



# AE PV Heating Element

Screwing in Heating Unit

Installation Manual

Version 01.6

**Title**                                **AE PV Heating Element** Warm Water Generation

**Type of Documentation**        Installation Manual

**Purpose of the Documentation**    In this document the use of AE PV Heating element is described.

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# 1 About this Installation Manual

This installation manual is a part of the product



- ⇒ Read the installation manual before the installation of the device.
- ⇒ Keep the installation manual available near the device for the whole life time of the product.
- ⇒ Make the installation manual available for all the future users of the device.

## 1.1 Symbols and Markups

<input checked="" type="checkbox"/>	Prerequisite
⇒	One step user Instruction
1.	Multi step user Instruction
•	List
<b>Highlighting</b>	Highlighting within a text
↪	Result



## 1.2 Warnings


### 1.2.1 Structure of a Warning Message

 <b>WARNING</b>	<p><b>Type and source of the danger are described here.</b></p> <p>⇒ Here are the measures to avoid the danger.</p>
<b>Example</b>	
 <b>DANGER</b>	<p><b>Death or severe personal injury due to high leakage current while opening the device.</b></p> <p>⇒ It is necessary to generate earthing before connecting to power supply circuit.</p>

### 1.2.2 Class of Warnings

There are three classes of warnings.

 <b>DANGER</b>	<p>“DANGER” indicates a security note, whose violation immediately leads to death or severe personal injury!</p>
 <b>WARNING</b>	<p>“WARNING” indicates a security note, whose violation can lead to death or severe personal injury!</p>

 <p><b>CAUTION</b></p>	<p>“CAUTION” indicated a security note, whose violation can lead to material damage or minor personal injuries!</p>
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### 1.3 Note



**Note:** A **Note** describes information, which is important for the optimal and economical operation of the system.

## 2 Security Note

### 2.1 Introduction


The following notes are should be considered before the installation of a device for avoiding personal damage and/or material damage. The security notes should be considered every time.

Before the installation and start up of this device, all the subsequent documents should be read.

In case of sale, loan or other transmission of the device the product documentation should also be attached.

### 2.2 Usage as Per Determination

AE PV Heating element should be used only with the provided AE PV Heater DCLV.

 <p><b>WARNING</b></p>	<p><b>Danger of infection due to water, which is not enough disinfected.</b></p> <p>⇒ The thermal disinfection should be guaranteed by the existing heating system.</p>
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The screwing in heating element is part of AE PV Heater DCLV and is used for the heating of water in the house equipment. By its structure the screwing in heating element is suitable for the operation in the warm water storage as well as in enameled drinking water storage, which are designed with a 1.5 inch screwed connection and this screwed connection has been provided with the help of an adaptor for revision opening. The screwing in heating element is available for the operation in the unpressurised and pressurized hydraulic systems from 80 liters capacity till a maximum operation pressure of 10 bars.

The screwing in heating element should be used only with the AE PV Heater DCLV. Each usage except this is not valid as per the approval.

The AE PV Heater DCLV serves as an **Additional Heating System** in warm water storage or in drinking water storage in case of central heating system with primary heat generator (oil, gas or solid fuel heaters). Both the types are described as warm water saving. The heating requirement exceeding from the available solar capacity is covered by the primary heat generators. The system linking ensures temperature sensitivity, this means as long as the maximum permitted storage temperature is allowed and solar radiation is available, the AE PV Heater delivers the heat. If the maximum permitted storage temperature is exceeded on the central heat sensor of AE PV Heater then the heat supply is interrupted. If the storage temperature for comfort is exceeded, then the primary heat generator is responsible for the delivery of heat energy. Also weekly disinfection of the drinking water (Legionella protection) takes over the primary heat generator.

However, the AE PV Heater DCLV can be set as solar island system for heating water generation e.g.

in a mountain shelter or in a garden house. In this case it is to be considered that the dimensioning of the system or the hot water usage behavior should be aligned in such a way that the storage water temperature of 60°C will be achieved once in a week for the Legionella protection.

The pipes of screwing in heating element consist of a high corrosion resistant of special alloy. In order to guarantee the possibly long life, we recommend the usage of processed, softened heating water as per VDI2035.

While operating the screwing in heating element in drinking water storage, it is to be calculated as per the hardness grade of the drinking water with the strong lime deposits on the heater rod. So that the life of the screwing in heating element can be considerably shorten. In order to avoid this, we recommend the following in case of drinking water storage:

- Never configure the maximum temperature of AE PV Heater DCLV above 60°C.
- Clean the warm water storage every two years using the revision opening of depositions and sediments.

### **2.3 Qualification of the Personnel**

The screwing in heating element should be installed only by qualified heating engineers. The heating engineer should be enough familiar with the fitting, installation and operation of the product as well as all the warnings and security measures as per this operation manual. They should have proper security equipments and should be the first one to help.

### **2.4 Operating Temperature**

The Messing-Nipple can increase the temperature of the storage water. The maximum water temperature for the screwing in heating element is 85°C.

The primary heating system (especially important in case of solid boilers) should not heat up the water above the maximum temperature of 85°C on screwing in heating element of AE PV Heater DCLV at any point of time. Temperature more than 85°C can lead to the safety shutdown of the device.

After the safety shutdown the device is switched off for the remaining day. If the safety shutdown takes place for 7 consecutive days, then the device can be start up again only by the customer service.

### **2.5 Structure of Hot Water Storage**

The maximum operating pressure for the screwing in heating element includes 10 bars.

An exceeding of the maximum pressure by obstacles in the flowing system should be closed immediately.

The screwed coupling should be shorter than the unheated zones of heating rod, in order to prevent the overheating and corrosion of the screw-in heating element.

### **2.6 Disclaimer**

There are general conditions for the deliveries and services of REFUsol GmbH.

- REFUsol GmbH does not take the responsibility of the damage in terms of not following the warnings in this installation manual or usage beyond the approved usage.
- The PV Heaters have water as well as the electrical contact. Any changes with exception of the allowed exchange of heating rod with an original REFUsol- additional heating rod (subsequent: changes) on the PV Heaters are endangered, therefore their secured function and possible damages are covered. Especially it threatens the life risk in case of changes on

the PV heaters.

- Therefore, it is recommended not to undertake any changes or repairs on the PV heaters. REFUSol is not responsible, if damage takes place due to a change or repair on a PV heater. Changes on the PV Heaters lead to the termination of guaranty claims, if the changes are not covered under guaranty conditions.
- Before the installation, the operational, warnings and security notes should be read.
- The perfect and secured operation of this device implies proper and competent transport, storage, fitting and installation as well as careful handling and maintenance.
- Accessories - spare parts provided by the manufacturer are acceptable.
- The security measures and clauses of the county, in which the system is used, should be considered.
- The environment conditions given in the product documentation should be maintained.
- For the European countries the EG-policy 2004/108/EG (EMV-Policy) should be considered while operating the device.
- The technical data, the measuring, connection and installation conditions are to be read from the product documentation and to be adhered to.
- For damages in relation to the high violence and disaster situation no liability is assumed.

### 3 Scope of Delivery

#### 3.1 Packaging Content

PCs.	Name	Item No.
1	AE PV heating element for AE PV Heater DCLV – Set including Double-Temperature sensor	0034480
1	Gasket for AE PV Heating element	0034478
1	Installation manual	0034479


The AE PV heater used in addition is delivered in a special packing.

#### 3.2 Unpacking and Checking the Delivered Material

⇒ Check the complete packaging content as per 3.1.

In case of incomplete delivery or damage the installation and operation is not recommended. In this case contact REFUSol/Service.

## 4 Installation

 <b>WARNING</b>	<p><b>Risk of injury or Property Damage due to Improper Installation.</b></p> <ul style="list-style-type: none"> <li>⇒ The immersion heater must be installed only by trained and qualified heating installers.</li> <li>⇒ The low-impedance grounding of the immersion heater on the local potential equalization for the purpose of the insulation monitoring is to ensure and document.</li> <li>⇒ Note safety instructions in chapter 2, page <b>Fehler! Textmarke nicht definiert.</b></li> </ul>
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### 4.1 Tools Required

Standard tool and key SW 60.

### 4.2 Installation Instructions

For the utilization of the maximum energy storage capacity, a installation position is as low as possible makes sense in the heating water tank or drinking water storage. For many drinking water storage is an enameled connection flange for the inspection opening 1.5 "internal thread available to achieve a deep position. The energy storage capacity of water is 0.116 kWh per degree per 100 litres water volume.

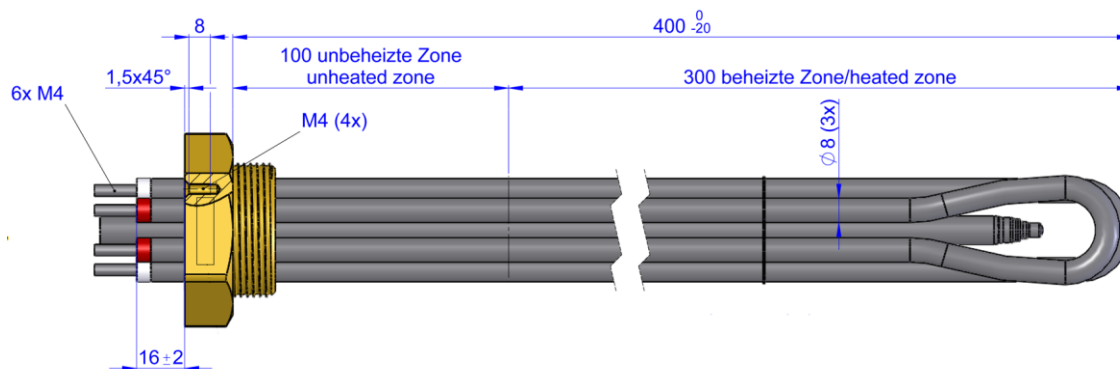



Figure dimensions in mm

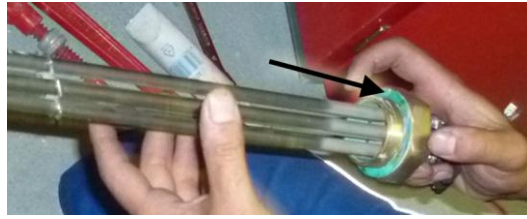
### 4.3 AE PV Install Screw-in Heater at the Hot Water Tank

 <b>WARNING</b>	<p><b>Risk of injury or Property Damage due to Incorrect Installation Position or Overheating.</b></p> <ul style="list-style-type: none"> <li>⇒ Install horizontal screw-in heaters.</li> <li>⇒ Make sure that the heating rods of the screw-in heater are surrounded in the operation by water and the water level is at least 20 mm above the heater rods.</li> </ul>
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The sealing is done with the supplied sealing ring.



1. Install seal ring (arrow).



2. Screw Immersion heater in the screw socket.
3. Tighten Immersion heater with key SW 60, without damaging the sealing ring by squeezing (Recommended torque 60 Nm).
4. Fill with enough water.
5. Check tightness.

## 5 Maintenance

A special maintenance of the immersion heater is not required. Check once in a year:

- Connection cable on fixed connection
- Cable damage
- Fragility of cables
- Remove deposits on the immersion heater, such as E.g. calcification if necessary.
- The reliability of the hot water tank must be ensured within the framework of regular maintenance and inspection by a specialist.

## 6 Dismantling and Returning

The dismantling takes place in reverse order as the Assembly.

Carefully pack the screw-in heater for returns under warranty.

## 7 Disposal



Dispose of the packaging and parts replaced in accordance with the regulations of the country where the immersion heater has been installed.

Do not dispose of the appliance with the household waste!

The device is RoHS - compliant. Thus the device can only be delivered to local sites for the disposal of household appliances. REFUso! GmbH take back the device completely. Please contact for the service!



## 8 Technical Data

Technical Data	AE PV Heating Element
<b>MECHANICAL DATA REFUsol Screw-in Heater</b>	
Material Heating Rod	high-quality nickel-iron-chromium alloy
Maximum Operating Pressure, bar	10
Unheated Area, mm	100
Dimension Length / Diameter, mm	400 / 40
Connection Thread	1 ½"
Fitting Length, mm	14
Use	Drinking water, deionized heating water to VDI 2035
Weight, kg	1,0

## 9 Spare Parts

Spare parts can be ordered from the AE REFUsol service hotline.

PCs.	Name	Item No.
1	AE PV heating element for AE PV heater DCLV - Set including Double Temperature sensor	0034480
1	Double- Temperature sensor PT1000 for AE PV Heating element	0034473
1	Seal for AE PV Heating element	0034478

## 10 Contact

Questions regarding errors or technical problems please contact:

Service-Hotline: +49 7123 969-202 (on working days from 8:00 – 17:00 O'clock)

Fax: +49 7123 969-30202

Email: [service@refusol.com](mailto:service@refusol.com)

## 11 Certificates

The EG declaration of conformity is available on the homepage of the REFUsol GmbH [www.refusol.com](http://www.refusol.com) available for download.

The AE PV heating element has been successfully tested according to the following test basics of the DVGW (German Association of gas and water compartment):

UBA KTW: UBA "KTW Leitlinie" from 07.10.2008

UBA BESCH-LL: UBA (Coating guideline) from 30.11.2010

UBA ELASTOM: UBA (Elastomer guideline) from 22.12.2011

## 12 Warranty

### WARRANTY CERTIFICATE for PV Heater

We hereby provide a warranty that, if the PV heater breaks down or suffers from a malfunction, we will exchange it on the terms outlined below:

**Duration of the Warranty: 2 Years**

1. The REFUsol manufacturer's warranty shall commence upon the PV heater first being commissioned. The warranty shall end upon the expiry of the warranty period.
2. We guarantee that, if the PV heater should break down or malfunction should occur during the warranty period we will send the holder of the warranty a replacement device on the following terms, either ourselves or through a company instructed by us. REFUsol shall be entitled to supply a replacement product, either of identical construction or otherwise a compatible device from a successive series in the same performance category.
3. In order to assert the warranty claim, the failure or malfunction of the device is to be notified to the REFUsol helpline by e-mail, telefax or letter, presenting a copy of the sales receipt.
4. Once a guarantee case has been filed, REFUsol will, either itself or through a company instructed, send the warranty holder a replacement product together with a return delivery note. The replacement product will be free of charge for the holder of the warranty if a warranty claim actually exists (breakdown of the device or malfunction that does not fall under Clause 7), and the holder of the warranty sends the device complained about, with a legible model identification plate, together with a copy of the sales receipt, in the container in which the replacement product was delivered, to the address given on the return delivery note, no later than 10 business days after delivery of the replacement product.
5. The costs of sending the equipment back and forth from/to the site of the product complained of are to be borne by the warranty holder.
6. This warranty does not cover any claims not expressly mentioned in this certificate of warranty.
7. The warranty does not cover any defects caused by modifications to or intervention with the device undertaken by individuals not authorised by REFUsol in this respect, defective installation or commissioning by the holder of the warranty or a third party, not adhering to the instructions given in the operating manual (e.g. the rules in regard to shipping, packaging, storage, protection from corrosion, handling, installing, commissioning and use), technical specifications and any pertinent safety regulations, improper use or Acts of God (e.g. being struck by lightning, excess voltage, storm, fire, being nibbled by rodents, etc.). Also excluded from the warranty are any defects in construction based on instructions given by REFUsol's customer if REFUsol had pointed the risks out to the customer in writing, as well as the usual wear and tear of the heating element. The usual wear and tear of the heating element shall primarily also depend upon the water hardness, and shall, for technical reasons, be increased with increased or decreased water hardness.
8. The holder of the manufacturer's warranty may transfer its rights and obligations arising from this warranty to third parties. REFUsol shall likewise be entitled to assign any rights and obligations arising from this manufacturer's warranty to third parties.
9. Should it transpire that no warranty claim exists, or should the warranty holder making a claim not fulfil its obligations, REFUsol shall be entitled to charge the warranty holder for any expenditure incurred to REFUsol through the warranty claim being asserted, including the costs of the replacement product.
10. This manufacturer's warranty is governed by German law, with the exception of German international private law. It does not limit the warranty claims of REFUsol's customer, and is given in addition to the customer's warranty claims.



All information without guarantee.  
Technical changes and errors  
excepted.

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