

fothermo
use the power of the sun

PHOTOVOLTAIC WATER HEATING



PRODUCT CATALOGUE

ABOUT FOTHERMO



Manuel Masenko,
CEO

The cost of producing hot water with a classic electric boiler often ranges between 400 and 700 euros per year. Furthermore, this production is usually associated with the release of large amounts of climate-damaging CO₂. At the same time, prices for photovoltaic modules are falling steadily.

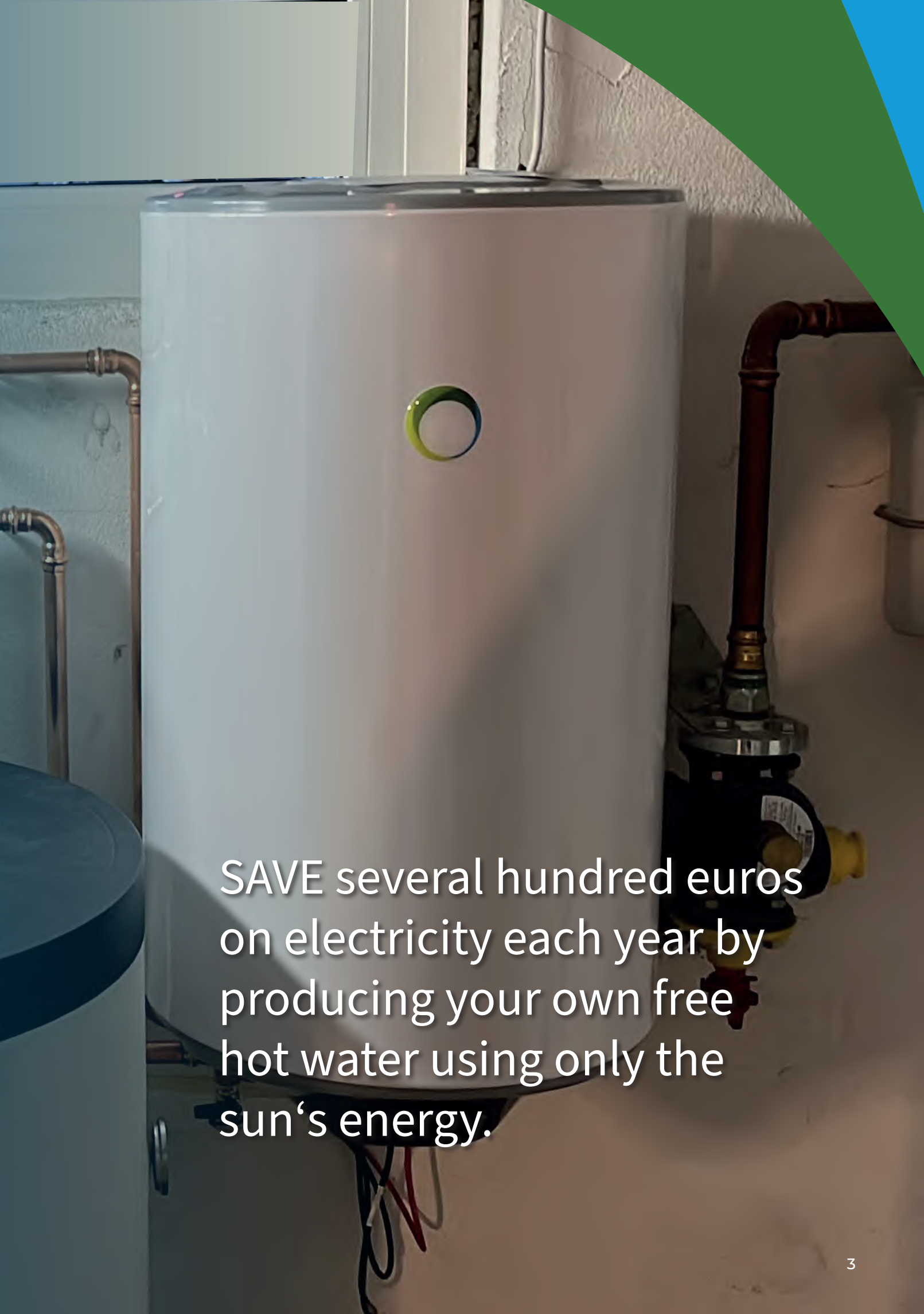
In 2020, together with prof. Adelman, a successful photovoltaic technology entrepreneur, we founded fothermo System AG and set ourselves the task of creating a new and sustainable option for photovoltaic hot water production.



Prof. Peter Adelman,
Chairman of the Supervisory Board

FOTHERMO HAS A MISSION

fothermo products enable cost-effective, independent, and sustainable hot water production. To achieve this, we develop reliable and simple solutions that can be installed and commissioned without any technical knowledge.

A white cylindrical solar water heater tank is the central focus, mounted on a wall. It features a green and blue circular logo on its side. To the right, a complex assembly of copper pipes and a gas valve is visible, connected to the tank. The background shows a textured wall and a window frame. A green and blue triangular graphic is in the top right corner.

SAVE several hundred euros on electricity each year by producing your own free hot water using only the sun's energy.

ADVANTAGES

The photovoltaic boilers provide inexpensive and CO₂ free hot water for your home. Make yourself more independent from rising energy prices.

CO₂ NEUTRAL ENERGY SUPPLY

CO₂ neutral hot water through the power of the sun - this is how sustainability works.

REGISTRATION FREE

Photovoltaic modules do not need to be registered, as no electricity is fed into the grid.

99% EFFICIENCY

The patented power electronics ensures maximum efficiency.

PLUG & PLAY

Direct connection of the photovoltaic modules to the water heater.

*Without inverter or battery



INDEPENDENCE

from your energy supplier and the rising energy prices.

PROTECTIVE EXTRA-LOW VOLTAGE

The entire system operates in the protective extra-low voltage. Installation without electrician possible and allowed.

LOW-COST ENERGY STORAGE

Up to 17.4 kilowatt hours can be stored cheaply in a 300L water heater. In the 80L water heater up to 4.6 kilowatt hours. The energy generated in the photovoltaic modules no longer needs to be purchased from the electricity supplier, thus reducing your electricity bill.

PRODUCE YOUR OWN HOT WATER! REDUCE YOUR HOT WATER COSTS BY UP TO 75%.

For a 2-person household with an 80-liter photovoltaic water heater, about 75% of the energy needed for hot water is covered by the photovoltaic modules. This is about 600 - 900 kWh per year.

FOTHERMO PRODUCTS



10L – 80L Photovoltaic Offgrid Water Heaters
Page 6



30L & 80L Photovoltaic Hybrid Water Heaters
Page 8



200L – 300L Photovoltaic Water Heaters
Page 10



Photovoltaic Caravan Water Heater
Page 14















PV-Heating Rod
Page 16



Switching Device
Page 18

 **PATENTED & ENGINEERED
IN GERMANY**

| APPLICATION | CAMPING | 1 PERSON HOUSEHOLD | 2 PERSON HOUSEHOLD | 2 - 5 PERSON HOUSEHOLD |
|--------------------|---|---|---|---|
| 10 LITER / CARAVAN |  | | | |
| 30 LITER | |  | | |
| 80 LITER | |  |  | |
| 200 LITER | |  |  |  |
| 300 LITER | | |  |  |
| HEATING ROD | |  |  |  |



OFFGRID PHOTOVOLTAIC WATER HEATER 10 LITER, 30 LITER & 80 LITER

Hot water through the power of the sun

The photovoltaic water heater offers the ideal solution for a cost-effective and sustainable hot water supply in stand-alone systems e.g. garden houses, mountain huts or as drinking water preheating before a heating system.

Once installed, the boiler produces free hot water only through the power of the sun.



EXTRA LOW VOLTAGE

Due to the low voltage level of less than 50 V, no electrician is required for installation.



EASY INSTALLATION

The photovoltaic modules are connected by simple plug-and-play connections.



OFFGRID

Hot water supply independent of the 230V mains supply. Photovoltaic energy can be used even without a 230V connection.



INNOVATIVE MPP TRACKER

50% higher yield thanks to innovative MPP tracker that always ensures the maximum yield of the PV modules.



QUALITY

Highest quality and safety standards due to safety temperature limit, magnesium anode, enameled protection and non-return valve.



GOOD FEELING

Enjoy the good feeling of a free and 100% environmentally friendly hot shower.

| | UNIT | 10 LITER | 30 LITER | 80 LITER |
|--|-----------------|------------------------------------|----------------|------------|
| PHOTOVOLTAIC WATER HEATER | | | | |
| Product model | – | PVB-10 | PVB-30 | PVB-80 |
| Volume | l | 9,5 | 29 | 77 |
| Rated pressure | MPa | 0,7 | 0,7 | 0,7 |
| IP class | – | X1 | 24 | 24 |
| Gross weight (± 3%) | kg | 7,2 | 15 | 25 |
| Dimensions (length, width, height) | cm | 28 x 28 x 44 | 40 x 40 x 60 | 47x48x90 |
| Check and pressure relief valve | – | ✓ | ✓ | ✓ |
| Cathode protection | – | ✓ | ✓ | ✓ |
| Emailed protection | – | ✓ | ✓ | ✓ |
| Insulation | – | ✓ | ✓ | ✓ |
| Water connection | – | G½ (M) | G½ (M) | G½ (M) |
| Integrated reverse polarity protection | – | ✓ | ✓ | ✓ |
| Digital display | – | ✓ | ✓ | ✓ |
| CE - certified | – | ✓ | ✓ | ✓ |
| PHOTOVOLTAIC INPUT | | | | |
| Max. photovoltaic heating power | W | 550 | 550 | 550 |
| Max. photovoltaic current consumption | A | 15,5 | 15,5 | 15,5 |
| Max. water temperature | °C | 65 | 65 | 65 |
| Integrated MPP tracker | – | ✓ | ✓ | ✓ |
| Recommended photovoltaic power | W _p | 100 – 300 | 300 – 600 | 600 – 1200 |
| Max. connected photovoltaic power | W _p | 2000 | 2000 | 2000 |
| Max. open circuit voltage | V _{oc} | 42,4 | 42,4 | 42,4 |
| Photovoltaic connector | – | MC4 | MC4 | MC4 |
| REHEATING VIA 230 V POWER GRID | | | | |
| Type of reheating | | Power supply unit(12V, 18V or 24V) | | |
| Heating power | W | 60 (12V), 160 (18V) or 240 (24V) | | |
| Adjustable water temperature range | °C | 10 - 65 | 10 - 65 | 10 - 65 |
| HEATING VIA RECHARGEABLE BATTERY | | | | |
| Recommended technology | | LFP, lead-acid | LFP, lead-acid | |
| Voltage level | V | 12 or 24 | 24 | |
| WATER HEATING DEPENDING ON THE CURRENTLY AVAILABLE PHOTOVOLTAIC POWER | | | | |
| 200 W | °C/h | 18 | 6 | 2 |
| 400 W | °C/h | 36 | 12 | 4,5 |
| 550 W | °C/h | 50 | 16 | 6 |



HYBRID PHOTOVOLTAIC WATER HEATER 30 LITER & 80 LITER

Hot water through the power of the sun

The photovoltaic hybrid water heater offers the ideal solution for a cost-effective and sustainable hot water supply in your home. Hot water represents 20-40% of a home's energy consumption. fothermo water heaters are the easiest way to harvest the sun's energy directly. Once installed, the water heater produces free hot water through the power of the sun. The photovoltaic water heater with its strong performance serves as a replacement for a classic electric water heater. Automatic reheating via the electricity grid in case of bad weather ensures sufficient hot water even on days without sunlight.



EXTRA LOW VOLTAGE

Due to the low voltage level of less than 50 V, no electrician is required for installation.



EASY INSTALLATION

The photovoltaic modules are connected by simple plug-and-play connections.



INDEPENDENCE

Hot water supply independent of the 230V mains supply. Photovoltaic energy can be used even without a 230V connection.



HOT WATER GUARANTEE

A second 230V heating element with 1 500 W ensures hot water even on days with low sunlight or at night.



QUALITY

Highest quality and safety standards due to safety temperature limit, magnesium anode, enameled protection and non-return valve.



INNOVATIVE MPP TRACKER

Integrated MPP tracker that always ensures the maximum yield of the PV modules.

| | UNIT | 30 LITER | 80 LITER |
|--|-----------------|------------------------------|--------------|
| PHOTOVOLTAIC WATER HEATER | | | |
| Product model | – | PVB-30-AC | PVB-80-AC |
| Volume | l | 29 | 77 |
| Rated pressure | MPa | 0,7 | 0,7 |
| IP class | – | 24 | 24 |
| Gross weight (± 3%) | kg | 15 | 25 |
| Dimensions (length, width, height) | cm | 40 x 40 x 60 | 47 x 48 x 90 |
| Check and pressure relief valve | – | ✓ | ✓ |
| Cathode protection | – | ✓ | ✓ |
| Emailed protection | – | ✓ | ✓ |
| Insulation | – | ✓ | ✓ |
| Water connection | – | G½ (M) | G½ (M) |
| Integrated reverse polarity protection | – | ✓ | ✓ |
| Digital display | – | ✓ | ✓ |
| CE - certified | – | ✓ | ✓ |
| PHOTOVOLTAIC INPUT | | | |
| Max. photovoltaic heating power | W | 550 | 550 |
| Max. photovoltaic current consumption | A | 15,5 | 15,5 |
| Max. water temperature | °C | 65 | 65 |
| Integrated MPP tracker | – | ✓ | ✓ |
| Recommended photovoltaic power | W _p | 300 – 600 | 600 – 1200 |
| Max. connected photovoltaic power | W _p | 2000 | 2000 |
| Max. open circuit voltage | V _{oc} | 42,4 | 42,4 |
| Photovoltaic connector | – | MC4 | MC4 |
| REHEATING VIA 230 V POWER GRID | | | |
| Type of reheating | | directly via the wall socket | |
| Heating power | W | 1500 | 1500 |
| Adjustable water temperature range | C° | 10 - 65 | 10 - 65 |
| WATER HEATING DEPENDING ON THE CURRENTLY AVAILABLE PHOTOVOLTAIC POWER | | | |
| 200 W | °C/h | 6 | 2 |
| 400 W | °C/h | 12 | 4,5 |
| 550 W | °C/h | 16 | 6 |
| WATER HEATING VIA 230 V POWER GRID | | | |
| 1500 W | °C/h | 43 | 16 |



PHOTOVOLTAIC WATER HEATER 200 LITER AND 300 LITER

The photovoltaic floor-standing boilers supply hot water cost-effectively and CO₂-free. The photovoltaic modules are connected directly to the boiler. An additional heat exchanger enables connection to an existing gas, oil or pellet heating system.

1800 W of photovoltaic heating power provides enough hot water for a family of several people.



NO GAS & OIL

Shutting down inefficient and expensive gas & oil heating over long periods of the year.



COST SAVING

Hot water through almost free photovoltaic electricity. High economic efficiency due to low initial investment costs and almost no operating costs.



NO REGISTRATION

No electricity is fed into the grid. This eliminates the obligation to register the photovoltaic system.



EASY INSTALLATION

The photovoltaic modules are connected directly to the water tank. Due to the extra low voltage, no electrician is required for installation.



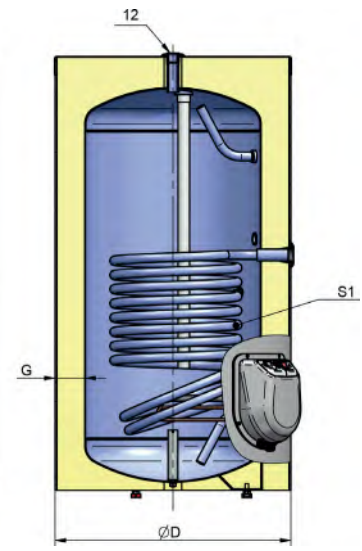
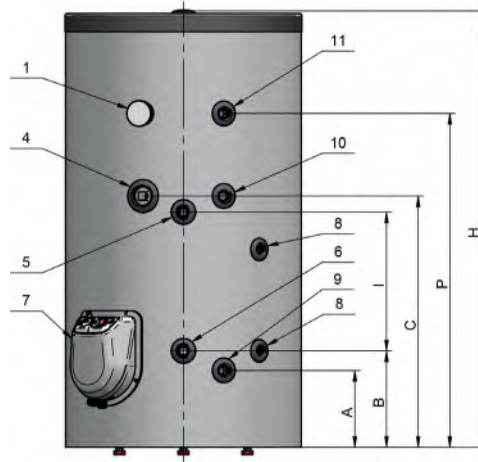
3X MPP TRACKER

Multiple MPP trackers for multiple strings provide maximum flexibility and yield.

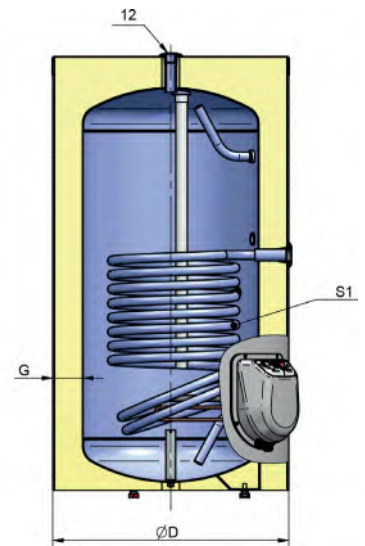
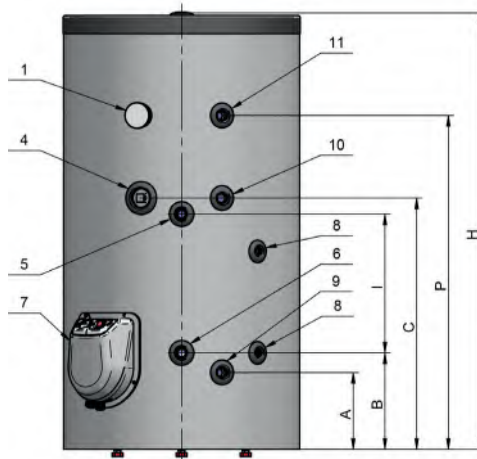


HEAT EXCHANGER

It is possible to connect an existing heating system in order to be able to reheat the water on days with low solar radiation.



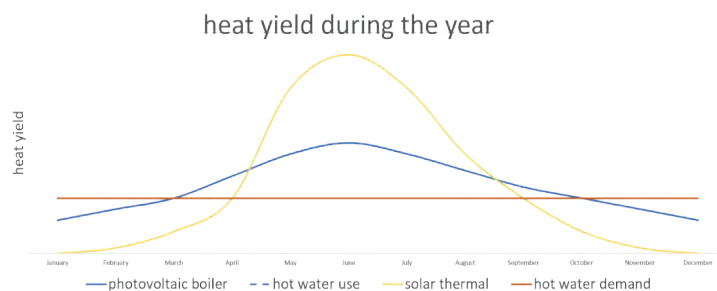
| | UNIT | 200 LITER | 300 LITER |
|--|-----------------|-----------|-----------|
| PHOTOVOLTAIC WATER HEATER | | | |
| Product model | – | PVB-200 | PVB-300 |
| Volume | l | 200 | 300 |
| Max. heat loss | W | 47,5 | 50,2 |
| Rated pressure | MPa | 0,8 | 0,8 |
| Volume | l | 186 | 264 |
| Gross weight | kg | 74 | 88 |
| PHOTOVOLTAIC HEATING (ELECTRICAL HEATING) | | | |
| Max. photovoltaic current consumption | A | 16 | 16 |
| Rated electrical power | W | 1800 | 1800 |
| Max. connected photovoltaic power | W _p | 6000 | 6000 |
| Max. connected photovoltaic power per MPP tracker | W _p | 2000 | 2000 |
| Max. open circuit voltage of photovoltaic module | V _{oc} | 50 | 50 |
| MPP tracker quantity | – | 3 | 3 |
| Time of heating with photovoltaic power at a sunny day (1800 W heating power) from 10°C up to 65°C | h | 6½ | 9½ |
| Maximum water temperature through photovoltaics | °C | 65°C | 65°C |
| CONNECTIONS | | | |
| 1: Thermometer | | ✓ | ✓ |
| 4: Additional socket | | G 1½ F | G 1½ F |
| 5: S1 – Feed | | G ¾ F | G ¾ F |
| 6: S1 – Return | | G ¾ F | G ¾ F |
| 7: Flange with heating element | | ✓ | ✓ |
| 8: Socket for thermostat | | G ½ F | G ½ F |
| 9: Fresh water inlet – Drain | | G ¾ F | G ¾ F |
| 10: Recirculation | | G ¾ F | G ¾ F |
| 11: Hot water outlet | | G ¾ F | G ¾ F |
| 12: Hot water outlet | | G ¾ F | G ¾ F |



| | UNIT | 200 LITER | 300 LITER |
|---|----------------|-----------|-----------|
| HEAT EXCHANER | | | |
| Operating pressure | MPa | 1 | 1 |
| Max. temperature on the heating fluid | °C | 110 | 110 |
| Max. temperature in the tank heated by the heat exchanger | °C | 95 | 95 |
| Surface area | m ² | 0,90 | 1,12 |
| Volume | L | 4,3 | 5,4 |
| NL [2] | ... | 3,6 | 8 |
| Continuous output according DIN 4708 | kW | 25 | 35 |
| Flow rate according DIN 4708 | L/min | 10 | 14 |
| Power according EN 12897 | kW | 18,6 | 19,3 |
| Heat up time according EN 12897 | Min | 28,8 | 39,4 |
| Pressure loss | mbar | 120 | 50 |
| Maximum amount of drained water MIX 40°C according EN 12897 when the power is off | L | 286 | 406 |
| DIMENSION | | | |
| A | mm | 210 | 210 |
| B | mm | 260 | 265 |
| C | mm | 855 | 840 |
| D | mm | 600 | 670 |
| G | mm | 75 | 85 |
| H | mm | 1430 | 1605 |
| I | mm | 550 | 530 |
| M | mm | 690 | 760 |
| P | mm | 1155 | 1315 |

PHOTOVOLTAIC VS. SOLAR THERMAL

Photovoltaic and solar thermal systems produce hot water from the power of the sun. The advantage of photovoltaic technology is that it produces electricity (or heat) regardless of the outdoor temperature. This means that hot water can also be produced in winter. Over the course of the year, a higher degree of selfsufficiency is achieved than with a solar thermal system.





**It's time to stop
burning up our pla-
net,**

**it's time to have more
independence from
fossil fuels and**

**it's time to let the sun
into our homes.**



CARAVAN WATER HEATER 10 LITER

Hot water by the power of the sun in the most beautiful places in the world

Photovoltaic modules plugged directly into the water heater provide the energy. Alternatively, the boiler can be connected to a 12 V or 24 V on-board battery. When the battery has reached a defined state of charge, the photovoltaic boiler switches on automatically.

Electrical surpluses can thus be stored in the water heater.

A second display conveniently shows the temperature of the boiler in the living area of the caravan.

The photovoltaic boiler produces hot water free of charge, climate neutral and independent.



INDEPENDENCE

Hot water supply independent of the 230V power grid. Photovoltaic energy can be used even without 230V connection.



POSSIBLE BATTERY OPERATION

Use of excess energy from a 12 V or 24 V battery to heat the water.



ANTI-FREEZE

Easy draining of water in winter to avoid frost damage.



EASY INSTALLATION

The photovoltaic modules are connected directly to the water heater. Due to the low voltage, no electrician is required for the installation.



QUALITY

Highest quality and safety standards thanks to a safety temperature limit, a magnesium anode, enameled protection and a check valve.



INNOVATIVE MPP TRACKER

Integrated MPP tracker for maximum photovoltaic yield.

| | UNIT | 10 LITER CARAVAN |
|--|-----------------|-------------------------------------|
| PHOTOVOLTAIC WATER HEATER | | |
| Product model | – | CPVB-10 |
| Volume | l | 9,5 |
| Rated pressure | MPa | 0,7 |
| IP classe | – | X1 |
| Gross weight (± 3%) | kg | 8 |
| Dimensions (length, width, height) | cm | 44x33x30 |
| Check and pressure relief valve | – | ✓ |
| Cathode protection | – | ✓ |
| Emailed protection | – | ✓ |
| Insulation | – | ✓ |
| Water connection | – | G ½ (M) |
| Integrated reverse polarity protection | – | ✓ |
| Digital display | – | ✓ |
| CE - certified | – | ✓ |
| PHOTOVOLTAIC INPUT | | |
| Max. photovoltaic heating power | W | 550 |
| Max. photovoltaic current consumption | A | 15,5 |
| Max. water temperature adjustment range | °C | 5 - 65 |
| Integrated MPP tracker | – | ✓ |
| Recommended photovoltaic power | W _p | 100 – 300 |
| Max. connected photovoltaic power | W _p | 2000 |
| Max. open circuit voltage | V _{oc} | 42,4 |
| Photovoltaic connector | – | MC4 |
| REHEATING VIA 230 V POWER GRID | | |
| Type of reheating | | Power supply unit (12V, 18V or 24V) |
| Heating power | W | 60 (12V), 160 (18V) or 240 (24V) |
| Max. water temperature adjustment range | °C | 5 - 65 |
| HEATING VIA RECHARGEABLE BATTERY | | |
| Recommended technology | | LFP, lead acid |
| Voltage level | V | 12 or 24 |
| WATER HEATING DEPENDING ON THE CURRENTLY AVAILABLE PHOTOVOLTAIC POWER | | |
| 200W | °C/h | 18 |
| 400W | °C/h | 36 |
| 550 W | °C/h | 50 |





PHOTOVOLTAIC HEATING ROD

The photovoltaic heating rod enables simple photovoltaic retrofitting of existing hot water buffer tanks. The heating rod is screwed into a standard 1,5" thread. The photovoltaic support provides energy and cost savings for conventional hot water preparation via gas or oil heaters.

Since the heating rod does not feed into the electricity grid, the photovoltaic system does not need to be registered.



RETROFIT

The Photovoltaic heating rod can simply be screwed into a standard 1.5" flange of an existing hot water tank.



INNOVATIVE MPP TRACKER

50% higher yield thanks to innovative MPP Tracker that always ensures the maximum yield of the PV modules.



HOT WATER SUPPLY

Hot water production through the power of the sun. Switch off your inefficient gas or oil heating in summer.



EASY INSTALLATION

The photovoltaic modules are connected by simple plug and play connections. No electrician is needed for installation.



GOOD FEELING

Enjoy the good feeling of a free and 100% environmentally friendly hot shower.



NO REGISTRATION

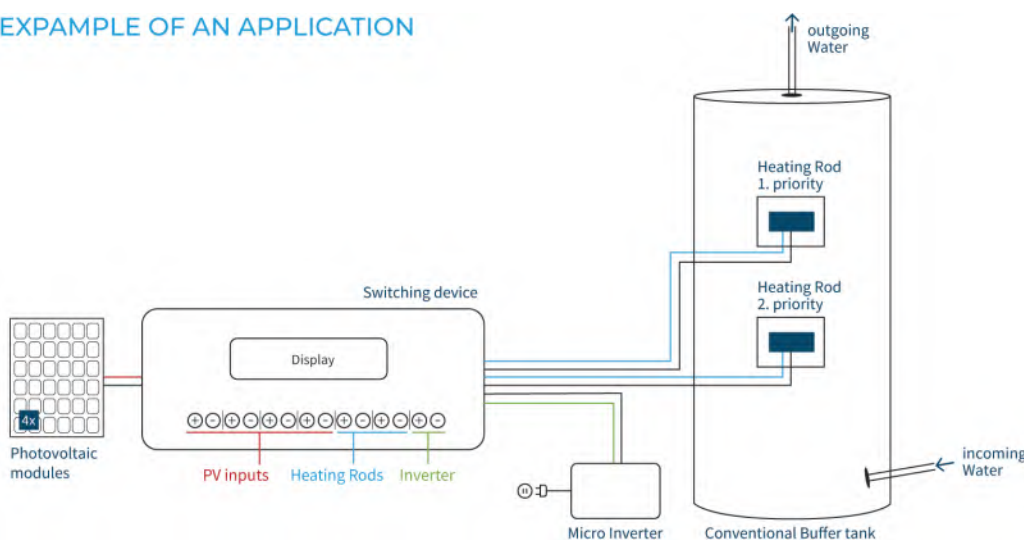
The heater works independently from the 230V power grid. No registration of the photovoltaic system is required.

| | UNIT | |
|---|-----------------|----------------|
| PHOTOVOLTAIC HEATING ROD | | |
| Product name | – | HROD-550 |
| Max. photovoltaic heating power | W | 550 |
| Max. photovoltaic current consumption | A | 15,5 |
| IP class | – | 24 |
| Gross weight (+/- 3 %) | kg | 0,8 |
| Max. water temperature | °C | 85 |
| Integrated MPP tracker | – | ✓ |
| Integrated reverse polarity protection | – | ✓ |
| Digital display | – | ✓ |
| CE – certification | – | ✓ |
| Dimensions housing (length, width, height) | cm | 15,4 x 10 x 10 |
| Dimensions heating rod, total (length, width, height) | cm | 15,4 x 10 x 47 |
| Screw in diameter | – | G 1½ (M) |
| PHOTOVOLTAIC INPUT | | |
| Recommended photovoltaic power | W _p | 300 - 1200 |
| Max. connected photovoltaic power | W _p | 2000 |
| Max. open circuit voltage at 25°C | V _{oc} | 50 |
| Photovoltaic connector | – | MC4 |

PHOTOVOLTAIC RETROFITTING OF AN EXISTING BUFFER TANK IN COMBINATION WITH THE FOTHERMO SWITCHING DEVICE.

The photovoltaic heating rods can be combined with the fothermo switching device. The water in the buffer tank is then heated in a prioritised manner from top to bottom. Surplus energy can be fed into the domestic grid via a micro PV inverter.

EXAMPLE OF AN APPLICATION





SWITCHING DEVICE

Use surplus energy to reduce costs for electricity.

When the photovoltaic boiler is fully heated, the excess electricity is fed into the grid. The feed-in takes place via a plug & play micro PV inverter. With this simple device, every household can save several hundred euros in additional electricity costs per year. No electrician is needed for the installation.



MICRO PV INVERTER

Retrofitting of an existing balcony power plant with a photovoltaic boiler is possible. Use your already existing inverter.



COST SAVING

Reduce your electricity bill and feed surplus electricity into your 230V power grid at home.



INTELLIGENT POWER DISTRIBUTION

Smart power distribution depending on the available power for maximum energy usage.



EASY INSTALLATION

Due to the extra low voltage, no electrician is needed for installation.



INDEPENDENCE

Make yourself less dependent on rising energy prices.

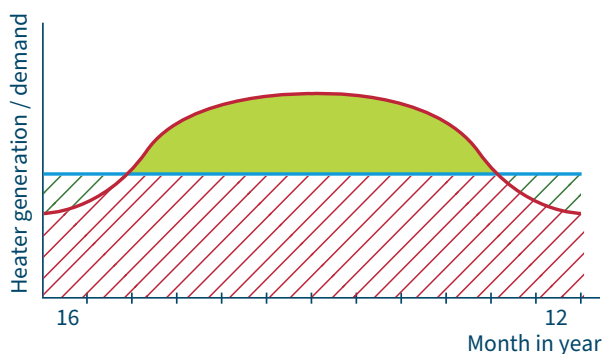
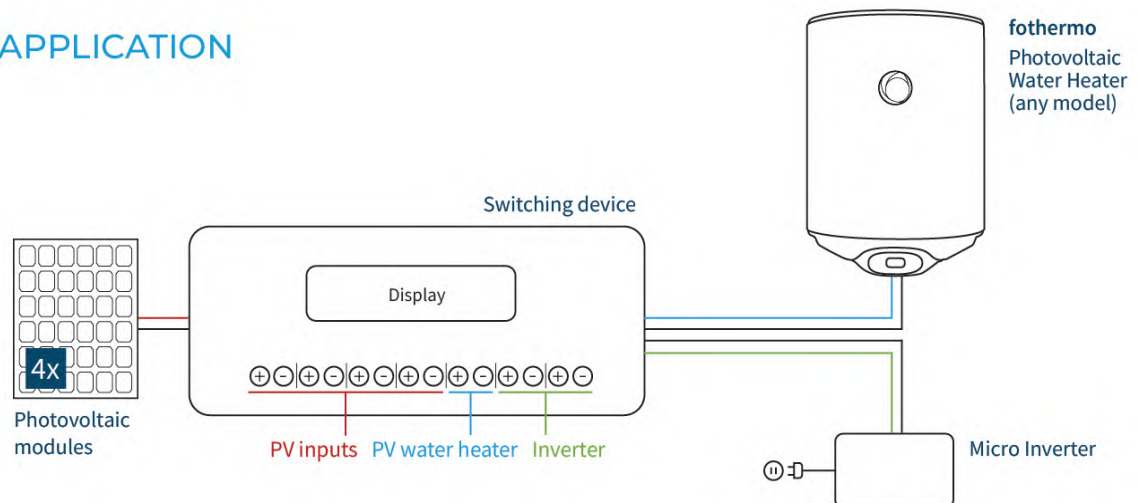


UP TO 4 PV PANELS

Use the power of up to 4 PV modules simultaneously. This allows even more electricity to be generated and used.

| | UNIT | |
|--|----------|------------------|
| SWITCHING DEVICE | | |
| Product model | - | SWD |
| PHOTOVOLTAIC INPUT | | |
| Number of connectable modules | - | 4 |
| Recommended photovoltaic power per input | W_p | 300 - 450 |
| Max. open circuit voltage | V_{oc} | 50 |
| Max. short circuit current per PV module | A | 12 |
| CONNECTABLE ELECTRICAL LOADS | | |
| Photovoltaic Water Heater | W | 600 |
| Micro PV Inverter | W | 2x 300 |
| GENERAL DATA | | |
| IP class | - | 20 |
| Gross weight (+/- 3 %) | kg | 0,4 |
| Integrated reverse polarity protection | - | ✓ |
| Digital display | - | ✓ |
| CE - certification | - | ✓ |
| Dimensions (length, width, height) | cm | 17,9 x 7,6 x 4,1 |

APPLICATION



SURPLUS FEED-IN

The surplus solar energy that exists in the summer months is made usable again by the switching device by feeding it into the grid.

- Energy demand for hot water
- Max. yield of the photovoltaic modules
- /// Photovoltaic energy used by the boiler
- /// Energy that must be drawn from the electricity grid to provide hot water due to low irradiation power.
- Surplus energy that is fed into the electricity grid with the switching device.

fothermo

use the power of the sun



BECOME OUR PARTNER

Get ahead of the competition, be innovative and offer your customers the option of free and renewable hot water.

You can reach us anytime at: sales@fothermo.com



fothermo System AG

Im Starkfeld 45b, 89231 Neu-Ulm, Germany

 +49 (0) 7346 9649960  sales@fothermo.com

 www.fothermo.com

 Follow us on LinkedIn.