

Assembly Instructions



AC•THOR® i

Photovoltaic Power Manager

Australian & New Zealand Distributor

Energy Smart Water Pty Ltd ABN 65 161 756 690

A: 2/11 Dalkeith Drive, Dromana Vic 3936, Australia

W: esw.net.au | **P:** +61 3 9939 6722 | **E:** info@esw.net.au

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1. Operation manual

In addition to these assembly instructions, the current version of the **Operating instructions** for the device is available at www.my-pv.com.

Wiring diagrams at the end of the document.



The following device key is required for online registration of the unit. Keep it safe!

Enter device key here

2. Intended use

The electronic AC•THOR®i Photovoltaic-Power-Manager (in the following, AC•THOR®i for short) is designed for operating resistive loads such as electric immersion heater elements, electric boilers, electric convectors, electric heating mats or infrared panels. The unit controls the output voltage according to external signals (temperatures, Ethernet- and other control signals) linearly and thus the power output of the connected load.

The AC•THOR®i is controlled by the my-PV Power Meter or can be combined with products such as inverters of different manufacturers (the current list of manufacturers can be seen at <https://www.my-pv.com/en/info/compatible-manufacturers>).

The AC•THOR®i is designed for fixed installations indoors.

Installation in rooms with high levels of humidity must comply with the relevant.

The ACTHOR has an ambient temperature rating of 0°C -40°C. If installed outdoors it must be able to function within this temperature range and be located in a shaded position inside an IP55 rated waterproof cabinet which allows airflow around the unit. Forced ventilation may need to be considered. Contact tech support for further advice regarding installing the unit in an outdoor enclosure.

Any application other than those described above may cause damage.

Furthermore, this may lead to hazards such as a short circuit, fire, electric shock, etc. The safety instructions and the information on handling in this manual and in the Operating Instructions must be followed!

The product complies with the statutory, national, and European requirements. The names of the company and products are trademarks of my-PV GmbH. All rights reserved.

You will find a comprehensive description of the device's functions and settings using the display or via web interface in the Operating Instructions.

3. Scope of supply

- AC•THOR®i Electronic Photovoltaic Power Manager
- Wall bracket (on the rear of the unit)
- Assembly set (3 screws 4.2 x 32 mm, 3 wall-plugs 6 mm)
- my-PV digital temperature sensor (cable length 5 m) with 8-pin plug
- Power supply 3 poles for 16 A switch output 2.8m (attached to the unit)
- European plug contact for resistive load
- Operator stylus for the display with holder
- Assembly Instructions
- Key-fob AC•THOR



Optional Accessories Available (not included)

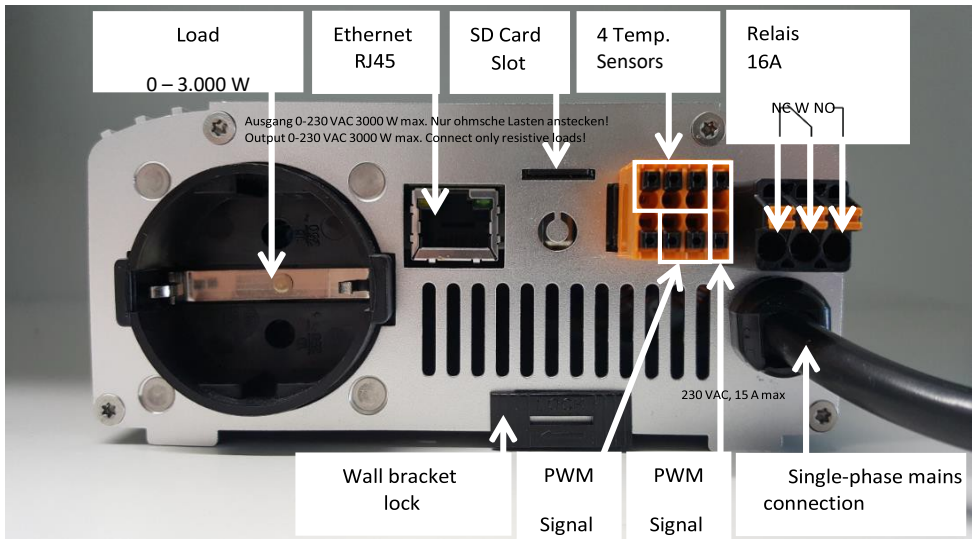
- my-PV Power Meter
- my-PV digital temperature sensor (cable length 5 m) with 8-pin plug

4. Safety instructions

- Installation must be carried out by a licensed electrician in accordance with AS/NZS 3000.
- For water heating applications compliance with AS/NZS 3500 is required.
- Do not open the AC•THOR®i. The device does not contain any parts that may be repaired by the user.
- Only pure resistive electric loads (0-3000W) such as immersion heater elements, boilers, convectors, heating mats or infrared panels can be connected to the AC•THOR®i.
- The loads connected must be suitable for variable supply voltages between 0-230 V AC (in no circumstances units with electronic power supply!).
- All connected devices must be operated with phase and neutral conductor.
- Never connect 400 V loads without neutral conductor! Otherwise this may cause damage to the AC•THOR®i or to the other loads connected to it.
- Only the supplied plugs must be used for connection to the AC•THOR®i.
- Operation of heating systems incorporating electronic thermostats is not possible.
- For heating water, only heaters with an integral safety temperature limiter may be connected.
- The AC•THOR®i is designed for fixed installations indoors.
- Comply with the relevant standards when mounting and connecting the device.
- The AC•THOR®i housing may heat up during operation. Only mount the unit on non-combustible surfaces.
- The AC•THOR®i is only intended for use in dry rooms indoors. Otherwise there is a risk of fatal electric shock!
- Installation in rooms with a high level of humidity must comply with relevant regulations.

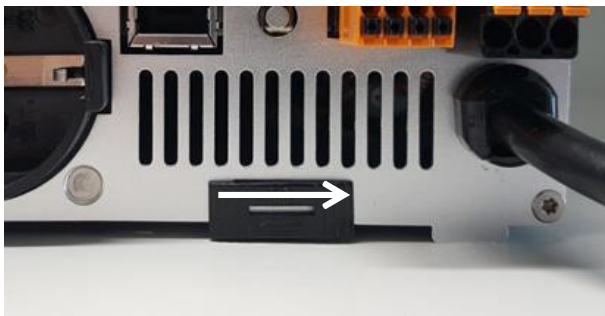
- Do not install the device in an environment contaminated with ammonia.
- Do not install the device in a dusty environment.
- The ventilation holes of the housing must not be covered.
- Avoid exposure to high temperatures ($> 40\text{ }^{\circ}\text{C}$), low temperatures ($< 0\text{ }^{\circ}\text{C}$) or direct sunlight during storage and operation.
- The AC•THOR®i must be connected to a nominal voltage of 230 V AC, 50/60 Hz. The neutral conductor is necessary!
- Protection of the mains connection for the AC•THOR®i may not exceed 16 A per phase (tripping characteristic B or C).

5. Connections overview



6. Mounting

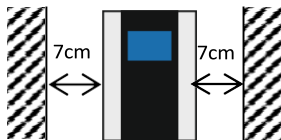
1. Remove the wall bracket from the rear of the AC•THOR®i unit. To do this, slide the lock underneath to the right.



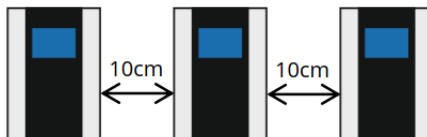
2. Then fix the wall bracket to the wall with three screws. Three screws and three wall-plugs are supplied. If the screws supplied are not suitable for the substrate, suitable screw must be obtained.



3. To fix it to the wall bracket, the AC•THOR®i is suspended in the wall bracket by the two long slots on top and then fixed in place by locking it underneath (slide to the left).
4. Check the AC•THOR®i is securely fixed!
5. When installing in an electrical cabinet, ensure sufficient cooling, for example through ventilation slots in the switch cabinet door.
6. A minimum lateral distance of 7cm must be observed.



7. When installing several devices side by side, a minimum distance of 10cm must be maintained



8. Then the electrical connections can be made.

Do not immerse my-PV temperature sensor(s) directly in Water. Use a thermowell!



For mains leads, use a cable duct of 60 mm depth. The cut-out measures 130 x 60 mm.



7. Electrical connection

The AC•THOR®i is controlled by external signal sources by way of IP protocol using a standard Ethernet RJ45 cable.

Protection of the mains connection for the AC•THOR®i may not exceed 16 A per phase (tripping characteristic B or C).



The PE conductor and the neutral conductor must be connected!

Pay attention to other loads on the line circuit, this may trip the circuit breaker!

The solar diverter (AC•THOR®i) circuit shall be protected by a 30 mA Type AC RCD installed in accordance with AS/NZS 3000.

An isolating switch in accordance with clause 4.8.2.3 AS/NZS 3000:2018 shall be installed for the water heater.

Where more than one circuit can supply the water heater, a warning sign shall be installed within the installation switchboard that the solar diverter circuit originates, and on the water heater.

NOTE: The installation of a solar diverter can introduce an unforeseen hazard, where if the grid supply to the water heater is isolated at the switchboard, the diverter may still be able to supply power to the water heater. The warning sign shall state the following:

WARNING solar diverter installed.
Isolate all supplies before working on water heater.



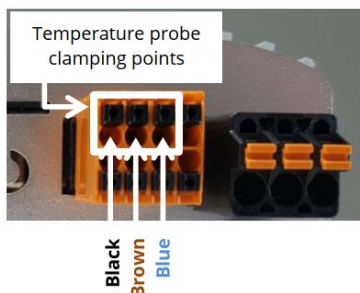
Refer to the wiring diagrams provided in section 14 for further detail.

7.1. Connecting temperature probes



Do not immerse my-PV temperature sensor(s) directly in water.
Use a thermowell!

Up to four digital temperature probes (three-core, bus system) can be connected to the AC•THOR®i. The terminal positions for the three cores are shown in the following illustration.



If more than one probe is used, the cores can also be connected externally in parallel.

7.2. Electrical connection for multiple units

All devices should be connected to appropriate AC circuits. Note that each AC•THOR®i takes up to 3 kW power (with relay output up to 6 kW). It makes sense to divide this between the phases on the grid.

8. Operation displays

The unit has a touch screen to show operating conditions and for ease of operation.

Never touch the screen with pointed objects or those having sharp edges!



Use the supplied stylus for programming. The holder for the stylus can be stuck on to a surface on or close to the unit with the adhesive patch. A detailed description of the graphic user interface, the operating modes, the

menu guide, and settings are located in the Operating Instructions for the unit. The current version is available at www.esw.net.au

9. Maintenance

Do not attempt to open the AC•THOR®i. The device does not contain any parts that may be repaired by the user. In the event of a fault, please contact Energy Smart Water on 1800 433 254 or email techsupport@esw.net.au.

Never splash water on or in the unit!

When switched off, the surface of the device can be cleaned either with a damp cloth, using mild glass cleaner or cleaning tissue for glasses.

In a polluted environment, the air inlets and outlets should be checked regularly for cleanliness. If necessary, the device can be cleaned through the air slots with a vacuum cleaner.

The AC•THOR®i cannot work at maximum efficiency if the air supply is inadequate!

10. Troubleshooting

The device does not contain any parts that may be repaired by the user. In the event of a fault, please contact Energy Smart Water T 1800 433 254 or email techsupport@esw.net.au.



11. Disposal

Packaging material must be either stored or disposed of as appropriate.

Dispose of the AC•THOR®i at the end of its service life according to the statutory regulations.

12. Warranty

12.1. Warranty – General

This warranty is given by Energy Smart Water Pty. Ltd., 2/11 Dalkeith Drive, Dromana Vic 3936, Australia, ABN 65 161 756 690 for installations in Australia and New Zealand only.

For details about this warranty contact Energy Smart Water on 1800 433 254 or email techsupport@esw.net.au.

This warranty covers any defects in materials for a period of **2 years from date of purchase** when the product is installed and operated according to the written installation instructions. Energy Smart Water will repair or replace the covered product or any part or component that is defective in materials or workmanship subject to the terms within this document.

A call out fee is chargeable where it is found there is no fault with the product.

If a subsequent version of this warranty is published, the terms of that warranty will apply after the date specified in the subsequent version.

12.2. Terms of Warranty

Supplied product must only be installed, commissioned, or serviced by a licensed electrician in accordance with all electrical standards, municipal

building codes, occupational health, safety & welfare regulations, and other State or Federal statutory regulations.

Where a failed product is replaced under this warranty, the balance of the original warranty period will remain effective. The replacement does not carry a new warranty.

This warranty extends to the original purchaser and subsequent owners, but only while the product remains at the site of the original installation. The warranty only extends through the first installation of the product and terminates if the product is moved or reinstalled.

Replacement of the product may be authorised by Energy Smart Water only. Energy Smart Water does not authorise any person or company to assume for it any obligation or liability in connection with the replacement of the product.

If the product is found to be free of defects in material or workmanship, or damaged by improper installation, or damaged during return shipping, the warranty claim for product, parts and labour may be denied.

Where the product is installed outside the boundaries of a metropolitan area, the cost of travelling to the installed site shall be the owner's responsibility.

12.3. Warranty Exclusions

- Where the product has not been installed and operated in accordance with the instructions in this manual.
- Where the product is misused, damaged, neglected, abused, operated outside of instructions in this manual.
- Where the defect is caused by improper installation of a third party product or defective third party product.
- Where damage is caused by an act of God, fire, lightning, flood, earthquake, landslide, storm, hail, frost, wind, or other severe adverse weather conditions.

- Where the product is located in a position that does not comply with the installation instructions or relevant statutory requirements.
- Where the product is moved or reinstalled at a new location.
- Where the connection, attachment, integration or general association of other equipment or parts not instructed by this manual which either directly or indirectly affect the performance or operation of this equipment.
- Altering, disassembling, attempt to repair or otherwise intervening in the device or making changes to the device without authorisation.
- Any damage or injury caused by improper handling or failure to observe the assembly and operating instructions.

12.4. How to make a warranty claim

To be entitled to make a claim under this warranty you need to be the owner of the product or have consent from the owner to act on their behalf and provide proof of purchase. Provide owner's details, address of the device, a contact number and date of installation.

As soon as reasonably practicable you must contact Energy Smart Water on 1800 433 254 or email techsupport@esw.net.au and advise of the fault or issue. Energy Smart Water will arrange for the product tested and assessed on-site.

If Energy Smart Water determines that you have a valid warranty claim, the unit will be repaired or replaced in accordance with this warranty.

12.5. Purchaser's Statutory Rights

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

The Energy Smart Water warranty is in addition to any rights and remedies that you may have under the Australian Consumer Law.

13. EU declaration of conformity

my-PV GmbH, Teichstraße 43, 4523 Neuzeug, Germany
hereby declares that the products of the product AC•THOR®i
comply with the following Directives and standards:

EN 55014-1, EN 55014-2, EN 60730-1, EN 62233, EN 61000-3-2,
EN 61000-3-3



The company named above holds available for inspection documentation as proof of fulfilment of the safety objectives and the principal safety requirements.

Neuzeug, 09.05.2018

Dr. Gerhard Rimpler, Managing Director

The logo for myPV, with 'my' in black and 'PV' in blue, in a bold, sans-serif font.

14. Technical specifications

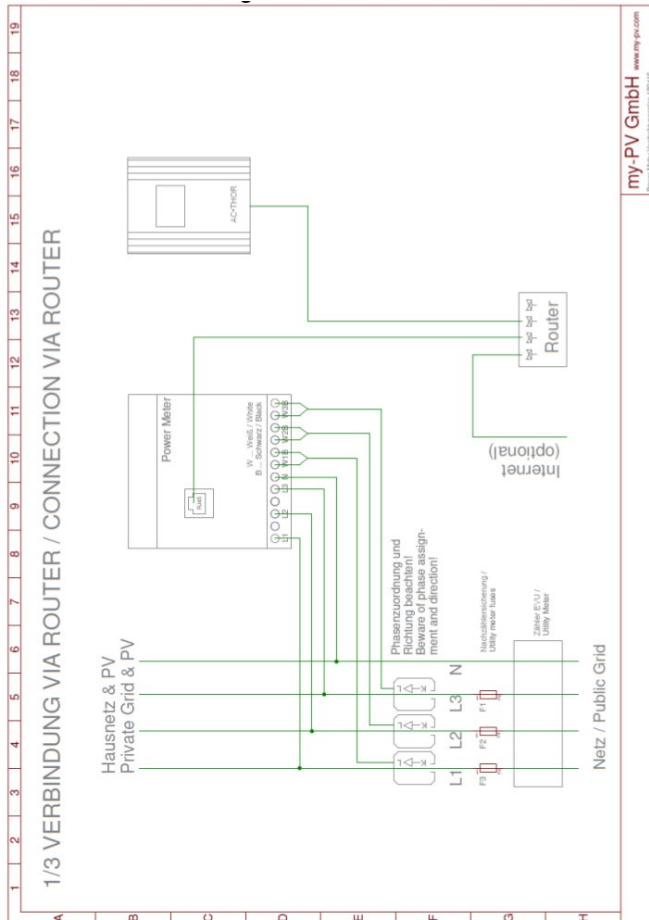
my-PV AC•THOR®i

Mains voltage	230 V, 45-65 Hz
Outputs	0 to 230 V pure sine 0 to 3,000 W max.
Relay output	1 x UM 20 V AC 100 mA min. 230 V AC 16 A max.
Mains connection	3-phase with neutral conductor
Safeguarding	16 A tripping characteristic B, C
Load connection	Plug contacts for resistive loads
Standby consumption	< 1.5 W
Efficiency	> 98 % at rated power
Operating temperature range	0°C to 40 °C
Permissible RH	0-99 % (non-condensing)
Storage temperature	-20°C to 70 °C
Protection	IP20
Protection class	I
Temperature sensor	my-PV digital temperature sensor (5 m)
Display	Colour graphic, touch screen 2.83"
Warranty	2 Years (extended warranty upon request)
Weight (without wall bracket)	1.5 kg including lead (without wall bracket)
Dimension (W x H x D)	135 x 195 x 65 mm without mains cable
Interfaces	Ethernet RJ45, RS485, potential-free input, PWM out, PWM in
Compatible systems	see www.my-pv.com

15. Wiring diagrams

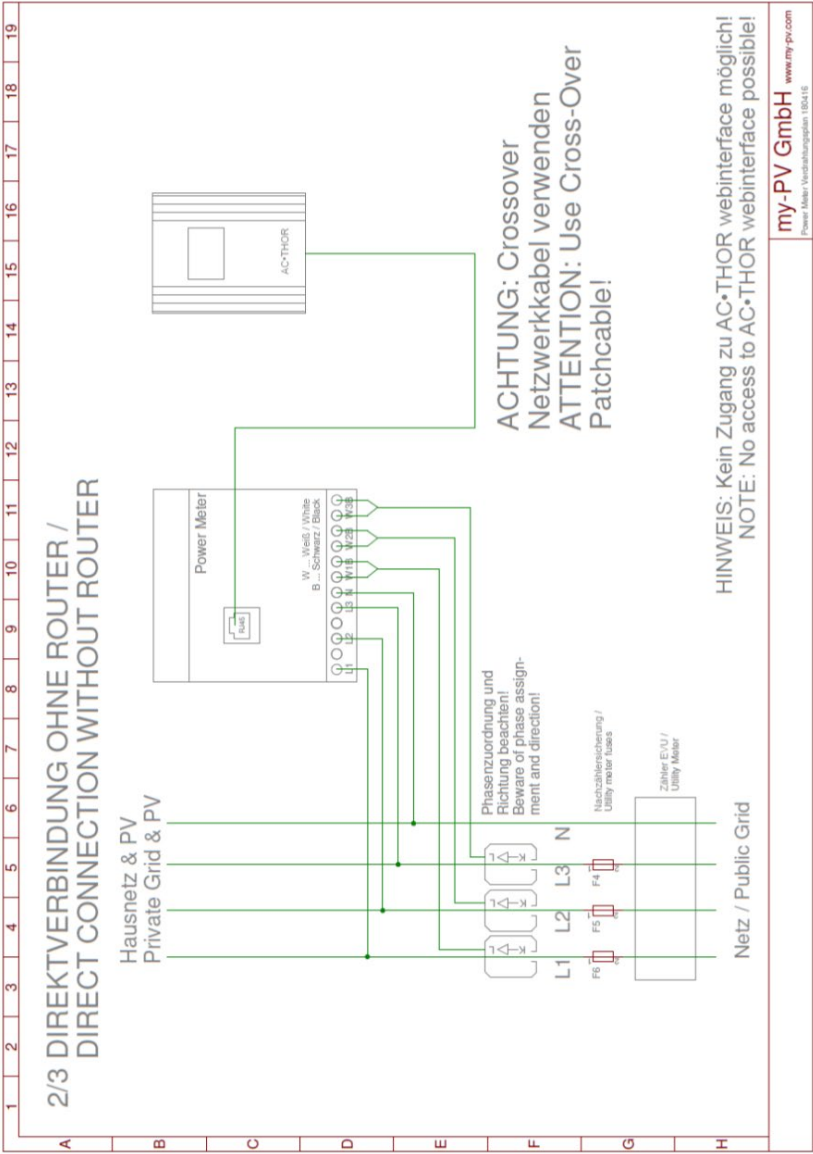
15.1. AC•THOR®i - Wiring the control side

Power Meter – connection via router

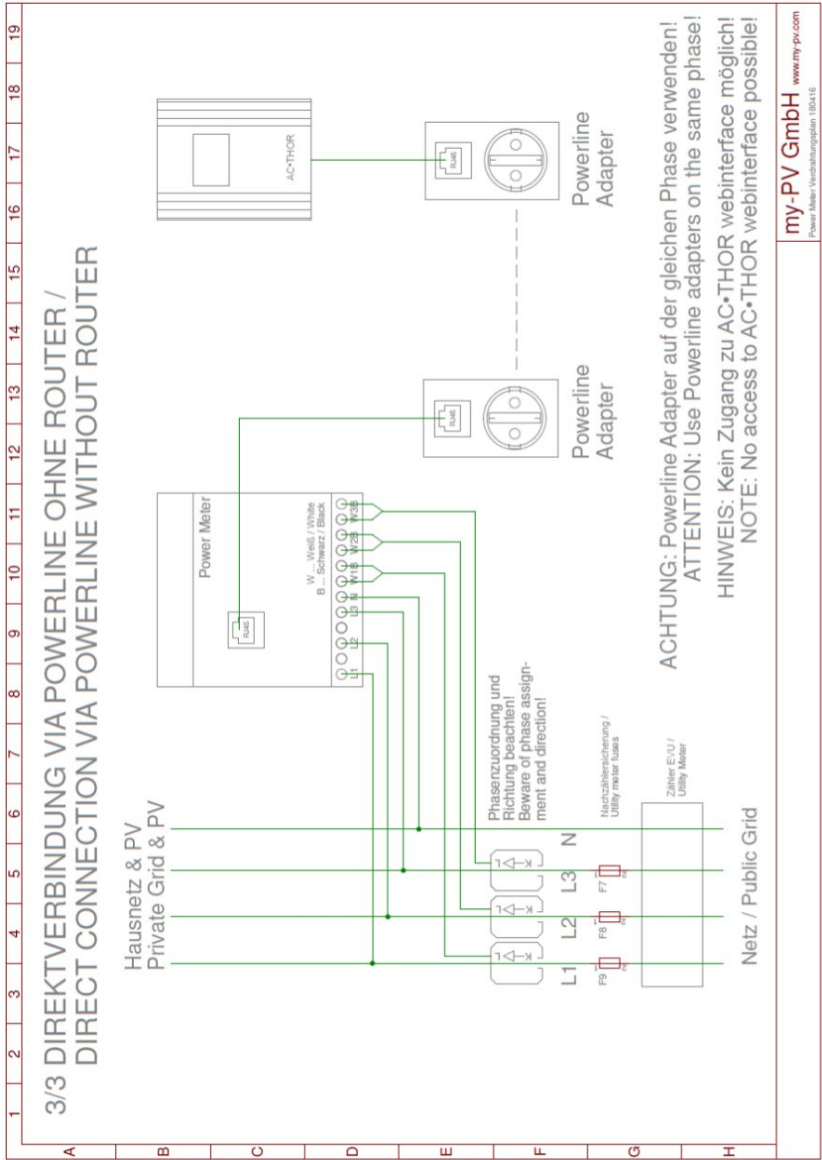


Establishing the automatic connection via router may take as much as a minute!

Power Meter – connection without router



Power Meter – connection without router via powerline



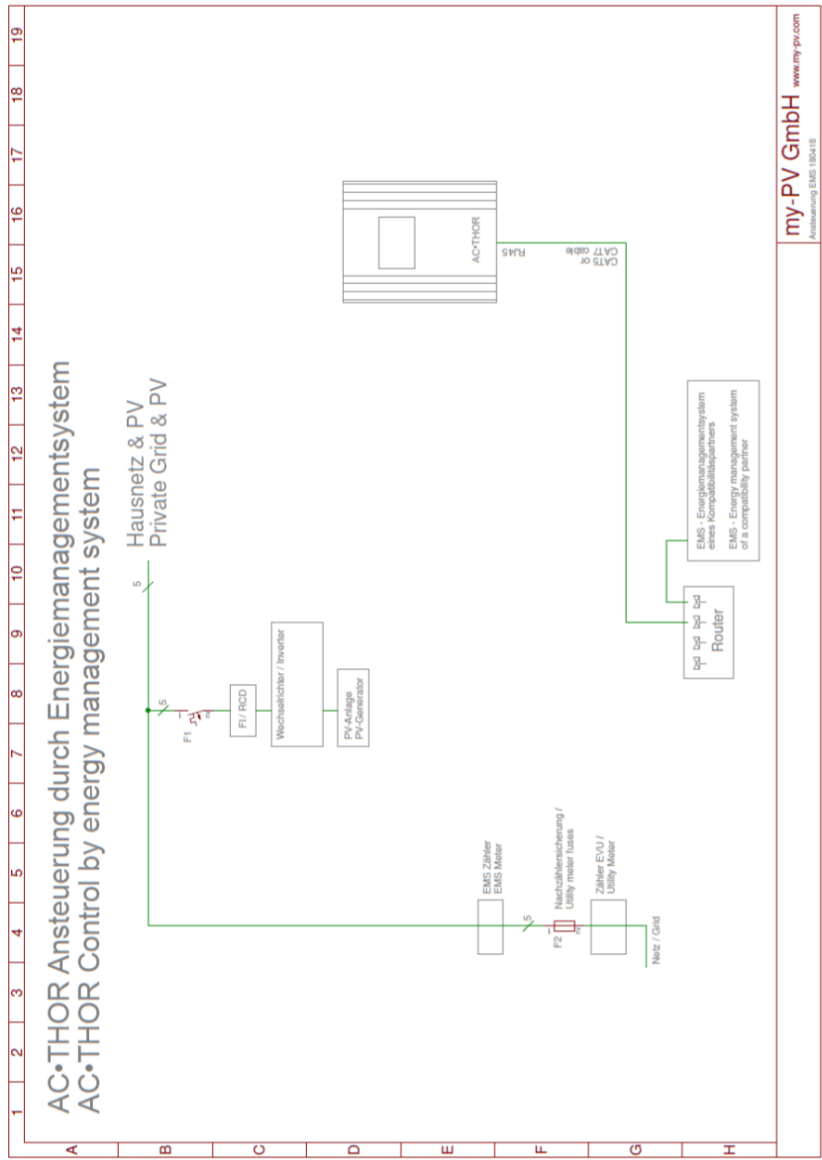
AC•THOR Ansteuerung durch Wechselrichter oder Batteriemangement
AC•THOR Control by inverter or battery storage

Diagram illustrating the AC•THOR control system architecture:

- Power Source:** The system is connected to the **Netz / Grid** (Utility Network).
- Measurement and Protection:** A **Zähler E/U / Utility Meter** and **Nachzählversicherung / Utility meter fuses** (F5) are installed on the incoming line. A **Zähler Wechselrichter oder Batteriespeicher / Inverter or battery storage** is also connected to the grid.
- Control Unit:** The **AC•THOR** control unit is connected to the system via **RJ45** (CAT5 or CAT7 cable).
- System Components:** The system includes a **Wechselrichter / Inverter oder Batteriespeicher / Battery storage** (F1 / RCD) and a **PV-Anlage PV-Generator**.
- Router:** A **Router** is connected to the system via **RJ45** (CAT5 or CAT7 cable).
- Label:** The diagram is labeled **Hausnetz & PV Private Grid & PV**.

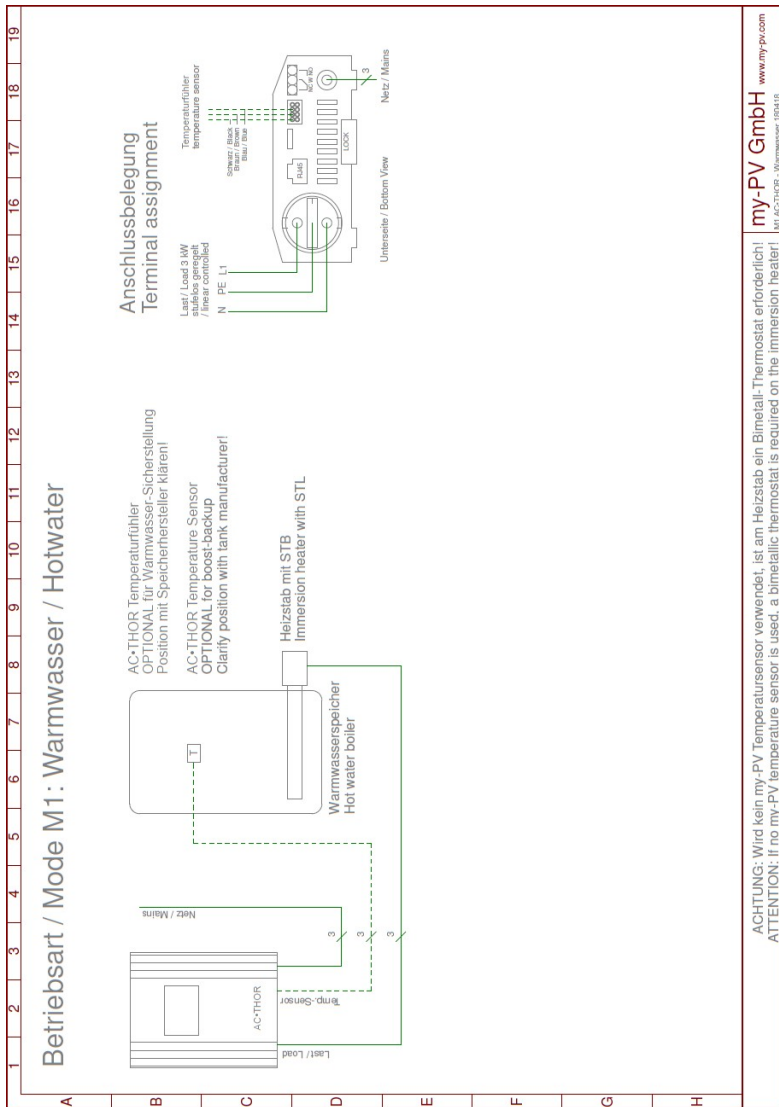
www.my-pv.com
Anschluss Inverter oder BMS 180418

Control by the energy management system

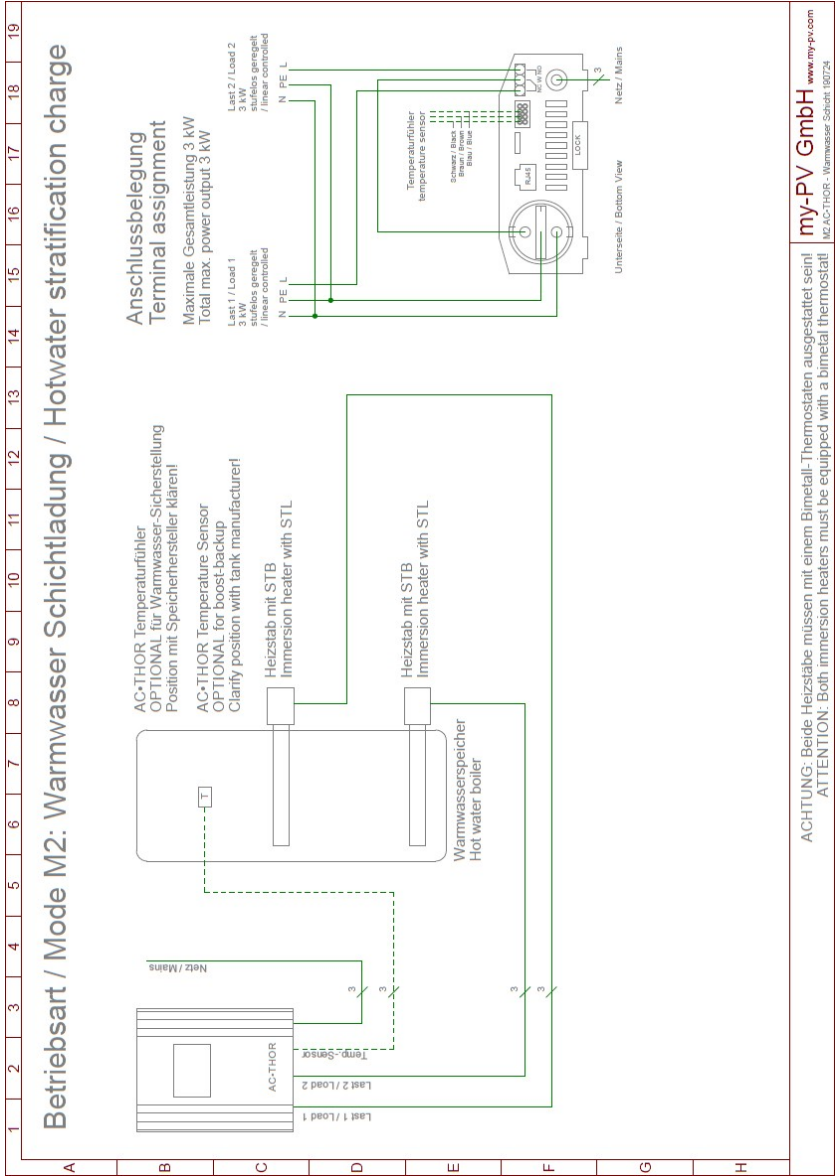


15.2. AC•THOR®i Wiring applications

Operating mode M1: Hot water 3 kW



Operating mode M2: Hot water stratification charge



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

Betriebsart / Mode M4: Warmwasser + Wärmepumpe Hotwater+ heatpump

Anschlussbelegung
Terminal assignment

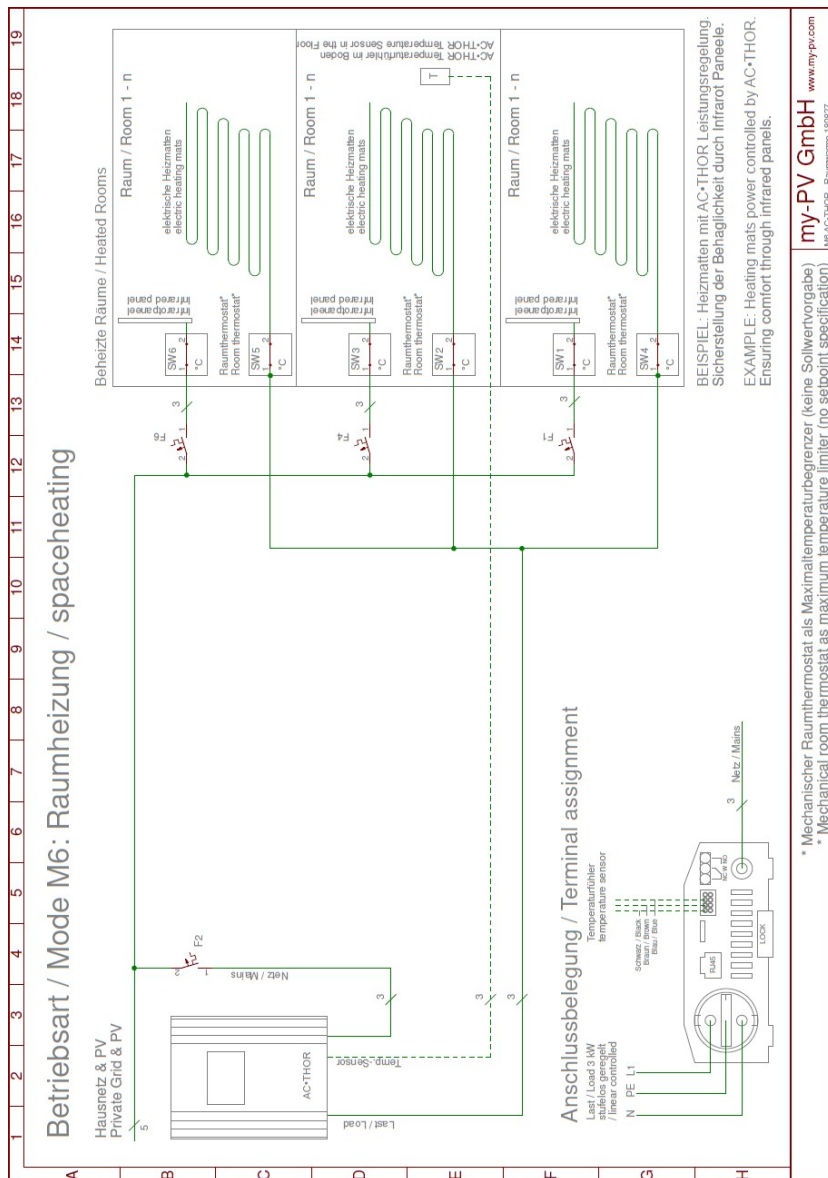
Anschlussbelegung
Terminal assignment

ACHTUNG: Wird kein my-PV Temperatursensor verwendet, ist am Heizstab ein Bimetall-Thermosist erforderlich!
ATTENTION: If no my-PV temperature sensor is used, a bimetallic thermostat is required on the immersion heater!

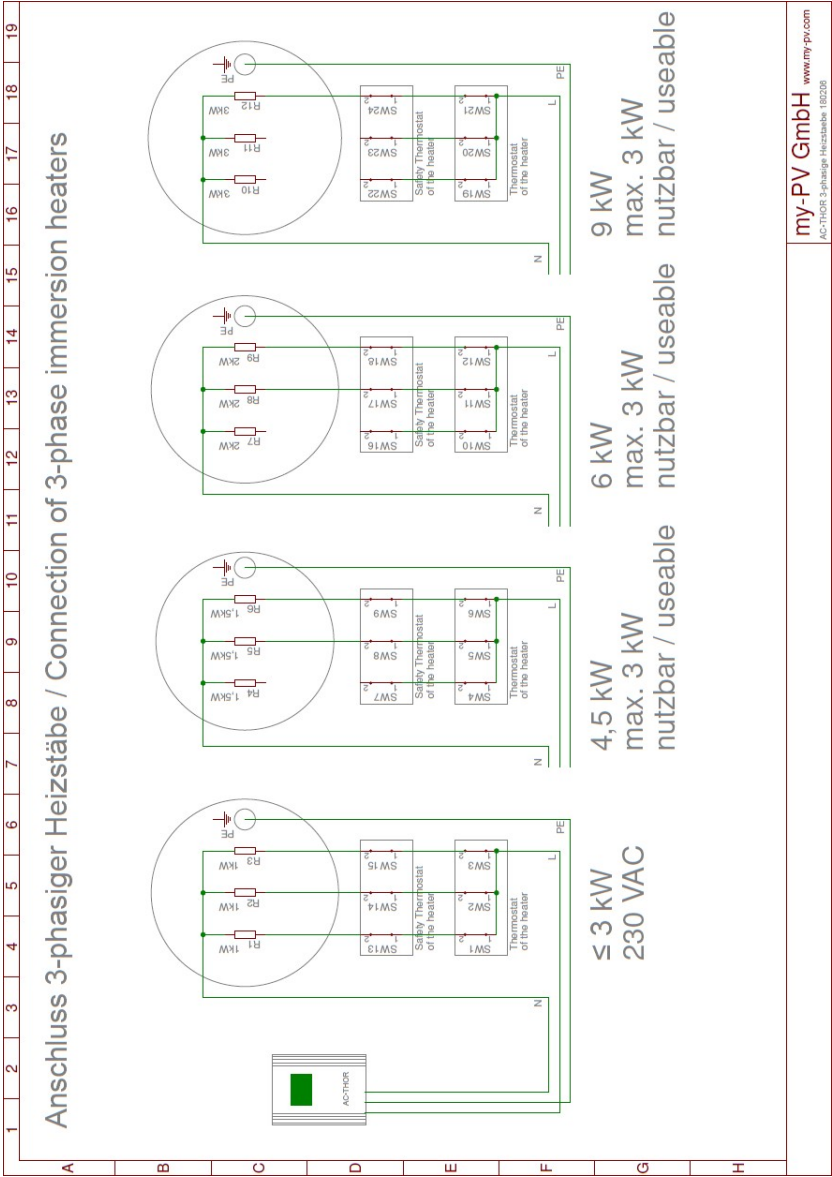
my-PV GmbH
www.my-pv.com
M4 - R - Warmwasser WPF 190802

[illegible]

Operating mode M6: space heating



Connecting three-phase heating elements



16. Installation Details / Product Registration

Name of licenced electrician:

Company Name:

Electrical license number:

Date of installation:

Signature of installer:

Certificate of Electrical Safety (COES):

Visit Energy Smart Water to register your product www.esw.net.au

Notes: