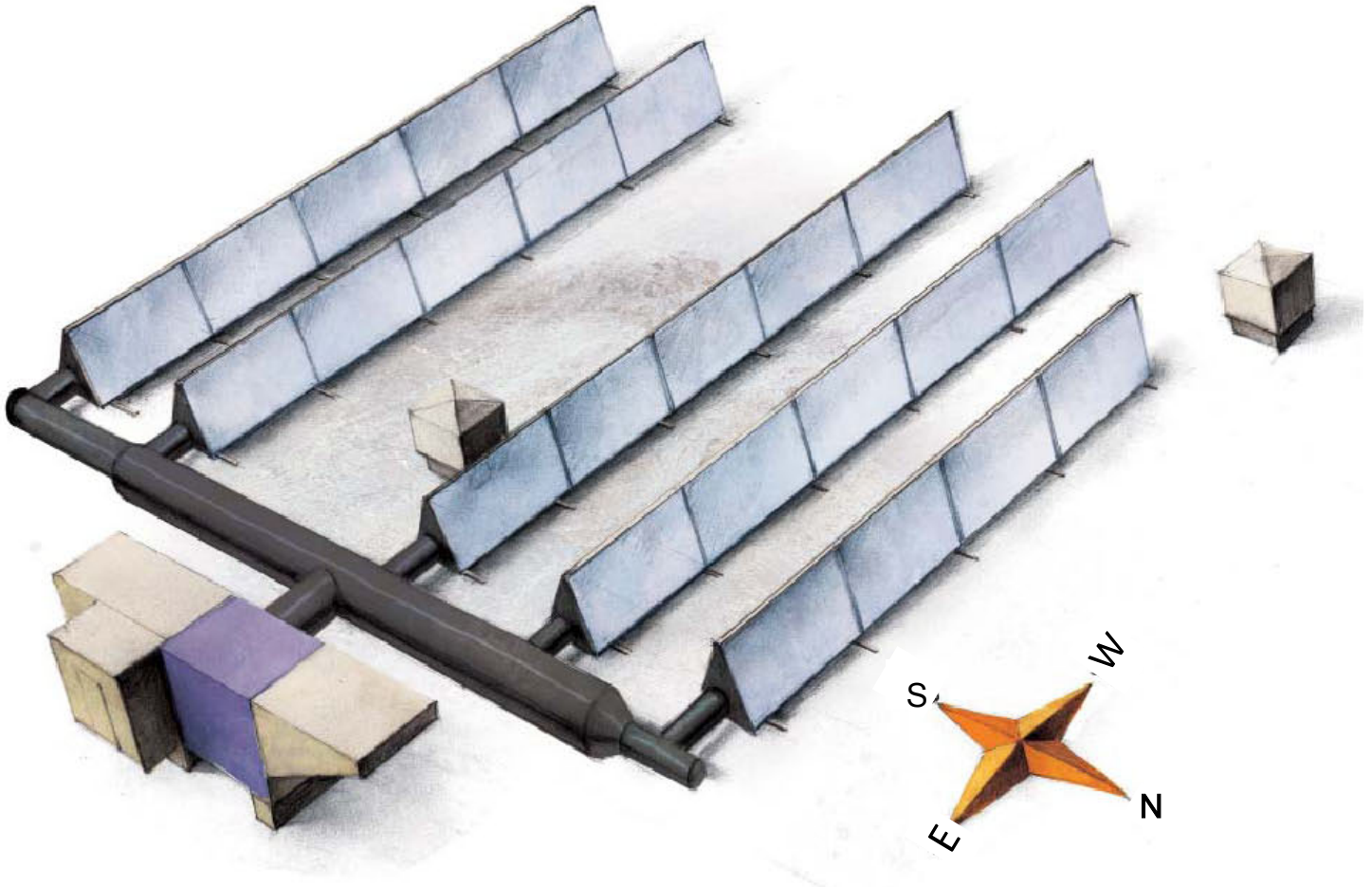


Figure 3. Row of SolarVenti Industrial air collectors connected in series

The length of the collector areas:
The length of a series of solar panels can be a maximum of 20 meters = 10 pcs. SolarVenti Industrial ® collector.

The distance between rows
Because the sun's changing position in different seasons, it is necessary to calculate a minimum distance between rows of collectors. This ensures the best solar radiation in all seasons
The most critical period is around two weeks either side of the winter (Northern) solstice June 20/21, when the sun is low over the horizon.

Recommended minimum distance:
Has to be calculated from the current conditions, avoiding as much as possible shade of winter. Also, one should consider the snow in the winter. In regions with much snow the racks should be extended , meaning that the collectors are placed higher above the roof.

Choosing a location
Sometimes a roof is quite bare, with no obstructions. In most cases, there is something on the roof that should be taken into account. It is important to take account of existing or new ventilation and exhaust systems, chimneys and other
Be careful that no other than fresh, clean air is sucked in through the solar air panels.

Connecting to manifold with throttle valves

To balance the flow of air in each series of SolarVenti Industrial ® collector a damper valve is installed at the beginning of each row.

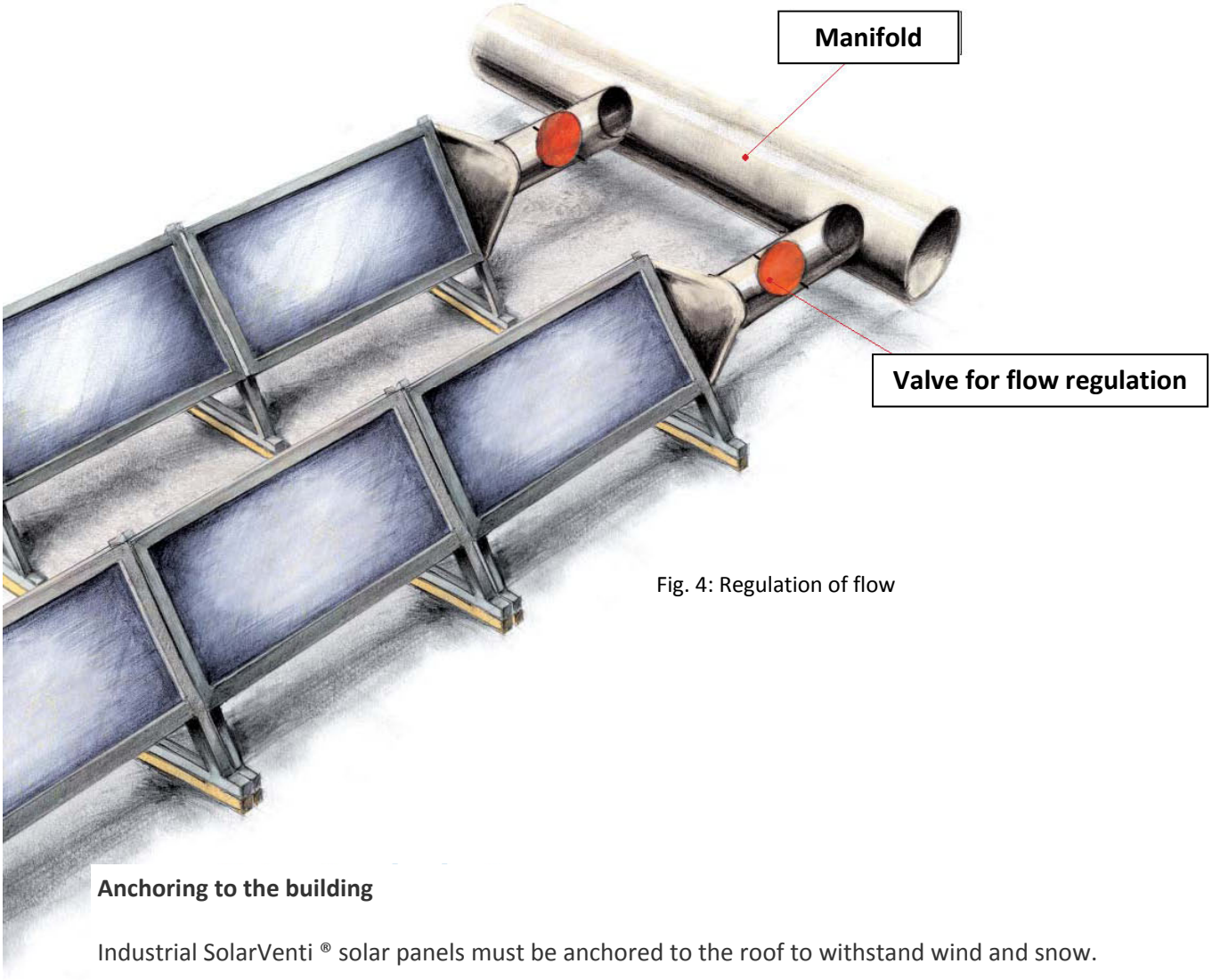


Fig. 4: Regulation of flow

Anchoring to the building

Industrial SolarVenti ® solar panels must be anchored to the roof to withstand wind and snow.

Selection of materials and anchoring of solar collectors for each project depends on:
- The size of the roof with space available for solar panels
- roof construction
- the roof pitch and type of roofing
- static roof load
- Building height and local wind load
- Is there space between the existing components (ventilation hoods, ventilators, chimneys, etc.)
- The composition and size of the existing ventilation system

If the roof does not allow the anchor directly to the roof construction, it is possible to use anchor rods and steel cables that are connected with each other.
The whole system is then fastened to the edge of the roof or the rods can be anchored to the roof or otherwise, so it's completely safe.

In some cases it is necessary to anchor the entire system in a single device.

So we recommend the use of solid, stabilizing metal rods.

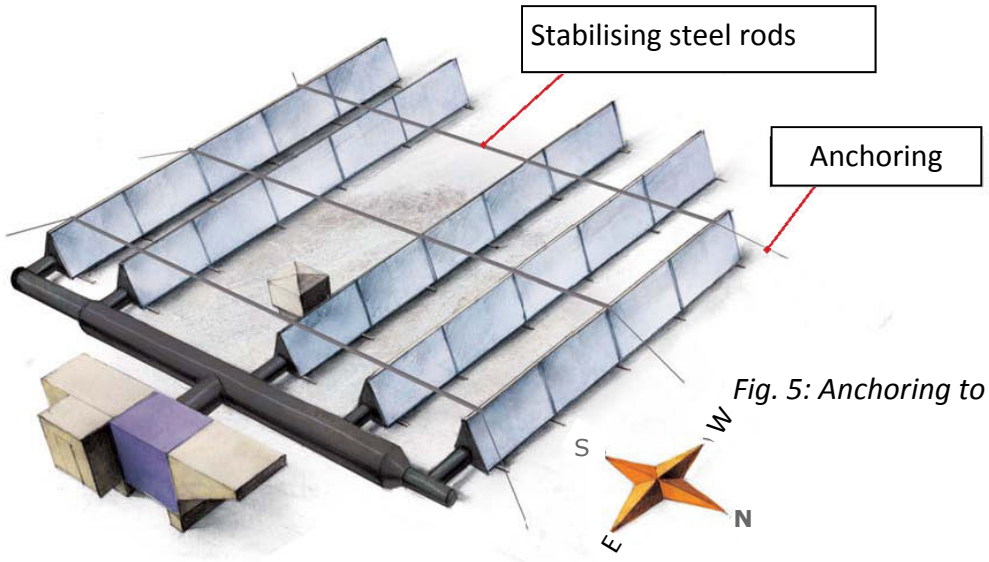


Fig. 5: Anchoring to the roof

Connecting to the ventilation system

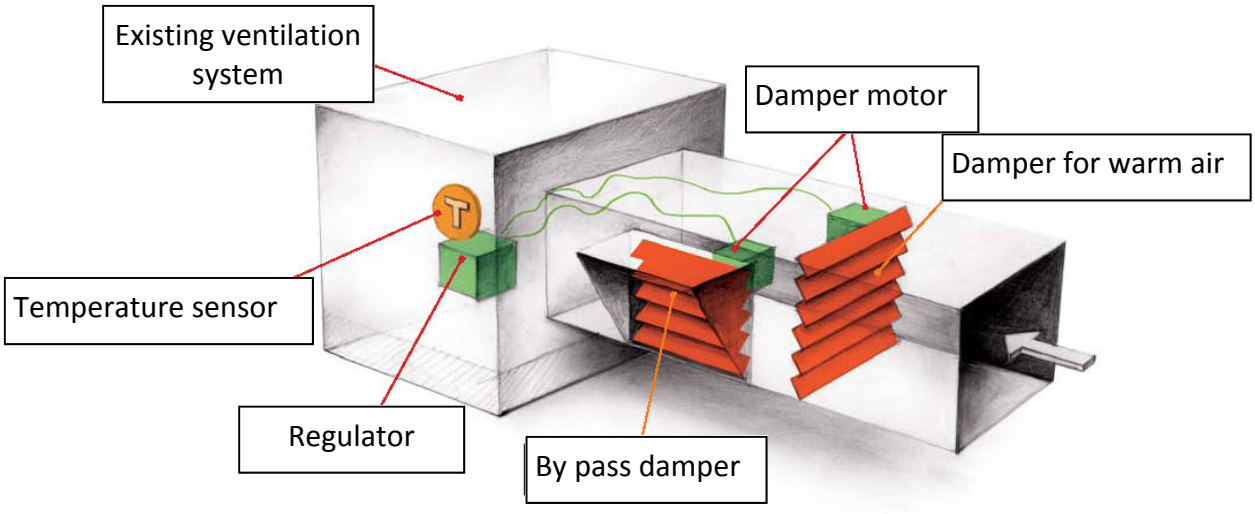
SolarVenti ® Industrial is connected to the existing ventilation system with pipes that has to be insulated. The collectors are either preheating or heating the fresh air to be blown into the building.

- A balancing damper for the intake of solar heated air.
- A balancing damper for the intake of cold fresh air (bypass damper)
- Two actuators
- Temperature sensor to the tube (T)

Solar and bypass dampers are controlled automatically by the control unit and temperature sensors installed in the ventilation duct. The purpose of the air control system is to prevent overheating of the air inside the building.

When the air from the solar panels is too hot, the controller will automatically begin to open the bypass damper.

Through the bypass damper flows the cooler air. The system is thus self regulating to maintain a constant indoor temperature by mixing warm and cold air.



Figur 6. air regulation system

Operation of the system

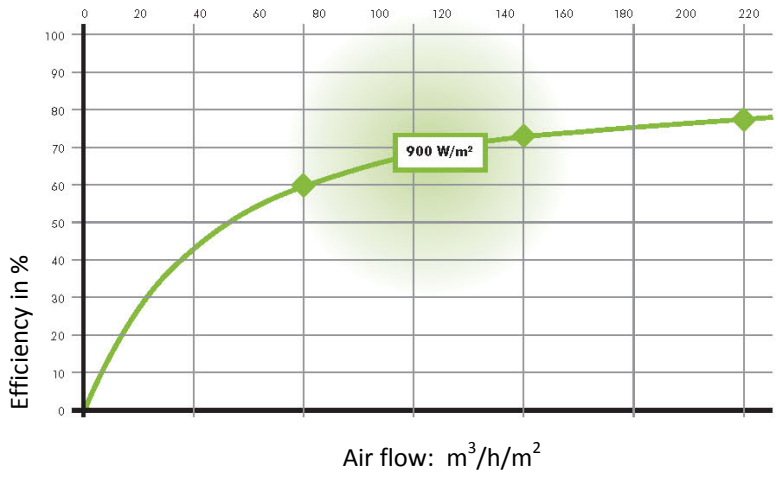
SolarVenti Industrial ® air collectors are designed to operate as "open circuit", which means that they heat the fresh air directly from the outside.
It is not possible to recirculate the air from inside the building into collectors.
SolarVenti Industrial ® can also be installed in front of an air heat pump, a heat recovery or for the most used air heating systems.
In contrast to other solar heating systems, such as water-borne, ***SolarVenti Industrial*** ® requires very little control, etc..
Everything works when the existing ventilation system is turned on.
If the existing ventilation is switched on, fresh air is drawn through ***SolarVenti Industrial*** ® collectors, as long as you need new air and heat. When the desired temperature is reached, normally about 20 - 22 ° C the regulator begins to mix the cold air in the intake air through the by-pass system.

Recommended airflow

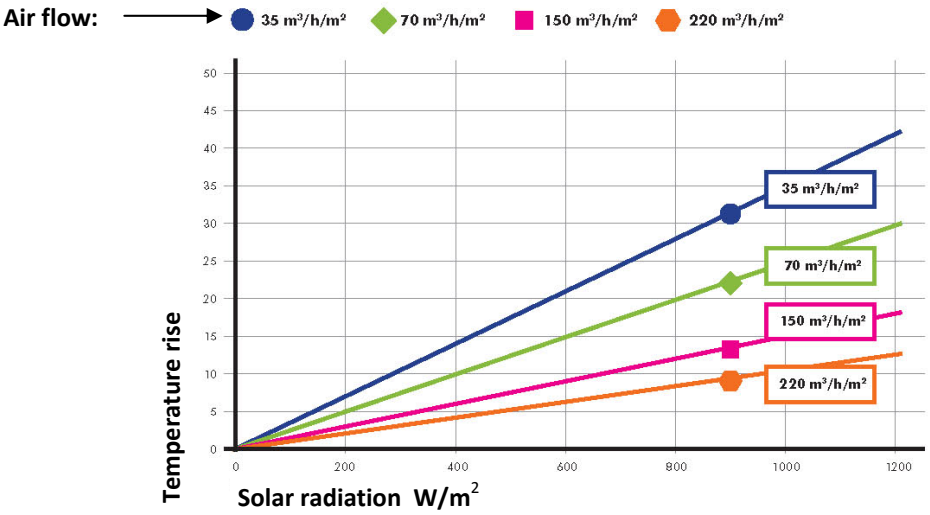
SolarVenti Industrial ® solar panels can work with air flow in the range of 20-220 m³ / h / m² of collector area. From an economic perspective, the optimum air flow 100 to 175 m³ / h / m².
There are situations where it is required to have a higher temperature rise, such as drying or the usage in connection with a heat pump. In these cases, the air flow is less than 80 m³ / h / m², which results in up to 25 ° C increase in temperature above ambient temperature.
Normally, it does not pay off to increase air flow over the 175 m³ / h / m².

Collector efficiency *SolarVenti ® Industrial*

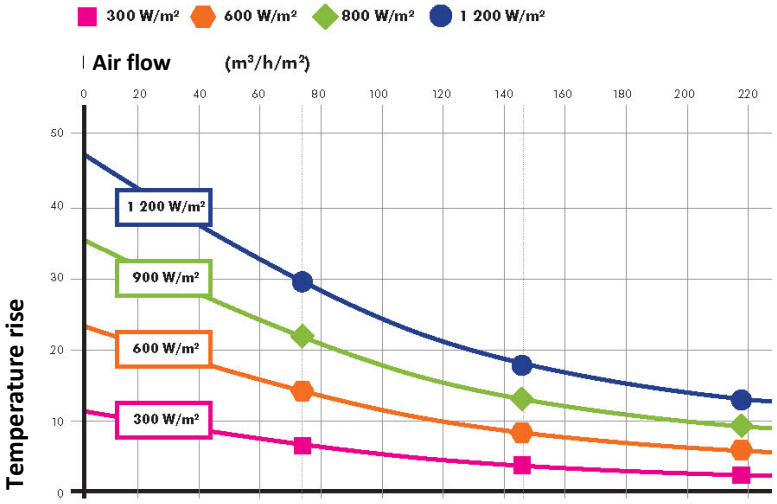
The efficiency rise when
the air flow rise



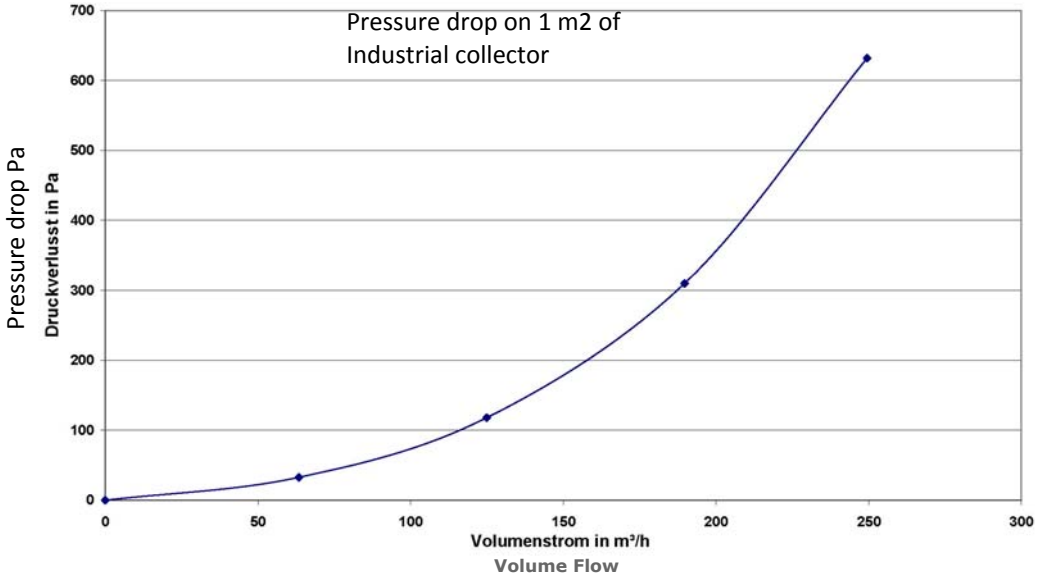
Temperature rise depends on air flow and solar radiation



The same thing shown in another way



Pressure drop 1,261 m²,
Ambient Temp. ca. 20,5 °C, 18.03.2010



Messured by: Fraunhofer Institut

Further information

Cleaning the collector

In most cases, there is enough rain to keep the collectors clean.

However, if there is an abnormal accumulation of dust, leaves or other debris on the transparent part, you can manually clean with a soft, wet sponge. Do not use solvents etc. Not more than a little soap.

The cleanliness of the filter.

This is a particular advantage of the SolarVenti principle.
Filter is also the absorber, and the material can withstand very high temperatures (above 200 C^{o}.). When turning off the fan = air passageway through the collectors while the sun is shining, the temperature rises on the felt for over 80 C^{o}. This high temperature for many hours, will have an antiseptic effect on the filter, which is thereby kept clean for years without special effort.
Usually, you have turned off the intake of hot air the summer in warm periods when the bypass function is active. Then it comes all by itself.
Many years of experience with this technique has shown good results, and ***SolarVenti A/S*** work together with knowledge institutes in various countries, to provide documentation and further guidance regarding to this. The preliminary experience indicates that the filters stay cleaner by turning off the fan once in a while in warm periods.

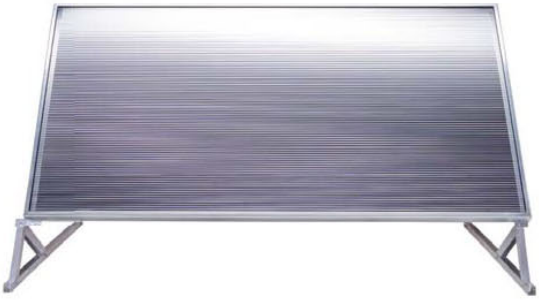
Exclusive distributor for Scandinavia: SolarVenti A / S - also applies to Lubi system.

Warranty

See SolarVenti A / S normal commercial terms.
Separate 10-year warranty on PC cover in terms of light transmission

14 m2 system at Den jyske Håndværkerskole
(Technical scool in Hadsten, Denmark)

Photo Gallery



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Patented Design Solar Air Panels
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SolarVenti® Industrial

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