



PROJECT DESCRIPTION *Updated*

Single Family Home

System: AC•THOR 9s and my-PV Power Meter
Operation mode: Hot water and space heating
Location: Upper Austria



Project data

- 10,98 kWp photovoltaics
grid-connected, South-facing, 45° inclination
- 300 l hot water tank, immersion heater 3 kW,
linear power control by AC•THOR 9s
- 150 m² living space, electric floor heating,
linear power control by AC•THOR 9s
- Space heating energy demand 50 kWh/m²a

Description

In a new single-family home, AC•THOR replaces the conventional building installation and enables both hot water and space heating with solar power. It uses the excessive yields of a grid-connected photovoltaic system by linear power control of the electric heaters. Missing energy is drawn from the public electricity grid.

In spring 2020, the AC•THOR was changed to AC•THOR 9s for up to 9kW control power.

750 Euro annual operating costs

The family of three is paying only 750 Euro (excluding VAT) a year for their 150 m² single-family home for electricity, hot water and space heating. A comparable low-energy house with a heat pump would have annual operating costs around 100 % higher. The building technology follows the solar-electrical concept, which works with today's standard thermal insulation. This means that low-energy houses can be supplied cheaply with solar electricity by combining a PV system and a device for intelligent, linear controlled energy.

"It's a dream! Thanks to my-PV, we can operate our house almost entirely solar-electrically and reduce our energy costs by 49 percent," the builder-owner said happily when he sent us a photo of his annual electricity bill.

Low electricity consumption

The family from Upper Austria had a very low grid consumption of 7,658 kWh, considering that the family not only supplies electricity for lighting and all household consumers, they also use it for space heating and hot water. In addition, the family of three fed around 6,700 kWh into the public power grid during the billing period.

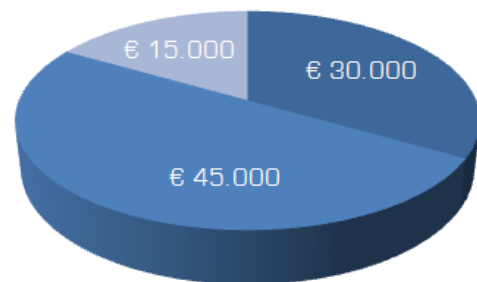
In the original planning, annual operating costs of 970 Euro were predicted, this value now turns out to be even more favourable in real operation!

Official requirements

As required in Upper Austria, the family also has a non-electric heating system. In December and January 2020, the wood stove was used to heat a scarce solid cubic metre of beech wood worth 80 Euro for the purposes of cosiness. These 80 Euro have been added to the annual electricity bill of 670 Euro.

The 100,000 Euro home

The owners managed to realize their personal living dream with a construction budget of less than 100,000 Euros. This objective could not be achieved with a conventional, water-based heating system. The second goal was to keep the later operation low-cost and sustainable.



- Foundation
- Building (wooden frame, self-made)
- PV und installation incl. E-Boiler and E-heating mats

Figure: Investment costs



Low-energy houses with up to 150 m² can be easily and cheaply supplied with photovoltaic energy by combining a PV system and AC•THOR 9s.

Why „cable instead of pipes“?

In a building, which is built or renovated according to today's standards, water-based heating systems are oversized. High cost of material and time for installation are no longer up to date.

“Cables instead of pipes" make the system much simpler and cheaper. A feature that also has significant effects on maintenance costs.

Functionality

The my-PV Power Meter detects energy flows of the PV system. Via Ethernet it transmits excess energy data to AC•THOR 9s PV-Power-Manager. As a result, only energy that is currently available is used to generate heat. Power feed-in is avoided as much as possible. PV self-utilization ratio is maximized and the public power grid is relieved.



Figure: The my-PV Power Meter is mounted in the distribution cabinet directly after the utility meter.



Figure: AC•THOR 9s display with status indicators

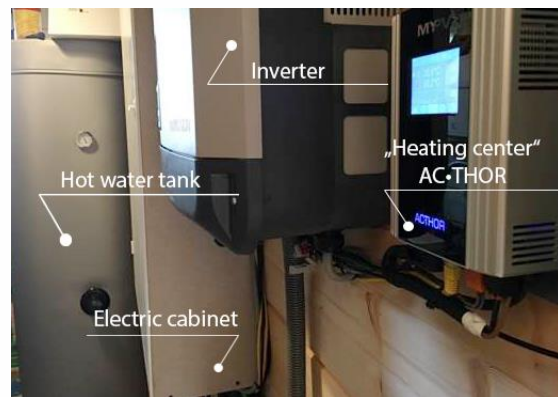


Figure: The entire building installation in a very small space

Builder: "Photovoltaic has become so cheap that we decided with conviction to carry out the building installation completely PV powered. It is low-cost and easy to install and we save money in operation."

Product details AC•THOR 9s



- 0 – 9,000 W linear power control
- Maintenance-free by “cable instead of pipes” (less plumbing)
- Minimum space requirements
- System openings for various inverters, battery systems and SmartHomes
- Easy installation, user-friendly
- Allows affordable living also in residential construction