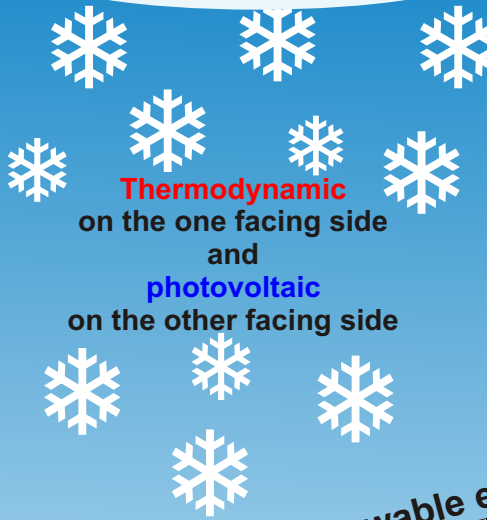


# TP4 - ENERSOL

Weather alterations  
Turn panels to the other side



**Thermodynamic**  
on the one facing side  
and  
**photovoltaic**  
on the other facing side

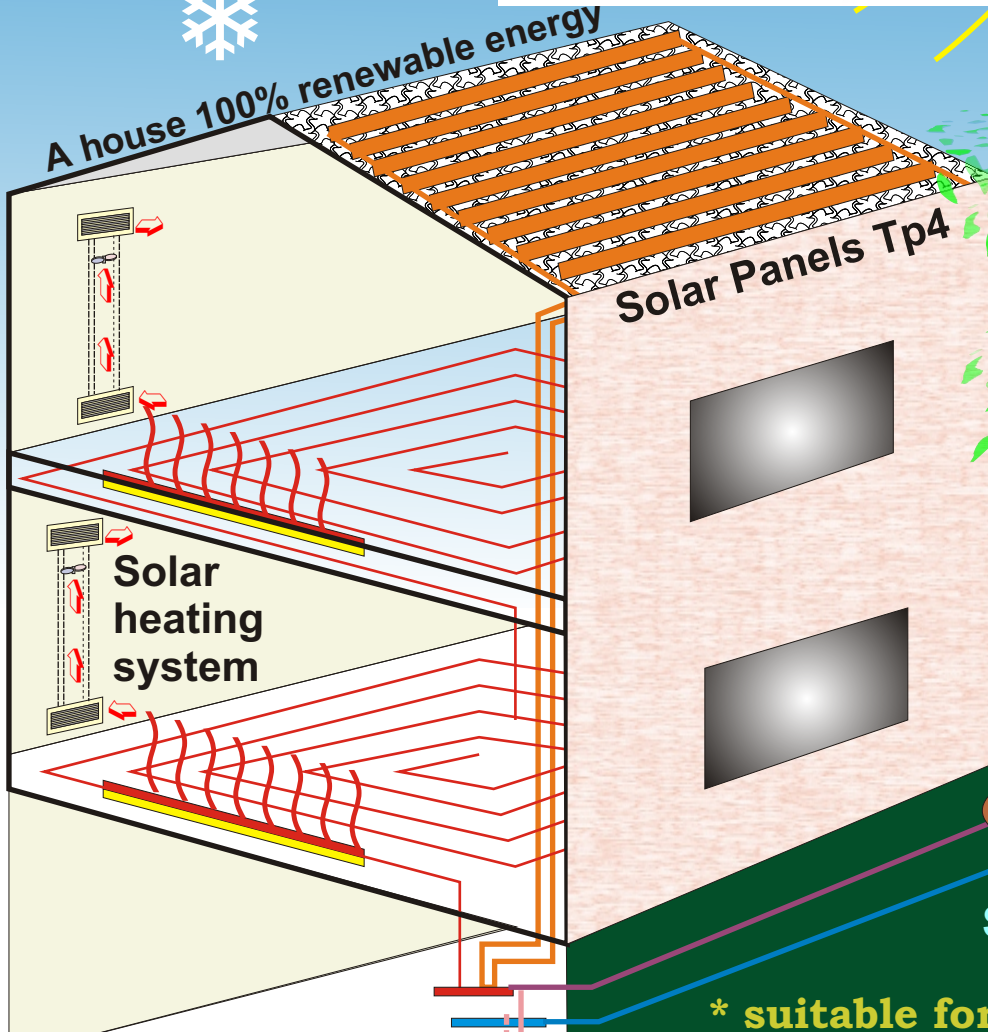


Now also available with PV-modules

## ECOLOGICAL REVOLUTION!!!!

Rotable double faced  
solar collectors TP4  
\* **thermodynamics for  
floor heating systems**  
\*\* **photovoltaics with  
hybrid cooling system**  
\*\*\* **domestic hot water**  
\*\*\*\* **swim pool heating**  
automatic rotability depending  
on seasons and energy needs.

A house 100% renewable energy



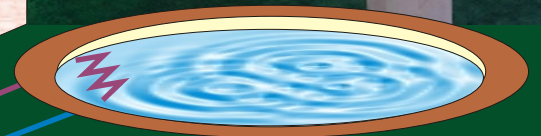
Solar Panels Tp4

Solar  
heating  
system

Heat-Pump  
air to water



Solar pergola



Solar swim pool heating

- \* suitable for floor heating systems
- \* total profile height - only 200 mm
- \* low risk of transportation damages
- \* easy connection by click-couplings
- \* suitable for roof tiled installation
- \* horizontal construction as pergola
- \* vertical positioning on walls etc.
- \* rotatable panels on pipe and fittings
- \* recommended for heat-pump (A-W)



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## The first 'Solar House' without 'visible' solar collectors

This 4-store family house, with a total living area of more than 400 m<sup>2</sup>, has on its declining (-5°) 'flat roof', an installation of 85 pcs solar collectors (35 m<sup>2</sup>) of the new type Enersol-TP4 at an horizontal angle of 45°.

No collectors are visible from the side and the esthetics of the building is not disturbed at all.

The solar energy covers more than 80% of the space heating required for the floor heating system, domestic hot water and the heating of the swimming pool.

Looking at the building from above shows a large area covered with flat solar collectors, positioned almost horizontally on the roof. The ordinary flat plate collectors (red circle) are indeed flat and positioned horizontally at an angle of (-5°) and thus unable to provide sufficient heating output during winter season when the sun stays low on the horizon at an angle of less than 30°.



On the contrary the other supposed horizontal area (green circle) consists of multiple stripes of solar collecting surfaces with an inclination of 45° towards the horizon, effectively collecting the weak solar radiation for heating purposes during the winter period.

That is why they are characterized solar heating collectors because they can produce very large quantities of low temperature water 30° - 50° which is adequate for most floor heating systems.

The prototype design of the solar collectors with one central liquid pipe makes it possible to rotate the collecting surfaces into the most effective angle depending on the inclination of the roof and the geographic latitude of the building.

- \* 60° in northern parts of Europe
  - \* 45° in southern parts of Europe
  - \* 30° in southern mediterranean countries
  - \* 15° if basically used for swim pool shadowing
- Variable tilting of the solar collectors can be obtained automatically by a worm gear drive.



Thanks to the large open air space in between the solar collectors they are not affected by bad weather conditions like strong winds up to 10 beaufort.

They do not easily get covered by snow and if so the snow can rapidly be melt of by accesive heating.

The solar collectors adapts directly to the bearing distribution pipes, which are made in stainless steel.

On flat roof areas the distribution pipes can be kept in place by small concrete foundations and simple pipe fixtures without any needs of drilling holes on the terrace surface.

# Make it yourself

## Installation with special click fitting

It is possible to install and connect the complete solar panel package, by one handy man only, and even without any special plumbing knowledge.

All connections are of type click-couplings which just are pushed together by simple hand power.

The ability of the fittings to be disconnected and reconnected several times, allows the amateur to make mistakes, because they can be corrected. (See technical leaflet for part specification.)



The connection of the panels to the distributing pipe is made on the one side with a straight connector.

First the fitting is pushed onto the solar panel and then the horizontally on to the distribution pipe outlet

The click fittings are all in stainless steel quality Ss316 and the preinsulated distribution pipe in Ss 304

After the necessary water test pressure of the piping all connections must be covered with a small peace of the pipe insulation in order to protect the fittings from the direct sun light.

At the opposite side the connection of the panel to the distribution pipe is made by an angled coupling.

First the fitting is pushed onto the solar panel and then vertically on to the distribution pipe outlet.

The click fittings must always be covered with the self adhesive isolation material in order to protect the fittings from the direct sunlight.

If there is any fixed building part, like a concrete beam or a low wall, it is recommended that the whole panel package is steadily fixed horizontally.



Whenever the package includes a double distribution pipe the the connections starts from the middle pipe.

The double middle pipe is commonly used for the hot water outlet, from the solar panels towards the ackumulator tanks, and should be connected to an automatic air vent and a thermo-relief valve.

The distribution pipes should be stabilized to the small concrete foundations bu pipe fixtures with a rubber protection for the insulation surface.

The pre-insulated distribution pipes are also connected in series by click couplings allowing repeated mounting and dismounting of the panels.

In case of glass damage it is possible to easily disconnect one solar panel and tap the outlets until it is repaired and remounted again.

When the solar panels are installed without the tilting device then the panels are fixed together in groups by parallel distance pieces.



**An estetic solution for ecological buildings**

## Solar pergola for terrace shadowing

A new 4-store family house in Athens was the first building to have the new Enersol-TP4 solar panels installed as a shadowing pergola.

The purpose of installation of solar collectors was in winter period:

- the pre-heating of domestic hot water in a 300 L accumulator tank of triple function with water top heating by direct electricity or by connection to the central air to water heat pump.
- the partial space heating by the installed floor heating system which has separate 3-way valve controls on each level and is combined to the central air to water heat pump.
- the heating of a small indoor swimming pool through an separate heat exchanger also connected to the central air to water heat pump.

During summer period the solar installation covers the complete needs of domestic hot water and the heating of the outdoor swimming pool.

An accesive benefit of the solar pergola is the shadowing of the sitting area on the roof garden as well as the reduction of ceiling temperature,

For the bearing construction of the solar pergola a frame of square steel beams was welded together. The distribution pipe fixtures were then mounted on the steel frame.

To increase the heat output during winter period a additional mounting rail was installed with an 10' inclination towards the south.

The stainless steel distributon pipes, with a c/c=200 mm, were moved up onto the rail and stabilazed with pipe fixtures.

The pre-insulated distribution pipes are available with 4 different c/c e.g. 200-250-333-400 mm between the pipe outlets.

They are available in two types single and double pipe connection as well as in two dimensions 22 mm and 28 mm outer diameter.

All connections are assembled with Tectite click-fittings in stainless steel quality SS-316

The solar collectors are manufactured in extruded aluminium profiles and have a approximate section dimension of 40 x 200 mm available in standard lengths of 1000-1500-2000-2500-3000 mm.

The heat collecting surface underneath the glass cover consists of an (t=1 mm) aluminium plate welded onto a (15 mm) copper pipe with the latest laser welding technology.

Another interesting application for the pergola solar collectors is a free-standing construction for pool-heating and garden-shadowing.

Most other solar collectors causes an estetic pollution and also have serious risks of damages at strong wind conditions.

The Tp4 solar pergola has a very nice appearance and can easily be applied almost anywhere without estetic disturbance.

It can also be positioned vertically on south orientated building walls or as window shadowing protection on larger office buildings.

The solar collectors have the ability to rotate around its main copper pipe and the horizontal angle can easily be adjusted depending on the roof inclination as well as the geographic latitude of the building.

The panels can be turned around in summer time to maintain the shadowing effect without exposing the colleting surface to the sun in order to avoid overheating in warmer countries.

The panels can be turned vertically in winter time in order to avoid thick snow layers in norhtern countries with heavy snow.

An eventual unwanted snow layer on the solar pergola can easily be melted off the surfaces by reversing the flow from the accumulator tank.

Consequently the Enersol-TP4 solar collectors are unic for following:

- Tilted roofs with ceramic tiles etc.

**Can be applied direct to the tiles without any heavy steel frames**

- Flat roofs and terraces etc.

**The low profile hight does not exceed more than 200 mm.**

- Car-port and veranda shadowing etc

**covers and shadows a part of a building without estetic problems .**

- Pool and garden pergola etc.

**covers an area without loosing any ground space .**

**\*\* The product you have been waiting for - is now available \*\***

