ELWA®

Photovoltaic Water Heater



Assembly- and Operation Manual

Intended Use

The electric hot water device ELWA is designed to be used with photovoltaic arrays up to 2.5 kWp nominal power.

ELWA should be mounted on conventional hot water tanks or storage tanks with a minimum capacity of about 150 litres.

The device does not feed any power to the grid. A permission of the grid operator or the utility is NOT required.

Any use different from that described above may lead to damage and can even cause short circuits, electric shocks or fire. Safety instructions of this manual must be followed strictly!

The device fulfils national and European regulations. Company and product name are trademarks of my-PV GmbH. All rights reserved.

Scope of Supply

- Photovoltaic Water Heater ELWA
- IP21 Cover
- 1 set MC4 Connectors
- Assembly- and Operation Manual

⚠ Safety Instructions

Always comply with local regulations for mounting and connection.

Any damage caused by ignoring the installation and user manual is not covered by the manufacturer´s warranty.

Permanent equipotential bonding of the device and the storage tank is mandatory.

Never switch on the device if the heating rod is not fully immersed.

The device is intended for use in a dry environment, the enclosure must not get wet or moist. Danger of electric shock!

Never use the device where ammonia is present.

Never use the device in a dusty environment.

Never cover the ventilation holes of the enclosure.

Always mind the mounting position: heating rod horizontal, power cord bottom

Avoid high (>40°C) and low (<5°C) ambient temperatures during storage and operation of the device. Avoid direct sunlight.

Never exceed the maximum DC input voltage (360V).

The thermal fuse blows at approx. 100°C and deactivates the device permanently.
Caution when using in unpressurized tanks!

AC supply must be fused 10 to 16A.

In commercial facilities electrical installations have to comply with all local regulations.

Exemption of Warranty and Liability

Any warranty or liability is exempted for:

- Injury to persons and/or damage to property caused by unintended use or in disregard of safety- and user instructions
- Consequential damage
- Unauthorized modification, disassembling or other conversion of the device
- Damage caused by calcium deposits on heating element.
- Damage caused by corrosion at heating element.

Assembly and Installation Instructions

The installation of the device must only be carried out by authorized technical staff.

The storage tank must be drained properly.

ELWA is intended for horizontal mounting in hot water or storage tanks with 1 ½ inch standard female threads.

The unheated section of the heating rod is 100mm from sealing face, the length of the thread pipe must not exceed 90mm.

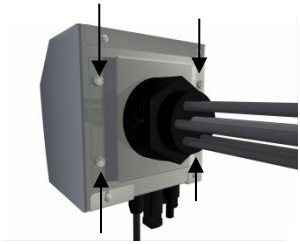
The pre-assembled O-ring seal has to be used; it must not be treated with lubricants. Do not apply force when screwing in the entire device until the seal is slightly pressed. Make sure that the O-ring is properly placed in its groove. Then tighten the heating rod with a 60mm spanner.
If the sealing with the O-ring is not possible, other sealants may be used on the thread.
The tightening torque must not exceed 50 Nm.

⚠ Never tighten the heating rod by turning the metal case of the device!

If an adapter flange is used on the tank, we recommend a flange plate made of stainless steel or at least of an enamelled material. Otherwise corrosion could occur on the heating elements, but this is excluded from the warranty.

If the device is not upright (power cord bottom) after the thread has been tightened, it can be turned gently left or right.

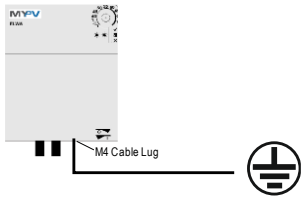
Then tighten the 4 lock nuts to fix the device:



Make sure that the heating rod is fully immersed when filling the water tank. Check for leakage.

Electrical Connection

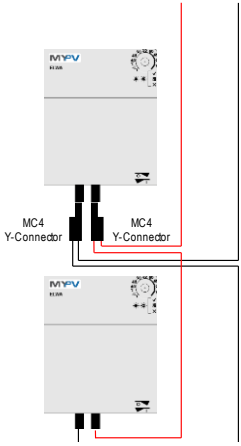
1. Earth (ground) the storage tank according to local regulations.
2. Connect Earth (ground) wire to the grounding screw of the device with a minimum wire section of 1.5mm² (AWG15). Test the ground conductor resistance according to the local regulations (Protection Class 1):



3. Make sure that the device is switched off.
4. Connect MC4 DC wires with correct polarity. Wrong polarity does not cause any damage, but the device will not work.
5. Connect AC plug if boost backup heating is desired.

Electrical Connection Stratification Charge

1. Earth (ground) the storage tank according to local regulations.
2. Connect Earth (ground) wire to the grounding screws of both devices with a minimum wire section of 1.5mm² (AWG15). Test the ground conductor resistance according to the local regulations (Protection Class 1) (see above).
3. Make sure that both devices are switched off.
4. Connect DC wires as shown below:



Both ELWAs are connected in parallel!

MC4 Y-connectors not supplied.

5. Connect MC4 DC wires with correct polarity. Wrong polarity does not cause any damage, but the device will not work.
6. Connect AC plug of the **upper** ELWA if boost backup heating is desired.

Controls and Indicators



Main switch



Rotary knob for temperature adjustment

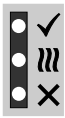
LED green Target temperature reached

LED yellow Normal operation

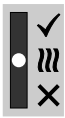
LED red Error

Rotary knob and indicators

Operating Status Indicator

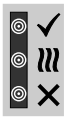

Startup
(~ 7 sec)


Standby


Heating from DC


Boost-
Backup


Heating finished, target temperature reached


Setup Mode
(see p 5,6)


Error
(see p 6)

Legend:


LED on
LED flashing
LED off

Start-up

Normal operation without boost backup (AC plug not connected)

Remark: It takes several minutes to start-up ELWA after connecting the DC. The green LED flashes (Standby).

1. Adjust desired solar target temperature
2. Switch on main switch (Device starts operating several minutes after the DC has been connected and solar power is available)
3. Device returns to normal operation ▶ LED yellow on
4. If target temperature reached ▶ Device switches off, LED green on

Normal operation with boost backup (AC plug connected)

Boost backup ensures reaching the AC target temperature in the afternoon independently of sun power.

⚠ **This function is designed for the additional heating of the hot water during summer for private applications. For commercial use, especially year-round operation, please contact my-PV.**

AC target temperature is factory preset to 50°C. See next chapter to change.

The next boost backup cycle starts in the afternoon of the next day. If a manual reheat is required (e.g. in the evening), simply switch the device off and on again. This activates the boost backup cycle.

Remark: If you first connect DC it takes several minutes to start-up the device (LED green flashing)

1. Set rotary knob to desired solar target temperature
2. Switch on main switch (Device starts operating several minutes after the DC has been connected and solar power is available)
3. Device returns to normal operation ▶ LED yellow on if solar powered,
   ▶ LED yellow flashes if backup powered
4. If target temperature reached ▶ Device switches off, LED green on

Adjusting the boost backup target temperature (factory preset to 50 °C)

1. Switch off main switch

2. Adjust rotary knop to „spanner“ position (far left)
3. Switch on main switch ▶ all 3 LEDs flash (Setup Mode)
4. Set rotary knob to desired reheat temperature
   ▶ LEDs flash alternately red/green and yellow
5. Switch off main switch ▶ backup temperature is saved
6. Set rotary knob to desired solar target temperature
7. Switch on main switch ▶ Device returns to normal operation

Stratification Charge with two ELWAs

ELWA is factory preset to operate as a single device or as an upper device in stratification charge mode.

The lower ELWA has to be set as follows:

1. Switch off main switch
2. Adjust rotary knop to „spanner“ position (far left)
3. Switch on main switch ▶ all 3 LEDs flash (Setup Mode)
4. Adjust rotary knop to  position
   ▶ LEDs run from top to bottom
5. Switch off main switch ▶ Setting is saved
6. Set rotary knob to desired solar target temperature
7. Switch on main switch ▶ Device is in standby mode (green LED flashing) until activated by upper device

This setting can be reversed by following the above procedure by setting to  symbol.

Error Displays

The red LED indicates different error conditions by flashing:

1x flash ▶ Over temperature fuse blown. Call your installer for service.

2x flash ▶ Water temperature above 90°C. Device stops and will restart heating when the temperature has fallen.
Note: The water temperature is close to the over temperature fuse threshold. IF the water has been heated by external heat sources, adjust the maximum temperature threshold of this source to 90°C.

3x flash ▶ Electronic circuit over temperature. Device switches off and restarts after cool-down.

4x flash ▶ Error of the electronic circuit or the heating rod. Call your installer for service.

5x flash ▶ DC isolation fault (either solar array or heating rod). Call your installer for service.

6x flash ▶ Temperature sensor fault. Call your installer for service.

Maintenance

Use in limy water can lead to lime scale deposition at the heating rod especially of the target temperature is set above 60°C. We recommend an annual check. Dismantle device from storage tank and remove lime deposition. Never scratch the heating rod surface (corrosion might arise).

Troubleshooting

The device does not contain any user serviceable parts. Call your installer for service.

Disposal



Keep packaging box or dispose properly.
Dispose the device according to legal regulations at the end of lifetime.

EU Declaration of Conformity

You can find them at any time on **www.my-pv.com**

Technical Data

DC	
DC-voltage	100 - 360 V (max.)
MPP-range	100 - 360 V
Number of MPP trackers	1
Max. input current	10 A, internally limited
Nominal power	2,000 W at 25°C ambient temperature, derating at overheat
DC inputs	Original MC4, 1 string
MPP- efficiency	99,8 %

AC	
Heating power	see nameplate
Power connection	Single phase, grounded plug, 230 V, 50-60 Hz
Recommended fuse	10 – 16 A
Power cord	2,7 m
Standby-power consumption	0 W at DC operation, <2 W at AC operation

General Data	
Operating pressure	max. 10 bar (1MPa)
Overall efficiency	>99% at nominal power
Protection class	IP20 (IP21 with Cover)
Operating temperature range	5 °C to 40 °C
Operating display	3 LED's
Interface	Serial IR Interface
Dimensions (WxHxD)	130 x 180 x 600 mm incl. heating rod
Heating rod length	45 cm
Heating rod thread	1 ½ inch
Weight	2 kg with power cord, without carton

The latest version of these assembly instructions is available at www.my-pv.com.

Subject to change.

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