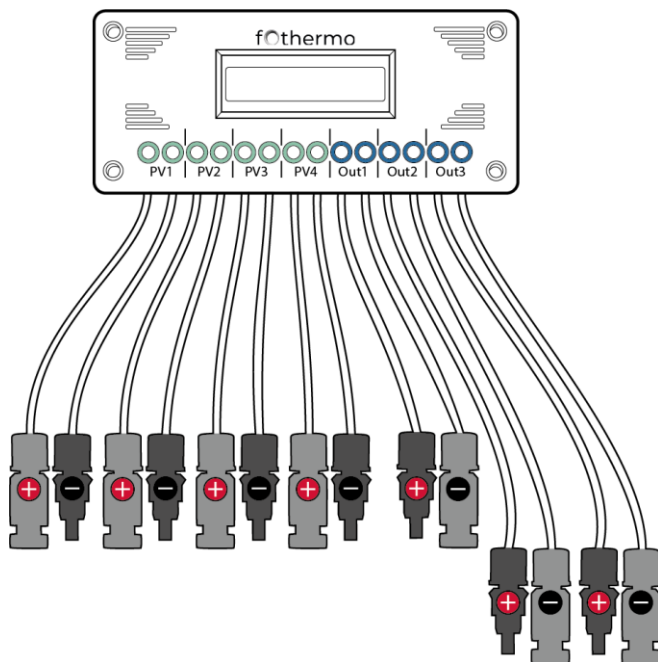


fothermo



SWITCHING DEVICE

ENERGY MANAGEMENT SYSTEM

TECHNICAL DESCRIPTION
ASSEMBLY, OPERATION AND
MAINTENANCE INSTRUCTIONS
WARRANTY TERMS AND
CONDITIONS

Anleitung per QR-Code.
Manual via QR code.
Manuel via QR code.
Manuale tramite QR.
Manual a través de QR.
Handleiding via QR-code.



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IMPORTANT!

Please read these operating instructions before installation and commissioning!

Note on the operating instructions:

The original version of this instruction manual is written in German. In case of questions, ambiguities or difficulties in understanding, it is recommended to consult the original German version of the operating instructions. Alternatively, you can contact the manufacturer directly for further assistance.

EN - Specifications	Unit	
Switching device		
Product Model	-	SWD-800
IP protection class	-	20
Integrated undervoltage protection	V	12
Integrated over-temperature protection	°C	100
Digital display	-	Yes
Dimensions housing (length, width, height)	cm	17.9 x 7.6 x 4.1
Weight	kg	0,8
Integrated reverse polarity protection	-	No
Integrated short-circuit current protection	-	No

Photovoltaic connection

Number of connectable photovoltaic modules	-	1 - 4
Recommended photovoltaic power per photovoltaic module	Wp	300 - 500
Max. open-circuit voltage of a photovoltaic module	Voc	50
Max. short-circuit current of a photovoltaic module	Isc	15

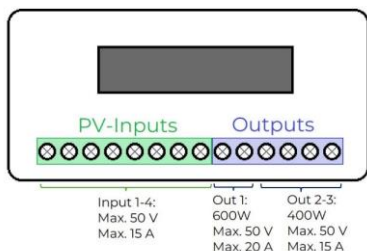
Important: The connected photovoltaic modules must match the electrical properties (max. current, max. voltage) of the connected loads. The switching device switches individual (whole) photovoltaic modules. There is no regulation of power or voltage in the switching device. If the connected load is not compatible with the photovoltaic panels, the electrical consumers can be destroyed.

Connectable electrical loads

Number of outputs for fothermo photovoltaic boiler	-	1
Rated power – Output 1 –	W	600
Max. Voltage – Output 1 –	V	50
Max. Current – Output 1 –	A	20
Number of Outputs for Micro PV Inverters	-	2
Maximum power of the connected Micro PV inverter	W	800
Rated power – Output 2 – and – Output 3 –	W	400
Max. voltage – output 2 – and – output 3 –	V	50
Max. Current – Output 2 – and – Output 3 –	A	15

GENERAL WARNINGS

Read the instructions and warnings in this manual carefully before installing and commissioning the switching device. The information provided here is intended to familiarize you with the installation and operation of the device. In addition, you are obliged to make this manual available to the competent persons who will install and possibly repair the device. These instructions should always be kept near the device for future reference. Compliance with the rules described here is one of the measures for the safe use of the product and is considered part of the warranty-conditions.



SAFETY

WARNING! This device can be used by Children from 8 years of age and over, and by persons with reduced physical, sensory or mental abilities or lack of experience and knowledge, if they have been supervised or instructed in the safe use of the device and understand the resulting dangers. Children are not allowed to play with the device. Cleaning and Maintenance must not be carried out by Children without supervision.

OTHER THINGS TO NOTE

- Observe the permissible electrical properties of the photovoltaic modules and the electrical loads to be connected.
- The connected electrical loads must be compatible with the connected photovoltaic panels.
- The device must be installed in a dry place.
- Accordingly, only a single module may be connected per input, with the maximum values specified in the specifications.
- Connect all photovoltaic modules and electrical consumers with the correct polarity. A reverse polarity can lead to a defect in the switching device.

- The fastening substrate must be fireproof. The USG must not be concealed and an adequate air supply must be ensured.
- The connection of refrigerators or accumulators is not provided. If an accumulator is nevertheless connected, an upstream charge controller must be used. However, in both cases, the warranty is void due to improper use.
- The use of a PV fuse plug is recommended.
- Use pre-assembled extension cables for the extension of the cables between the photovoltaic module and the switching device as well as the load (e.g. solar boiler, solar heating element). (Safety against reverse polarity)

SPECIFICATIONS

The switching device distributes the power of several photovoltaic modules to different electrical consumers. The product primarily serves as an energy management system. The energy generated by the photovoltaic panels can be distributed to the connected loads efficiently and with different priorities through the switching device.

Up to four photovoltaic modules can be connected to the switching device. The photovoltaic inputs - PV1 to PV4 - are used for this purpose. The energy generated by the photovoltaic modules is distributed to up to three electrical consumers. These are connected to the load outputs - output 1 to output 3. (See graphic)

Prioritization:

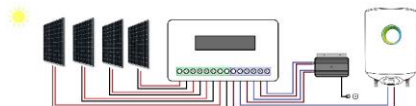
The switching device prioritizes the connected loads differently. The output - output 1 - has first priority. This is followed by - Output 2 - and then - Output 3 - . Loads connected to - output 1 - are supplied with energy on a prioritized basis. If 1 to 3 photovoltaic modules are connected, the modules are switched over after the load at the first output - output 1 - no longer absorbs power. If 4 photovoltaic modules are connected and they generate more power than the consumer connected under - Output 1 - can use, individual / entire photovoltaic modules are switched to the second load output - Output 2. If excess energy is also available, the output 3 output is also supplied with energy. If a consumer does not (or no longer) consume any power (e.g. fothermo solar boiler has reached the maximum temperature), the existing power (photovoltaic modules) is switched to the other connected consumers with lower priority if possible. If more

power is available from the photovoltaic modules than the maximum power specified by the outputs (600W or 400W) allows, individual photovoltaic modules are temporarily switched off.

APPLICATION

IMPORTANT: Make sure that the connected loads are compatible with the permissible system specifications of the photovoltaic modules.

fothermo Solar Boiler + Micro PV Inverter*



The switching device enables the use of surplus energy, which can no longer be stored as heat in the fothermo solar boiler.

* For the connection of an inverter, the use of "Mirco PV inverters" or "balcony power plant inverters" is provided, which are limited to a power of 400W per photovoltaic module input. It should be noted that the inverter has a separate input for each photovoltaic module. If several photovoltaic modules can be connected to one input of the inverter, it is not possible to use them in combination with the switching device.

PREPARATION

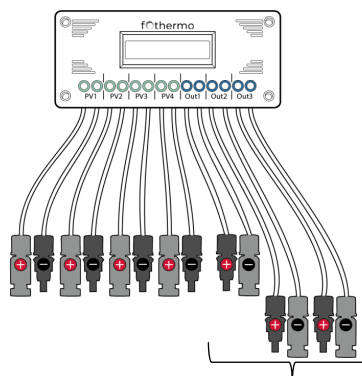
Make sure you have the necessary tools and assembly materials handy. We recommend four dowels and four screws with at least M4x70, depending on the mounting surface.

INSTALLATION

1. Assembly: Mount the switching device in a dry room. During installation, sufficient distance to neighboring fireproof walls and objects must be observed.

2. Connection cables: The connection cables are already factory-assembled. Dismantling and removal of the cables is prohibited for safety reasons. Check that the connection cables are connected correctly before connecting the photovoltaic modules or consumers.

To do this, compare the following drawing with the cables already connected to the switching device.



Note: different polarity of the connection cables

3. Connection of the photovoltaic modules:

IMPORTANT! It is operated with direct current.

IMPORTANT! Only photovoltaic modules of the same type may be connected individually to the inputs of the switching device.

IMPORTANT! A series or parallel connection of the photovoltaic modules at one input leads to a defect in the device.

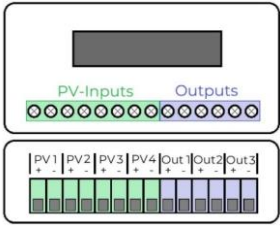
IMPORTANT! The connected photovoltaic modules must comply with the electrical limitations of the connected loads.

IMPORTANT! The installation of the photovoltaic modules may only be carried out by a competent person and must exclude any danger to third parties. Furthermore, the regulations and laws applicable locally must be observed.

IMPORTANT! A maximum of four photovoltaic modules with an open-circuit voltage of no more than 50 V and a short-circuit current of up to 15 A may be connected individually to the system's designated connections.

The photovoltaic modules and the loads are connected via the connection cables connected to the switching device. The photovoltaic module inputs are indicated by the green clamp contacts on the switching device. Make sure that the photovoltaic modules are connected with the correct polarity. (A common reason for incorrect polarity is the swapping of the cables during installation, which means that the polarity is not correctly maintained).

Start by connecting the first photovoltaic module to the first (left) red marked connection cable (PV1+) for the positive connection (+) and (PV1-) for the negative connection (-) of a photovoltaic module.



Assemble further modules from left to right in ascending order according to the principle described above. If only two modules are connected, please connect them to the connection cables of the PV1 and PV4 inputs to ensure proper functioning. Check whether the display of the switching device lights up after connecting the first photovoltaic module.

After connecting the first photovoltaic module, a timer of 5:00 minutes begins to count. You should connect all photovoltaic panels within this given time. This ensures that the switching device recognizes all photovoltaic modules and that flawless operation is guaranteed.

If you were unable to connect all the photovoltaic panels to the switching device within the 5:00 minutes, you should disconnect all the photovoltaic panels from the switching device and let the timer start again.

The device is completely disconnected from the power supply system when all supply plugs / photovoltaic modules are disconnected.

4. Connection of the electrical consumers:

The loads are connected to the connection cables, which are already pre-assembled on the blue terminals of the switching device.

Take the connection cables with the red mark for the connection of the positive voltage (+) and the connection cables with the black cables for the negative voltage (-).

At the first load output – output 1 – the fothermo solar boiler or solar heating element is connected. To do this, the cables are connected to the positive voltage (+) connector of the load at the terminal labeled "Out 1 +". The connection cable to "Out 1 –" is connected to the negative terminal (-) of the device.

The Mirco PV inverter is connected to the cables of the load outputs – Output 2 – and / or – Output 3. Plug the inverter directly into the pre-assembled connection cables of the switching device. Do not use an additional extension cord between the switching

device and the inverter. The respective connection cables of the "Out +" terminals are connected to the positive voltage connector of the inverter (+). The connection cables on the "Out –" terminals are connected to the negative terminals (-) of the micro PV inverter.

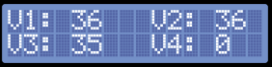
OPERATION

Operation:

When the device is commissioned, a 5:00 minute timer runs until the start, presented in the following figure.



After the timer has expired, the switching device determines the number of connected photovoltaic modules, and the detected module voltages are displayed according to the following figure.



After proper installation, the switching device "checks" the availability of each output according to their prioritization (see section, Prioritization), as shown in the figure below.



If, for example, the display – Check Output 1 – is shown on the display, the switching device waits for the power consumption of the load at output 1. If no power is absorbed by the connected consumer, the switching device switches the photovoltaic modules to the second output. Switching is fully automatic and can take up to 5 minutes per output.



Especially in very poor lighting conditions (e.g. sunrise and sunset or in winter), it can happen that the switching device does not leave the check-out mode for a long time. In this case, less power is available from the photovoltaic modules than the consumer needs to switch on/operate. The switching device is waiting for a higher photovoltaic output.

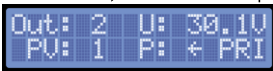
Once the switching device has detected an available output, it automatically connects the connected photovoltaic modules to available outputs depending

on the incoming photovoltaic power. No operation is possible on the part of the user. The display is used to read the current system status during operation. The display is structured as follows:



In this figure, the active output is shown at the top left, and the corresponding output voltage next to it on the right. The number of photovoltaic modules connected is displayed at the bottom left, and the output power is indicated at the bottom right.

If several outputs are active, they are displayed one after the other. If only one output is active, the display is not switched. If one output consumes little power, the modules connected there are switched to another output after a short time. This ensures that the prioritization (see section above, prioritization) of the outputs and ensures the best possible use of the photovoltaic modules. This scenario is indicated by the following image of the device, where an arrow indicates the direction in which the module(s) will be transmitted after the output has been switched off. In the example shown, the module connected to output 2 is switched to the left, i.e. to the first output.



If outputs with higher prioritization have been switched off during operation (e.g. due to reaching the maximum temperature of the boiler), their availability is cyclically checked, as shown in the figure below. For this purpose, a connected photovoltaic module is connected to the output and the power consumption is checked. If the tested output can absorb energy again, modules are switched on, but if this is not the case, the switching device returns to its previous operating state.



MAINTENANCE AND REPAIR

To clean the switching device, remove all electrical connections beforehand. The outer shell and the plastic parts of the device can only be cleaned with a slightly damp cotton cloth, without aggressive and/or abrasive agents. The device can only be put back into

operation after the moisture has been completely removed.

DISTURBANCES

If there is a malfunction while using the switching device, please follow the instructions in the error messages:

Short detected Remove devices: A short circuit is present. There is no more power flowing. Disconnect all connection cables from the switching device. Fix the short circuit and restart the switching device by reconnecting the photovoltaic panels.

Cooling down: The switching device has reached the maximum temperature. All loads were automatically disconnected from the photovoltaic panels. There is no more power flowing until the switching device has cooled down. Check that all product specifications are met. Make sure that the switching device is better cooled.

Undervoltage detected: There is too little voltage at the switching device. The switching device goes into safety mode and waits for higher photovoltaic module voltages.

If you have any questions, contact your seller or the manufacturer.

ENVIRONMENTAL PROTECTION

This equipment is labelled in accordance with the Waste Electrical and Electronic Equipment (WEEE) Directive. By ensuring that the appliance is returned to a suitable disposal centre at the end of its life, you are helping to protect the environment and avoid negative impacts on the environment and human health. The -symbol indicates that the device must not be disposed of in normal household waste at the end of its service life. It must be handed in at a disposal centre with special facilities for electrical or electronic equipment. The end user must comply with local disposal regulations when disposing of the goods. For more information on the treatment, recovery and recycling process, please contact your municipality, your local disposal centre or the specialist retailer from whom you purchased the product.

WARRANTY

The warranty for the device is only valid under the following conditions:

- The device is installed according to the assembly and use instructions.
- The appliance shall be used only for its intended purpose and in accordance with the instructions for assembly and use.

The warranty includes the correction of all manufacturing defects that may occur during the warranty period. Only the professionals authorised by the seller are allowed to carry out the repairs. The warranty does not cover damages:

- improper transport,
- improper storage,
- improper use,
- improper electrical voltage that deviates from the rated voltage,
- extraordinary risks, accidents or other force majeure,
- Failure to follow the assembly and use-instructions, and
- in all cases when an unauthorized person tries to repair the device.

In the aforementioned cases, the damage will be repaired against payment. The warranty of the device does not apply to parts and components of the device that are worn out during its normal use, nor to parts that are degraded during normal use, to lights and signal lamps, etc., to discoloration of external surfaces, to changes in the shape, dimensions and arrangement of parts and components that have been subjected to an effect that does not correspond to the normal conditions of use of the device. Missed benefits, material and non-material damage resulting from the temporary impossibility of using the equipment during the period of its repair and maintenance are not covered by the warranty of the device.

COMPLIANCE WITH THE REQUIREMENTS SPECIFIED IN THE MANUAL IS A PREREQUISITE FOR THE SAFE OPERATION OF THE PURCHASED PRODUCT AND IS ONE OF THE WARRANTY CONDITIONS. ANY MODIFICATIONS OR MODIFICATIONS MADE TO THE STRUCTURE OF THE PRODUCT BY THE USER OR BY PERSONS AUTHORIZED BY HIM ARE STRICTLY PROHIBITED. IF SUCH ACTS OR ATTEMPTS ARE DETECTED, THEN THE WARRANTY-OBLIGATIONS OF THE MANUFACTURER OR THE DEALER ARE INVALID. THE MANUFACTURER RESERVES THE RIGHT TO MAKE STRUCTURAL CHANGES WITHOUT NOTICE, PROVIDED THAT THE SAFETY OF THE PRODUCT IS NOT COMPROMISED. IF NECESSARY, OR IF THERE IS ANY - MISUNDERSTANDING IN CONNECTION WITH THE TRANSLATION AND THE TERMS USED IN THIS LANGUAGE-

VERSION OF THE ASSEMBLY AND USE INSTRUCTIONS, PLEASE USE THE GERMAN VERSION AS THE ORIGINAL AND AS THE PRIMARY VERSION.