

Photovoltaic water heating controller KTR4

Photovoltaic modules can successfully be used to generate electricity for a water heater
2 kW solar modules generate as much as 2 solar thermal collectors
with surface 2m² for the same price, but with many advantages



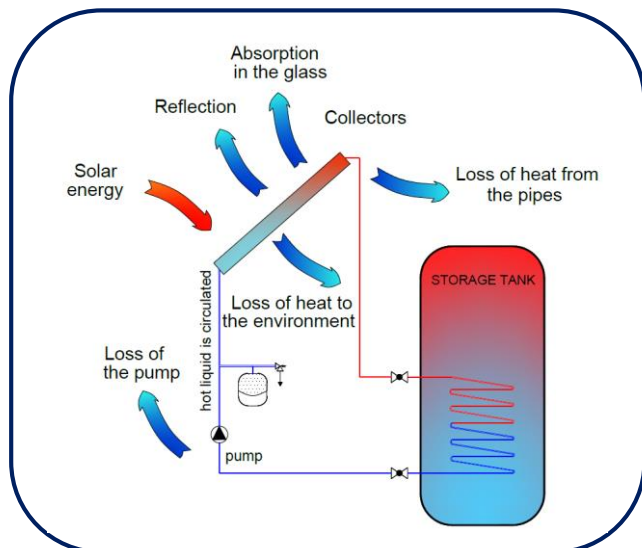
- better proportion between summer and winter yielded energy (ratio 4:1) as by flat solar thermal collectors (ratio 13:1), for latitude 45°-50°,
- simple installation with a cable instead of isolated pipes,
- no pipes, valves, pumps, fluid, no fluid leaking and boiling during your holidays,
- solar modules are completely resistant to hail,
- lifespan of solar modules is more than 40 years, with almost no maintenance costs,
- no connection to electric grid is necessary
- greater distance between solar modules and water tank is possible.

Efficiency comparison

Solar thermal collectors:

Highest efficiency is reached by warm surrounding air and cold water in the tank.

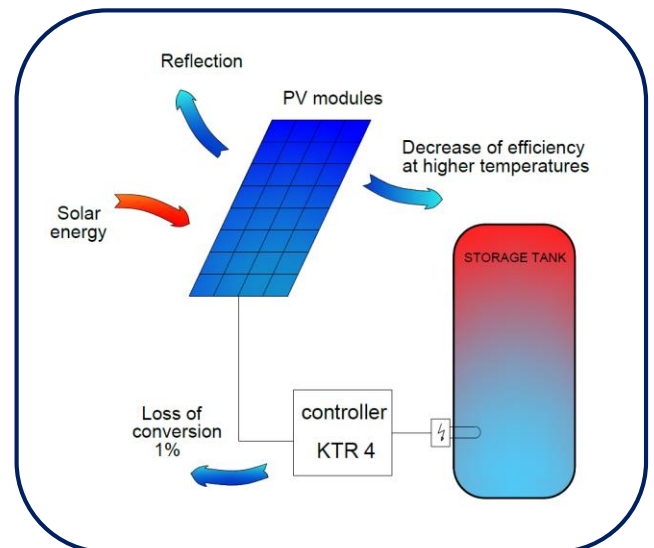
The efficiency drops with the raising water temperature in tank and cooling the surrounding air especially by wind.



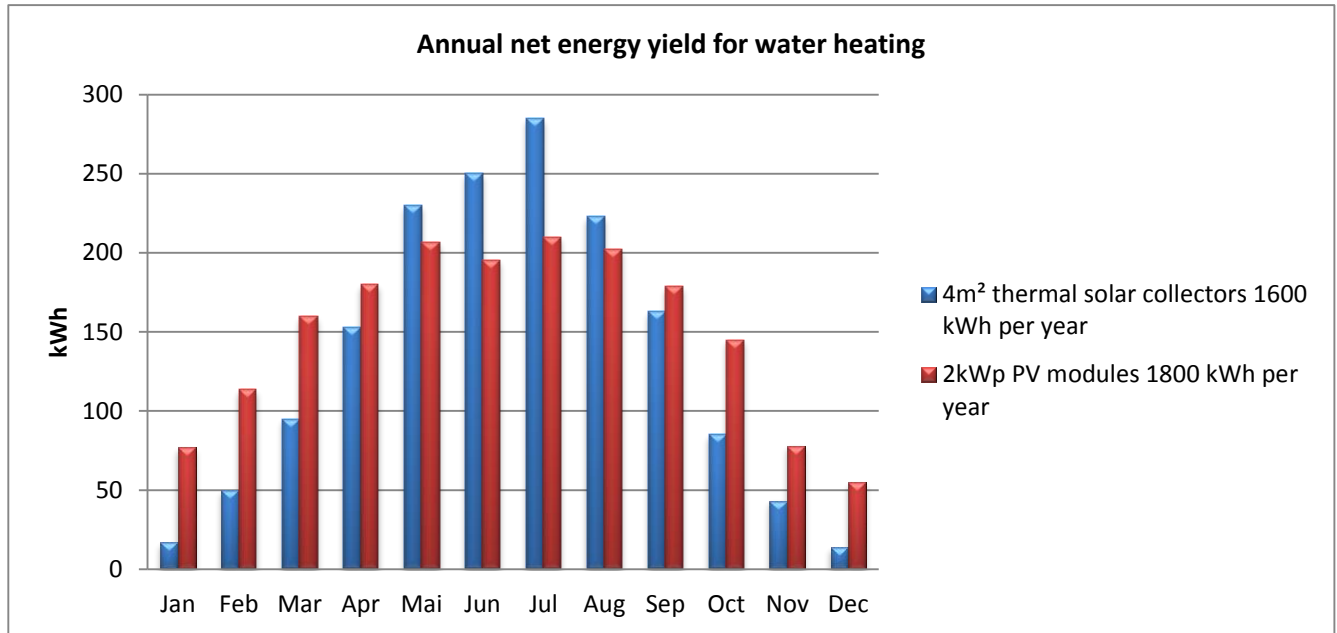
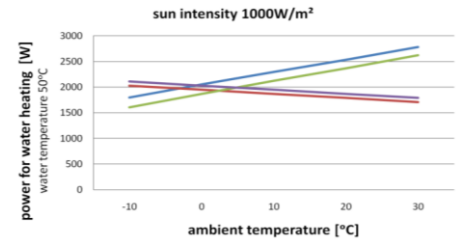
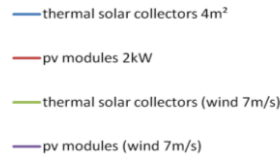
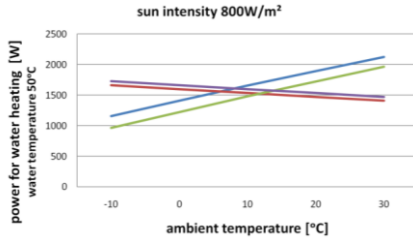
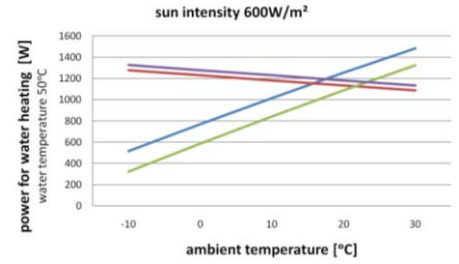
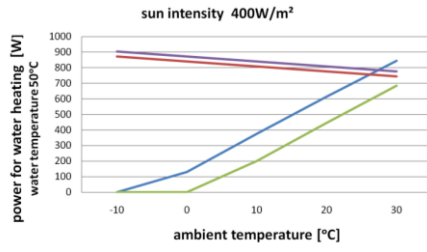
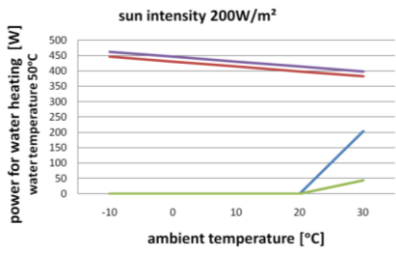
Photovoltaic modules:

Highest efficiency is reached in cold and windy weather.

Nearly all (99%) energy from PV modules flows through the resistive heater regardless of the water temperature.



Efficiency graphs



Photovoltaic water heating controller KTR4



Technical description

Solar water heating controller KTR4 powers resistive heater up to 4,5 kW out of PV generators up to 4kWp in heating water tanks and other heating devices.

The controller converts DC voltage from PV modules into alternating voltage for supplying the resistive heater.

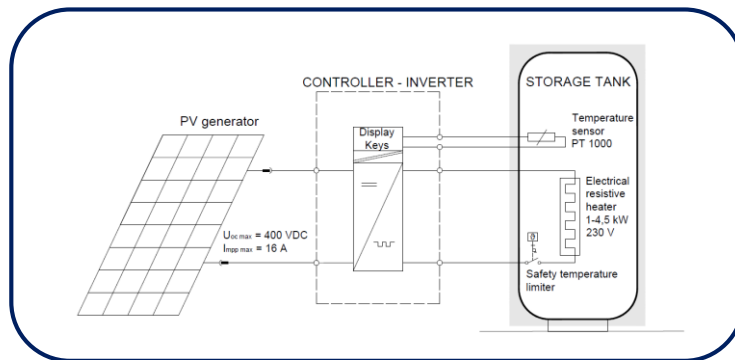
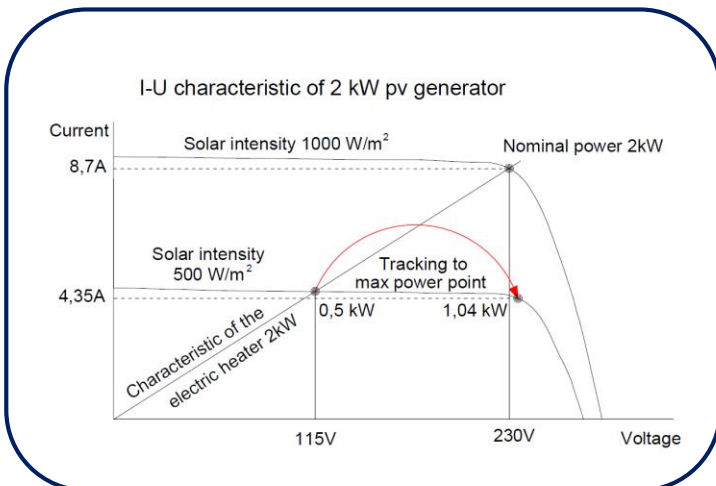
Microprocessor controls the inverter in a way, that current maximum power peak (MPP) of solar generator comes to the resistive heater.

The controller has two power outputs:

- the output 1 is connected to the prior heater
- the output 2 is connected to the heater, which uses the redundant energy.

The controller has two measuring inputs. Each of the inputs is connected to the temperature sensor PT1000, which is built in the heating device.

Integrated temperature controller makes sure that the temperature in the heating device is not higher that the set maximum temperature.



Controlling elements

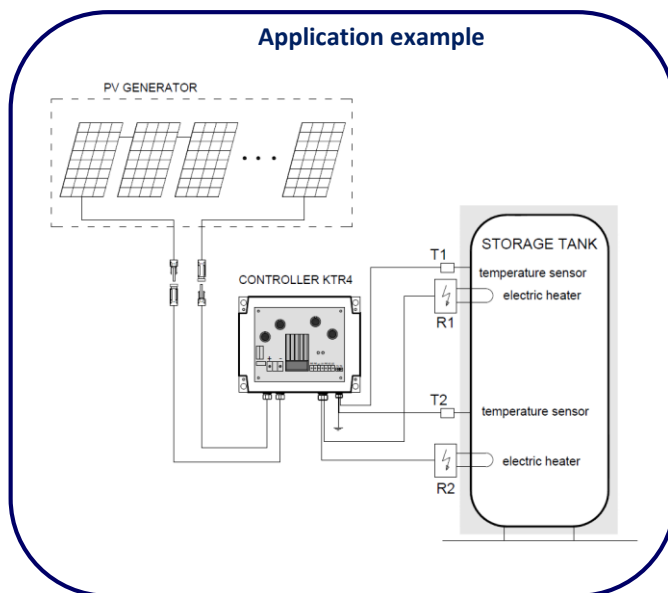
The controller has a dashboard with three buttons and following functions:

- Turn on/ Turn off,
- setup of the maximum temperature of both heaters,
- setup of the power of both heaters,
- data reading,

The LCD display shows:

- water temperature in the water tank and its current power,
- daily generated and total generated energy,
- daily maximum power,
- current power, input voltage, input current,
- set values

Option: WiFi connection



Technical data

Set up parameters		
Language option default (other languages optionally)		slovensko, english, deutsch, hrvatski
Maximum temperature of heated water T1		20-90 °C
Maximum temperature of heated water T2		20-90 °C
Power of electric heater 1		1000-4500 W
Power of electric heater 2		1000-4500 W
Limits of PV generator (STC)		
P _{mpp} _{max}	Peak power of solar modules	4500W
I _{mpp} _{max}	Maximum power point current	16A
U _{mpp} _{max}	Maximum power point voltage	270 V
U _{mpp} _{min}	Minimum power point voltage	210 V
U _{OC} _{max}	Maximum open circuit voltage	340V
U _{OC} (-25°C)	Maximum open circuit voltage at low temperature	400V
Output characteristics		
PL _{max}	Maximum power of the connected resistive heater 230V	4500W
η	Efficiency of conversion at the longterm use	>98%
TL	Maximal value of the controlled temperature	90°C
Mechanical characteristics		
Dimension without cable glands LxWxH		240x191x158mm
Weight		2,8kg
Ambient storage temperature		-30°C - +70°C
Ambient usage temperature		-10°C - +40°C
Air humidity at storage (non condensing)		20% - 90%
Air humidity at usage (non condensing)		10% - 95%
Standard and certificate		
Product standard		EN 62109-1 in EN 60950-1
EMC		EN 61000-6-1EN 61000-6-3

We hold the right to changes due to the technical development and delivery options.

Production and maintenance

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