



# triple solar



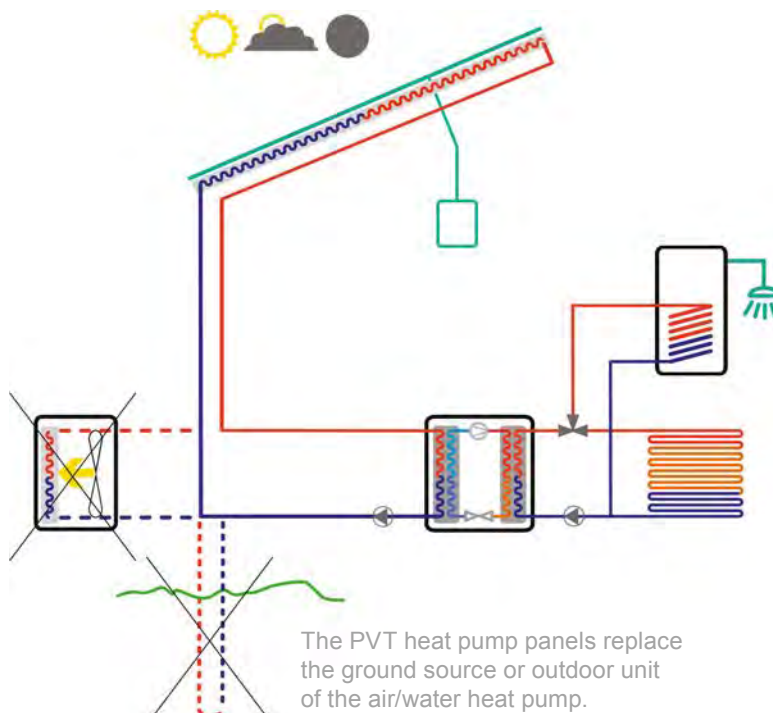
**PVT heat pump &  
PVT heat pump panels**

# Introduction

Triple Solar is the inventor of the innovative PVT heat pump panel and the PVT heat pump. These innovations make it possible to provide a house with heat, cooling, hot water, and electricity in a sustainable way. Without or with less fossil fuel. In every season, 24 hours a day. Thousands of homes have already been connected to a Triple Solar® system.



[www.triplesolar.eu](http://www.triplesolar.eu)



## Mission

Our mission is to achieve maximum impact through reducing of CO2 emissions from home heating. In addition, we want to make energy-saving homes accessible to a wide audience. Therefore, we develop smart, affordable, and maintenance-free solutions in the field of renewable energy.



## 5 advantages in a row

### Low energy use

The Triple Solar® system is very economical with the generated electricity.

The SPF (a.k.a. SCOP) is the measure for energy efficiency on an annual basis. For central heating, an SPF of 5.6 is feasible, for hot water an SPF of 3.8.

### Low TCO over 15 years

The Triple Solar® system guarantees low energy costs, requires minimal maintenance and has a lifespan of over 25 years.

See the cost comparison of four heating systems further on in this brochure.

### Sustainable

Triple Solar scores very highly on sustainability: The panels are produced with European components, are fully recyclable, have a long life span (>25 years), and a low impact on the environment.



### High living comfort

Triple Solar provides great living comfort. The high quality heat pump is as quiet as a refrigerator. Outside no sound is detectable at all.

Should there be a need for cooling? No problem.

Active cooling takes place during warm days with the self-generated solar energy.

### Higher property value

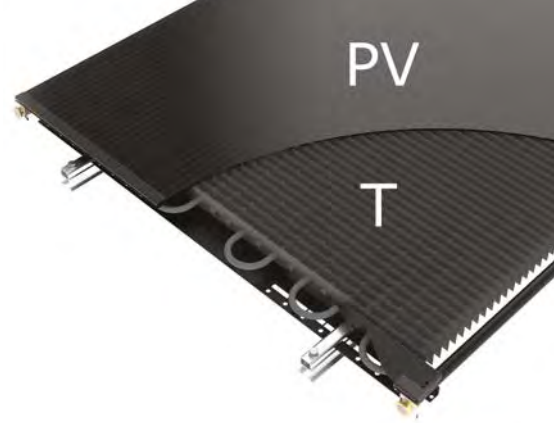
The Triple Solar®PVT panels can be fitted in elegantly and can be complemented with regular PV panels for an aesthetic composition on the roof.

According to research, with every sustainable measure that is at the same time an embellishment, the house value increases up to 5%.

*Save energy with less fossil fuel*

# What is a PVT panel?

The front of the PVT heat pump panel (in short: PVT panel) consists of solar cells (PV) that convert sunlight into electricity. The back of the panel is a thermal exchanger (T) which provides the source energy for the special PVT heat pump. The PVT panel extracts energy mainly from the outside air but also from sunlight and daylight. In all seasons, 24 hours a day, even when it is cloudy or freezing.



## Why a PVT system?

- High efficiency and therefore low electricity costs
- No borehole and thus no climate impact
- No outdoor unit, thus no noise pollution
- Durable with a 10-year warranty
- A life expectancy of 30 years
- Operates 24 hours a day, even in cloudy conditions and at night
- Works all year round, even on cold winter nights
- Suitable for both new and existing buildings
- Suitable for any type of roof
- Low maintenance
- Fully recyclable

## Size

Dimensions (l x w x d)

|              |                  |  |
|--------------|------------------|--|
| PVT M3-450XL | landscape 450 Wp | 2131 x 1055 x 65 mm (2,21 m <sup>2</sup> ) |
| PVT M3-375L  | landscape 375 Wp | 1791 x 1055 x 65 mm (1,85 m <sup>2</sup> ) |
| PVT M3-375P  | portrait 375 Wp  | 1763 x 1071 x 65 mm (1,85 m <sup>2</sup> ) |

For dimensioning a PVT system, ask for our design manual at [info@triplesolar.eu](mailto:info@triplesolar.eu) or ask your wholesaler.



landscape size L or XL



*22 housings near the Delft railway station where the residents jointly opted for PVT panels*

# PVT **all-electric** heat pump

The all-electric Triple Solar® system consists of the PVT heat pump, a 200-liter stainless steel boiler, and a set of four PVT heat pump panels on the roof.

With the natural refrigerant propane the Triple Solar® PVT heat pump uses the latest technology available.

In addition, the PVT heat pump uses the generated electricity very economically.

The heat pump takes up little space and is lightweight compared to other heat pumps.

The accompanying 200-liter hot water boiler has sufficient capacity for showering comfortably, is lightweight, and is made of stainless steel.

The workings of the installation can be controlled with a simple thermostat and monitored via the internet. The heat pump comes with an internal SIM-card and a UTP port.



*The heat pump hardly makes any noise, similar to a fridge*

## Benefits

### For the user

- High efficiency
- Low maintenance
- Low noise
- Environmentally safe refrigerant propane (GWP=3)
- Active cooling
- Extensive monitoring

### For the installer

- Lightest heat pump on the market
- Lightweight boiler
- Small installation area required
- Easy assembly
- Flexible layout of the installation space
- Wall or floor mounting
- 230 VAC

## Size

PVT heat pump 3,5 kW

Dimensions (h x w x d)  
830 x 480 x 450 mm

Weight  
50 kg

Electrical connection  
1 phase, 230 V

Triple Solar® stainless steel boiler 200 l

Dimensions (h x d)  
1487 x 595 mm

Weight  
35 kg (empty)

# New building

New buildings require a variety of solutions. Choosing a heating system is often dependent on the commissioning municipality or on the specific requirements of the location. Dense building in the city requires different solutions than the spacious countryside.

Find below the example of a project in Utrecht where Triple Solar equipped a block of 40 houses with an individual heat pump and PVT panels on the roof, supplemented with extra PV panels.

The goal was a self-sustaining energy-producing building. Drilling was not an option, and there were noise restrictions regarding the desired peace and quiet in the communal courtyard garden.



*Project Ronduit Utrecht - 40 energy-producing homes with PVT panels as the source, supplemented by regular PV panels*

## BENG

The Dutch BENG standard stands for Nearly Energy Neutral Building and is the new standard for calculating the energy performance for new building projects.

Triple Solar scores very well with BENG, because of the high

efficiency in heating, hot water, and the possibility of active cooling. The latter is necessary to avoid a temperature overshoot in July (TO-July).

All values are recorded in the declaration of equivalence. Uniec 3 is the designated software to calculate the energy performance of a building.



For an explanation and detailed instructions, please read the page [www.triplesolar.eu/pvt-paneel-beng](http://www.triplesolar.eu/pvt-paneel-beng)

# PVT hybrid heat pump

## The heat pump

Many homes are not immediately suitable for full fossil free heating. Hence, we have developed a hybrid PVT heat pump to save fossil fuels. This heat pump operates in conjunction with the gas boiler.

If the heat pump can't keep up with the energy request, the gas boiler kicks in, so the house will never cold.

## The 'no-regret' solution

Should in time the dwelling be suitable for fossil free heating, then the Triple Solar®PVT heat pump can easily be expanded to an all-electric solution.

The heat pump is specifically designed for this purpose, so that the investment in the hybrid PVT heat pump will not be lost. Read the explanation below.



## Triple Solar® 1-2-3 system

3 steps: from fossil fuel to all-electric

### Step 1

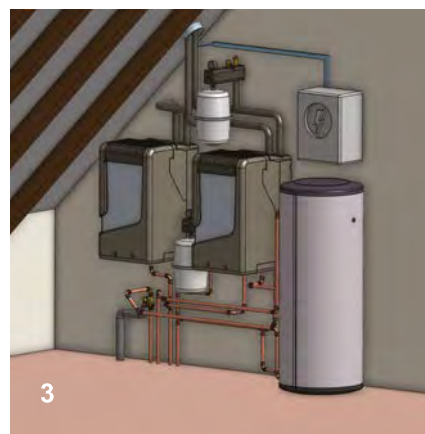
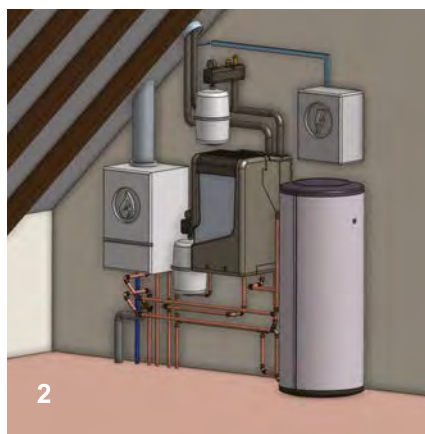
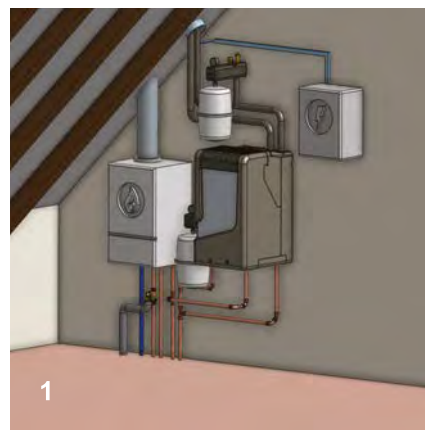
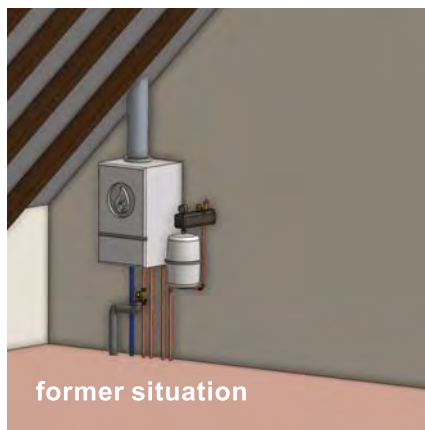
Saving up to 60% gas on heating  
Placing 3 PVT panels on the roof and the 3.5 kW PVT heat pump next to the gas boiler already in place.

### Step 2

Saving up to 80% on heating and warm water  
Installing a 200-liter water heater. The PVT heat pump produces hot tap water in an economical manner.

### Step 3

100% gas-free energy supply  
Installation of 4 additional PVT panels on the roof and replacing the gas boiler with a second 3.5 kW PVT heat pump.



For step 3, the house does need to be fully insulated, and a switch needs to be made to underfloor heating or low-temperature convectors



# The benefits of hybrid

## Economical

The hybrid Triple Solar®PVT heat pump always works, even when it freezes. As a result, it saves more energy than conventional air/water hybrid heat pumps, which stop working below an outside temperature of 4 degrees Celcius.

## Hot water

The PVT heat pump produces hot water all year round. This results in additional savings. Most hybrid air-to-water heat pumps do not produce hot water.

## High living comfort

Triple Solar provides great living comfort. The high quality heat pump and boiler are of low maintenance, and as quiet as a refrigerator. Outside, of course, there is no sound at all.

*save on fossil fuel with your own generated electricity*



# Important questions

Will I get a subsidy?

There are various subsidies available in The Netherlands from both the municipality and the government (RVO). The most important one is the ISDE subsidy for the heat pump which amounts to € 2,800, plus a refund of the VAT on the PVT panels, inverter, mounting material, and the labour costs. It is also possible to obtain a sustainability loan from the government up to € 25,000.

Does PVT work in the winter?

Yes, it does. Triple Solar® heat pump panels do not only gain heat from sunlight, but especially from the outside air, up to an outside temperature

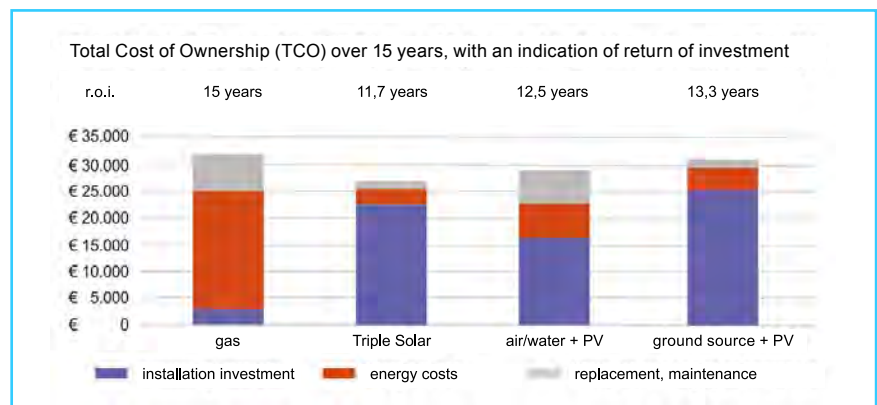
of -10 degrees Celsius. If the temperature drops below that point, the heat pump also provides electric auxiliary heating.



## TCO

Low Total Cost of Ownership over a period of 15 years

On the right you find a comparison of the costs of various systems for a single-family house.



The Triple Solar® system results in low energy costs, requires minimal maintenance and has a lifespan of at least 25 years, making the total cost of ownership (TCO) low for the entire 15-year period.

Gas is obviously the most expensive. The air/water heat pump scores unfavourably due to the high electricity usage and because the outdoor unit needs to be replaced after 10 to 12 years.

Ground source energy scores poorly due to expensive boreholes and the environmental impact of the 150-meter-long plastic pipe that is pounded into the ground.

# Monitoring

For the resident

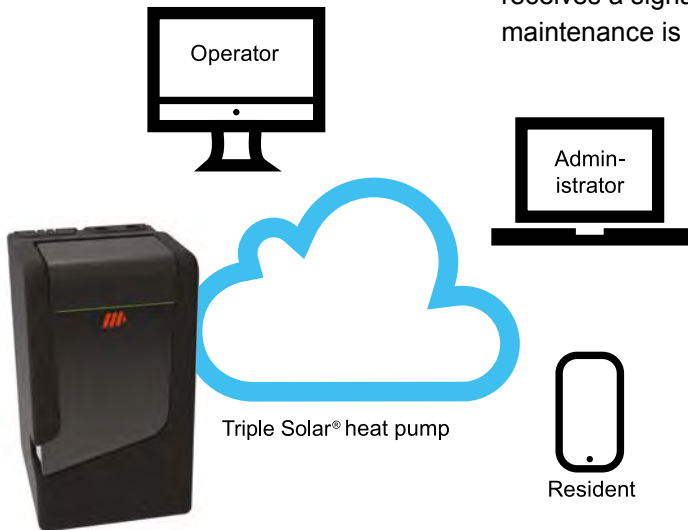
The resident obviously wants to know whether his heat pump is working properly and therefore wants to know the running costs.

For the administrator

The installer or the service organization can check whether the heat pump is working properly and whether its performance is satisfactory. Plus, the installer automatically receives a signal when preventive maintenance is required.

For Triple Solar

If required, we can take a look and give advice to the installer and/or the user. This insight into the installation provides greater certainty and guarantees an efficient long lasting operation.



# Where to buy?

## The installer

The Triple Solar® system is placed by the installer. The installer is your point of contact and gives a guarantee of operation. Triple Solar will advise with tips & tricks.

## The wholesaler

The installer buys the PVT heat pump and the PVT panels as a package from the wholesaler. This is the cheapest and most efficient way.

The wholesaler also supplies all additional mounting materials needed. This way, the installer does not have to buy from different places and there is only one sustainable transport.



# Where are we?

## The office

Programmeurstraat 6-B  
1033 MT Amsterdam  
020 435 75 55  
info@triplesolar.eu  
www.triplesolar.eu



## The factory

Our PVT panels are produced in Emmen according to ISO 9001 and Solar Keymark.

