

Battery Mode

Beta Version

Overview

System Mode	Solar Input	External Power Supply
Mode 1: PV Home	✓	External Power Supply Unit
Mode 2: 12V Battery	✓	12V Battery
Mode 3: 12V Battery + Reheat	✓	12V Battery
Mode 4: Excess Energy	✓	12V Battery 24V Battery
Mode 5: 24V Battery + Reheat	✓	24V Battery
Mode 6: 24V Battery + Reheat	✓	24V Battery

Mode 1 : PV-Home

This is the pre-defined standard setting. Photovoltaic modules are connected directly to the photovoltaic water heater. Optionally, the external 12V or 18V power supply offered by fothermo can be used for reheating purposes.

Features:

The photovoltaic water heater will be heated primarily by the photovoltaic power. If the water temperature drops below a pre-defined minimum temperature the external power supply unit will reheat the water to the defined minimum temperature.

System Requirements:

12V or 18V external power supply unit. (Item code: PSU-12, PSU-18)

Use Case:

Home applications with 220V - 240V AC power grid

Mode 2: 12V Battery

A 12V battery is connected directly to the photovoltaic water heater. As soon as the battery is fully charged the water heater will automatically use the excess energy. This has the advantage that the battery is always fully charged and only the excess power is converted into heat.

At the same time, photovoltaic modules can also be connected directly to the boiler.

Technical Information:

The photovoltaic water heater measures the external voltage of the battery. As soon as the voltage of the battery is higher than 13.5 V, the water heater uses the excess energy. The end-of-charge voltage of 13.5V is kept constant.

Recommended battery systems:

12V batteries: LiFePO4, Lead Acid, Gel, AGM, Sealed

Mode 3: 12V Battery + Reheating

Mode 3 is very similar to Mode 2. As soon as the water temperature drops below the preset minimum temperature, the battery will be discharged. This makes it possible to heat the water

even after sunset, when the water heater is no longer charged by photovoltaic power. The use of the excess energy is the same as in mode 2.

Technical Information:

When the water of the boiler is heated by the battery, the battery is discharged to a minimum voltage of 12.4V. At this voltage, the battery is not yet completely discharged and can therefore still be used for other electrical consumers such as lighting, charging cell phones, refrigerator, etc.

Recommended battery systems:

12V batteries: LiFePO4

Mode 4: Excess Energy

This mode is used when an external power supply, such as a battery system, manages the excess energy itself. This is the case, for example, when an output of the battery is activated from a certain state of charge.

Technical Information:

The photovoltaic water heater converts electrical energy into heat as soon as energy is provided by an external device.

This mode is designed for 12V and 24V battery systems. The maximum voltage is 30 volts.

Recommended battery systems:

12V or 24V battery system with a regulated output.

Mode 5: 24V Battery

A 24V battery is connected directly to the photovoltaic water heater. As soon as the battery is fully charged the water heater will automatically use the excess energy. This has the advantage that the battery is always fully charged and only the excess power is converted into heat.

At the same time, photovoltaic modules can also be connected directly to the boiler.

Technical Information:

The photovoltaic water heater measures the external voltage of the battery. As soon as the voltage of the battery is higher than 27 V, the water heater starts the heating process. The end-of-charge voltage of 27V is kept constant.

Recommended battery systems:

24V batteries: LiFePO4, Lead Acid, Gel, AGM, Sealed

Mode 6: 24V Battery + Reheating

Mode 6 is very similar to Mode 5. A 24V battery is connected directly to the photovoltaic boiler and all the excess energy is used. As soon as the water temperature drops below the preset minimum temperature, the battery will be discharged. This makes it possible to heat the water even after sunset, when the water heater is no longer charged by photovoltaic power.

Technical Information:

If the water is reheated, the battery is discharged to a voltage of 24.8V. At this voltage, the battery is not yet completely discharged and can therefore still be used for other electrical consumers such as lighting, charging cell phones, refrigerator, etc.

Recommended battery systems:

24V batteries: LiFePO4