



## Installation and operating instructions

Temperature differential controller

2 inputs, 1 output

719450



EN



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These operating instructions are part of the product.

- ▶ Read these operating instructions carefully before use.
- ▶ Keep them over the entire lifetime of the product
- ▶ and pass them on to any future owner or user of this product.

# 1 About this manual

## 1.1 Applicability

This manual describes the installation, commissioning, function, operation, maintenance and dismantling of the temperature differential controller for solar thermal energy systems. When installing the remaining components, e.g. the solar collectors, the pump assemblies and the storage unit, be sure to observe the appropriate installation instructions provided by each manufacturer.

## 1.2 Users

Installation, commissioning, operation, maintenance and dismantling of the controller may only be performed by trained professional personnel. Before commissioning, the controller must be professionally assembled and installed by professional personnel in accordance with the applicable regional and transregional regulations as well as the safety instructions and general instructions within this installation and instruction manual. The professional personnel must be familiar with this operation manual.

The controller is maintenance-free.

Use the controller only after first thoroughly reading and understanding this instruction manual and the safety instructions. Adhere to all safety instructions. In the event of any ambiguities regarding the operation and alteration of parameters or functions, consult professional personnel.

## 1.3 Description of symbols




### 1.3.1 The structure of the warning notices

#### SIGNAL WORD

Type, source and consequences of the danger!

- Measures for avoiding danger.

### 1.3.2 Danger levels in warning notices

Danger level	Likelihood of occurrence	Consequences resulting from non-compliance
 DANGER	Imminent threat of danger	Death, serious bodily injury
 WARNING	Possible threat of danger	Death, serious bodily injury
 CAUTION	Possible threat of danger	Minor bodily injury
CAUTION	Possible threat of danger	Property damage

### 1.3.3 Notes

#### Note

Notes on easier and safer working habits.

- Measures for easier and safer working habits.

Pictogram with corresponding warning symbol.

### 1.3.4 Other symbols and markings

Symbol	Meaning
✓	Condition for action
▶	Call to action
⇒	Result of action
•	List
<b>Emphasis on issue at hand</b>	Emphasis on issue at hand

## 2 Safety

### 2.1 Proper usage

The temperature differential controller (below called controller) may only be used for controlling solar thermal systems within the permissible ambient conditions (see chapter 12).

### 2.2 Improper usage

The controller must not be operated in the following environments:

- outdoors
- in damp rooms
- in rooms where highly flammable gas mixtures can occur
- in rooms in which the operation of electrical and electronic components may cause dangers to arise

## 2.3 Dangers during assembly and commissioning

The following dangers exist during assembly / commissioning of the controller and during operation (in case of assembly errors):

- Risk of death by electrocution
- Risk of fire due to short-circuit
- Damage to any of the constructional fire safety measures present in the building due to incorrectly installed cables
- Damage to the controller and connected devices due to improper ambient conditions, inappropriate power supply and connecting prohibited devices or faulty devices and incorrect assembly or installation

Therefore, all safety regulations apply when working on the mains supply. Only electricians may perform work that requires opening the controller (such as connection work).

- ▶ When laying cables, ensure that no damage occurs to any of the constructional fire safety measures present in the building.
- ▶ Make sure that the permissible ambient conditions at the installation site are not exceeded (see chapter 12).
- ▶ Be sure to comply with the specified degree of protection.
- ▶ Factory labels and markings may not be altered, removed or rendered unreadable.

- ▶ Before connecting the device, make sure that the power supply matches the specifications on the type plate.
- ▶ Make sure that all devices which are connected to the controller conform to the technical specifications of the controller.
- ▶ Secure the device against unintentional commissioning.
- ▶ All work on an open controller must be performed with the mains supply disconnected.
- ▶ Protect the controller against overloading and short-circuiting.

## **2.4 Detecting faults**

- ▶ Check the display regularly.
- ▶ In case of faults, isolate the cause (see chapter 9).
- ▶ As soon as it becomes evident that safe operation is no longer possible (e.g. visible damage), remove the device from the mains supply immediately.
- ▶ Have professional personnel remedy the fault.

## **2.5 Exclusion of liability**

The manufacturer cannot monitor the compliance to this manual as well as the conditions and methods during the installation, operation, usage and maintenance of the controller. Improper installation of the system may result in damage to property and, as a result, in bodily injury.

Therefore, we assume no responsibility and liability for

loss, damage or costs which result from or are in any way related to incorrect installation, improper operation, incorrect execution of installation work and incorrect usage and maintenance.

Similarly, we assume no responsibility for patent right or other right infringements of third parties caused by usage of this controller.

The manufacturer reserves the right to make changes to the product, technical data or assembly and operating instructions without prior notice.



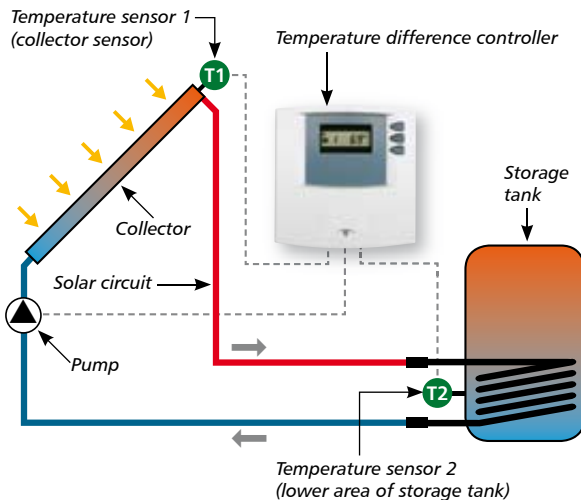
## 3 Description

### 3.1 Controller in the solar circuit

#### 3.1.1 The purpose of the controller

The controller controls the pump in a solar thermal system.

#### 3.1.2 The structure of the solar circuit



### 3.1.3 The function of the solar circuit

The controller constantly compares the temperatures between the collector (T1) and the lower area of the storage tank (T2) via temperature sensors. Once the sun heats the collector and there is a temperature difference of 8 K (adjustable parameter) between the collector and the storage tank, the pump is switched on.

The pump extracts the heat transfer fluid from the lower cooler area of the storage tank and pumps it to the collector. The heat transfer fluid in the collector is heated by the sun and flows back to the storage tank.

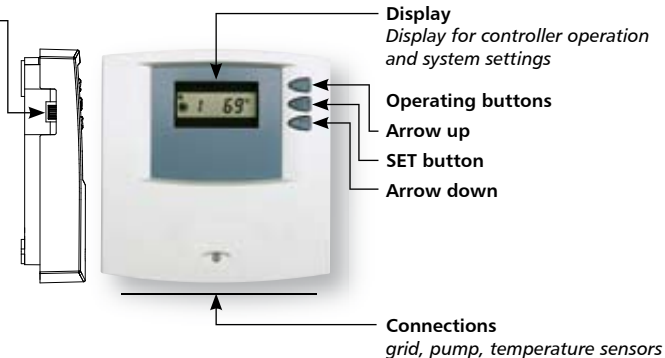
The heat transfer fluid heats the domestic water via a heat exchanger located in the storage tank.

### 3.2 Case overview

#### Operating switch

The following modes of operation can be selected:

- **On**  
for commissioning and testing for function
- **Auto**  
for normal operation
- **Off**  
to switch-off the pumps



## 4 Installation

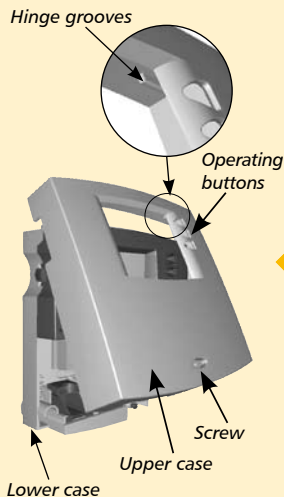
### 4.1 Opening / closing the case



#### **⚠ DANGER**

##### **Risk of death by electrocution!**

- ▶ Remove the controller from the power supply before opening the case.
- ▶ Make sure that the power supply cannot be unintentionally switched on.
- ▶ Do not damage the case.
- ▶ Only switch the power supply back on after the case has been closed.



The top of the case is held in place by two retaining pegs on the upper edge of the bottom half of the case and fastened with a screw.

#### 4.1.1 Opening the case

- ▶ Loosen the screw and remove the upper case in an upwards direction.

#### 4.1.2 Closing the case

- ▶ Place the upper case over the lower case at an angle. Insert the hinge grooves into the retaining pegs of the lower case.
- ▶ Pivot the upper case down and feed the operating buttons through the matching holes.
- ▶ Fasten the case tightly with the screw.

## 4.2 Assembly

### WARNING

Risk of electric shock and fire if assembled in a damp environment!

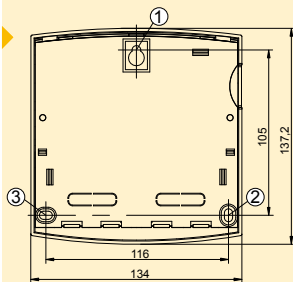
- ▶ Only assemble the controller in an area where the degree of protection is sufficient.

### 4.2.1 Assembling the controller

#### CAUTION

Risk of injury and damage to the case when drilling!

- ▶ Do not use the case as a drilling template.
- ▶ Choose a suitable installation site.
- ▶ Drill the upper fastening hole.
- ▶ Screw in the screw.
- ▶ Remove the upper case.
- ▶ Hang the case in the recess ①.
- ▶ Mark the position of the lower fastening holes ②, ③.
- ▶ Remove the case again.
- ▶ Drill the lower fastening holes.
- ▶ Hang the case up again in the recess ①.
- ▶ Screw the case firmly using the lower fastening holes ② and ③.
- ▶ Mount the upper case.





---

### 4.3 Electrical connection

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#### WARNING

##### Risk of death by electrocution!

- ▶ Remove the controller from the power supply before opening the case.
  - ▶ Observe all guidelines and regulations of the local electricity supplier.
- 

#### NOTE

The device is to be connected to the grid by means of a plug with grounding contact, or in the case of a fixed electrical installation via a disconnection device for complete disconnection in accordance with the installation guidelines

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#### 4.3.1 Preparing the cable feed

Depending on the type of installation, the cables may enter the device through the rear of the case or the lower side of the case.

## Feeding the cable through the rear of the case (diagram 1):

### WARNING

Risk of electrical shock and fire due to cables coming loose!

- ▶ Install an external strain relief for the cables.
- ▶ Remove the plastic flaps ⑦ from the rear side of the case using an appropriate tool.

## Feeding the cable through the lower side of the case (diagram 2):

### WARNING

Risk of electrical shock and fire due to cables coming loose!

- ▶ Fasten the flexible cabling to the case using the strain-relief clamps provided.
- ▶ Cut the left and right plastic flaps ⑥ using an appropriate tool and break them out of the case.

### 4.3.2 Connecting the cables

- ▶ If a protective conductor is provided or required for the pump, connect the protective conductor to the terminal clamps of the controller. When connecting the protective conductor, observe the following points:

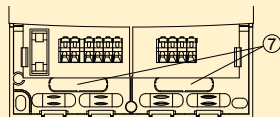


Diagram 1: Cable feed from the rear

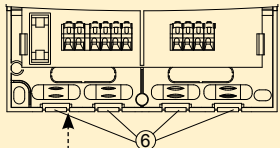
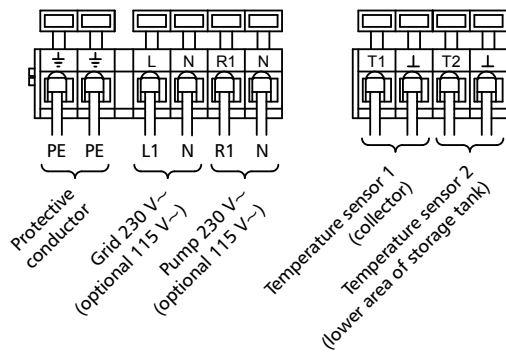


Diagram 2: Cable feed from below

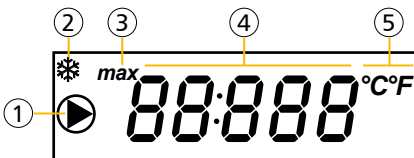
- Make sure that the grounding contact is also connected to the controller's mains supply side.
- Each terminal may only be connected to a single connecting wire (max 2.5 mm<sup>2</sup>).
- The terminals are suitable for connection without sleeves; stranded wires are to be twisted (1 twist per 20 mm)
- ▶ Only use the original temperature sensors (Pt1000) that are approved for use with the controller.
- ▶ Observe the following points:
  - The polarity of the sensor contacts is not important.
  - Do not lay sensor cables close to 230 volt or 400 volt cables (minimum separation 100 mm).
  - If inductive effects are expected, e.g. from heavy current cables, overhead train cables, transformer substations, radio and television devices, amateur radio stations, microwave devices etc., then the sensor cables must be adequately shielded.
  - Sensor cables may be extended to a maximum length of 100 m.
- ▶ When using extension cables, select the following cable cross sections:
  - 0.75 mm<sup>2</sup> up to 50 m long
  - 1.5 mm<sup>2</sup> up to 100 m long
- ▶ Connect the cables in accordance with the terminal plan.

### 4.3.3 Terminal plan





## 5 Display overview



- ① Symbol for pump operation
- ② Symbol for anti-frost function (see p.21)
- ③ Symbol **max** for maximum storage tank temperature and maximum collector temperature (see p.19/20)
- ④ Display for temperature sensor, temperature readings and fault symbols (see p.31), interruption, or "SYS" = system fault (see p.31/32)
- ⑤ Temperature format [°C / °F] (see p.28)

## 6 Commissioning

### 6.1 Testing the pump

#### CAUTION

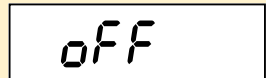
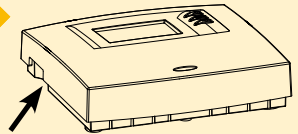
#### Damage to pump caused by dry operation!

- ▶ Make sure that the solar circuit is filled with heat transfer fluid.
- 
- ✓ The controller case is closed.
  - ✓ All connections are properly made.
  - ✓ The solar energy system is filled.
- ▶ Connect the mains supply.
  - ▶ To switch on the pump, set the operating switch to the upper position (on).
    - ⇒ *on* appears in the display. After approx. 3 seconds **on** flashes in alternation with the display.
  - ▶ To switch off the pump, set the operating switch to the lower position (off).
    - ⇒ *off* appears in the display. After approx. 3 seconds **off** flashes in alternation with the display.

#### CAUTION

#### The incorrect operating mode may cause the system to shut down or impair proper functioning!

- ▶ After testing the pump, always set the operating switch to automatic operation.






- ▶ To set the controller in automatic operation, move the operating switch to the middle position.
  - ⇒ **Auto** is shown in the display for approx. 3 seconds.

## 7 Description of the controller functions

### 7.1 Switch-on / switch-off temperature difference

The controller constantly compares the temperatures between the collector (T1) and the lower area of the storage tank (T2). As soon as the temperature in the collector (T1) is 8 K (adjustable in setup ⇒ P2 [K]) higher than the temperature in the storage tank (T2), and if no safety limits prohibit the pump from operating, the pump is switched on.

The following display appears:

- The pump symbol is displayed

If the temperature difference falls below 4 K (adjustable in setup ⇒ P3 [K]), the pump is switched off. The pump symbol is no longer shown in the display.

### 7.2 Maximum storage tank temperature

The maximum storage temperature function is to prevent the hot water tank from overheating. If the lower area of the storage tank (T2) reaches the set maximum



storage tank temperature (factory setting of 60 °C, ⇨ P1), charging is stopped. A temperature of 3 K below the maximum storage tank temperature must first be reached before charging can be resumed.

The following display appears:

- The display flashes **max**

Note: The display only shows max when temperature sensor T2 is also selected



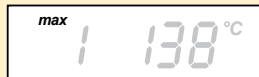
### 7.3 Maximum collector temperature

During periods of high solar irradiance, the temperature (T1) of the heat transfer fluid can exceed 130 °C. The heat transfer fluid evaporates. In this case, the pump is blocked for protection purposes until the temperature drops below 127 °C.

The following display appears:

- The display flashes **max**

Note: The display only shows max when temperature sensor T1 is also selected



### 7.4 Tube collector function (F1)

Due to its construction, the collector temperature (T1) can only be inaccurately recorded with vacuum tube collectors (in some cases there are no immersion sensors; the sensor is outside the collector pipe). In these cases, the solar circuit must be briefly activated at regular intervals to transmit the actual heat from the collector pipe to the sensor (T1). If the tube collector func-

tion is activated, the controller automatically switches the pump on every 30 minutes for 30 seconds.

### 7.5 Anti-freeze function (F2)

If the anti-freeze function is activated, the controller switches the pump on as soon as the collector temperature falls below  $+5\text{ }^{\circ}\text{C}$ . The heat transfer fluid is thus pumped through the collector and the system is prevented from freezing. If the collector reaches a temperature of  $+7\text{ }^{\circ}\text{C}$ , the pump is switched off again.

#### CAUTION

##### **System can freeze despite the activated anti-freeze function!**

During a power outage, the anti-freeze function does not operate.

During long-term periods of frost (due to restricted water tank heat storage).

If collectors are mounted in locations exposed to wind.

- ▶ If frost is expected for a long-term period of time, only operate the system with heat transfer fluid.

Standard heat transfer fluids for solar energy systems also contain an additional corrosion inhibitor.

The following display appears:

- The anti-freeze symbol is displayed



## 8 Operation



### CAUTION

The incorrect operating mode may cause the system to shut down or impair proper functioning!

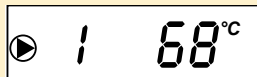
- ▶ Make sure that the operating switch is set to automatic operation.

On the display you can see the temperature readings of the individual temperature sensors. The controller settings may be set in the settings menu.

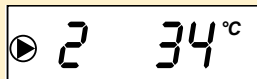
### 8.1 Reading the temperature values

- ▶ Select the temperature sensor using the  and  buttons ( $1=T1$ ,  $2=T2$ ).

⇒ *The selected temperature sensor and the current measured temperature appear in the display.*






*Temperature sensor T1 display with temperature reading from collector and active pump*




*Temperature sensor T2 display with temperature reading from lower area of storage tank and active pump*

## 8.2 Setting the controller

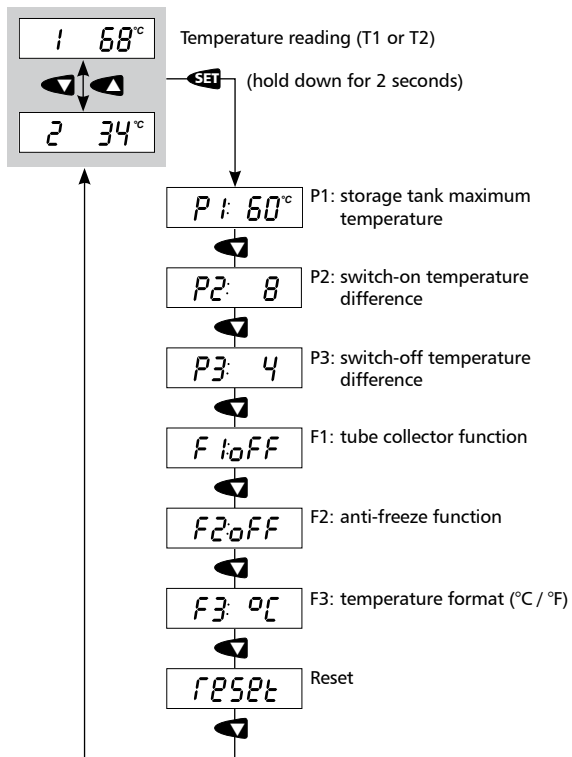
### 8.2.1 Using the settings menu

- ▶ To open the settings menu, press the  button for approx. 2 seconds.
  - ⇒ *Setting P1 "storage tank maximum temperature" is displayed.*
- ▶ To switch to the next setting, press the .
- ▶ To exit the settings menu, press the  button again until the temperature sensor and temperature reading are shown again.



P1: 60°C

## 8.2.2 Overview of menu settings





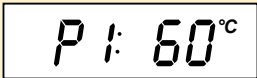


### 8.2.3 Setting the storage tank maximum temperature (P1)





#### DANGER

Risk of scalding due to storage tank temperature of over 60 °C!

- ▶ Install a thermostatic mixer in the hot water pipe and set to a maximum 60 °C.







P1: 60°C

- ✓ The P1 menu is open
- ▶ Press the  button for approx. 2 seconds until the storage tank maximum temperature flashes.
- ▶ Change the storage tank maximum temperature using the  or  buttons.
- ▶ To save the value, press the  button.

### 8.2.4 Setting the switch-on temperature difference (P2)

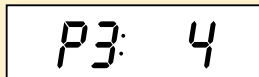


P2: 8

- ✓ The P2 menu is open
- ▶ Press the  button for approx. 2 seconds until the switch-on temperature difference flashes.
- ▶ Change the switch-on temperature difference using the  or  buttons.
- ▶ To save the value, press the  button.

### 8.2.5 Setting the switch-off temperature difference (P3)

- ✓ The P3 menu is open
- ▶ Press the **SET** button for approx. 2 seconds until the switch-off temperature difference flashes.
- ▶ Change the switch-off temperature difference using the **▲** or **▼** buttons.
- ▶ To save the value, press the **SET** button.

A rectangular digital display with a black border. The text "P3:" is on the left and the number "4" is on the right, both in a stylized digital font.

### 8.2.6 Activating the tube collector function (F1)

#### NOTE

Incorrectly setting the controller can compromise the efficiency of the solar energy system. Therefore, only activate the tube collector function if the construction of the collector does not allow its temperature to be recorded immediately and/or accurately (in some cases there are no immersion sensors; the sensor is outside the collector pipe).

- ✓ The F1 menu is open
- ▶ Press the **SET** button for approx. 2 seconds until either "oFF" or "on" flashes.
- ▶ Toggle between "oFF" and "on" using the **▲** or **▼** buttons.
- ▶ To save the setting, press the **SET** button.

A rectangular digital display with a black border. The text "F 1:" is on the left and "oFF" is on the right, both in a stylized digital font.

## 8.2.7 Activating the anti-freeze function (F2)

### CAUTION

#### System can freeze despite the activated anti-freeze function!

During a power outage, the anti-freeze function does not operate.

During long-term periods of frost (due to restricted water tank heat storage).

If collectors are mounted in locations exposed to wind.

- ▶ If frost is expected for a long-term period of time, only operate the system with heat transfer fluid.

For further information see chapter 7.5.



### NOTE

Incorrectly setting the controller can compromise the efficiency of the solar energy system.

- ▶ Only activate the anti-freeze function for solar energy systems that are not filled with anti-freeze.

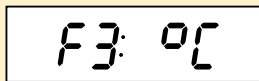


F2:OFF

- ✓ The F2 menu is open
- ▶ Press the **SET** button for approx. 2 seconds until either "oFF" or "on" flashes.
- ▶ Toggle between "oFF" and "on" using the  or  buttons.
- ▶ To save the setting, press the **SET** button.

### 8.2.8 Selecting the temperature format (F3)

- ✓ The F3 menu is open
- ▶ Press the **SET** button for approx. 2 seconds until either "°C" or "°F" flashes.
- ▶ Toggle between "°C" and "°F" using the **▲** or **▼** buttons.
- ▶ To save the setting, press the **SET** button.



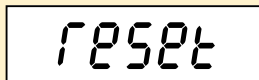
### 8.2.9 Reset

The reset function causes the controller to revert to its factory settings, these are as follows:

P1	P2	P3	F1	F2	F3
60	8	4	off	off	°C

- ✓ The RESET menu is open
- ▶ Press the **SET** button for approx. 5 seconds until "RESET" flashes.

The controller reverts to its factory settings.



## 9 Maintenance

The controller was conceived for years of continuous trouble-free operation. Nevertheless, faults may occur. Maintenance may only be performed by professional personnel.

In most cases, however, the fault does not lie with the controller, but rather with the peripheral components. The following description covers the most common problems encountered with the controller.

- ▶ Only send in the controller with a precise fault description if none of the following faults are present.

### 9.1 Fault causes



#### **⚠ WARNING**

**Risk of death by electrocution!**

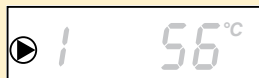
- ▶ Remove the controller from the power supply before opening the case.

**Controller does not appear to function at all.**

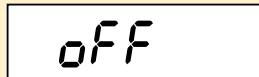
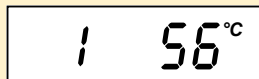
Secondary symptoms	Possible cause / remedy
<ul style="list-style-type: none"> <li>• The controller display is blank.</li> </ul>	No power supply is present <ul style="list-style-type: none"> <li>▶ Have professional personnel check the fuse and the supply cable.</li> </ul>

The pump, which is connected to the controller, is not running, although its switch-on conditions have been fulfilled.

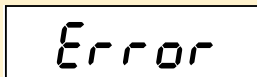
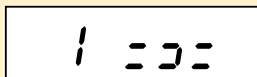
Secondary symptoms	Possible cause / remedy
<ul style="list-style-type: none"> <li>The pump symbol is shown in the display.</li> </ul>	<p>The pump connecting cable is not connected, interrupted or the fuse in the pump is burned out.</p> <ul style="list-style-type: none"> <li>▶ If necessary, have professional personnel replace the fuse.</li> </ul>
<ul style="list-style-type: none"> <li>The pump symbol is <b>not shown in the display</b>.</li> <li><b>Off</b> is displayed in alternation with the temperature reading</li> </ul>	<p>Operating switch is set to <b>Off</b></p> <ul style="list-style-type: none"> <li>▶ Set the operating switch to automatic operation.</li> </ul>



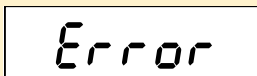
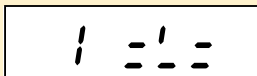
*Pump symbol display (example)*



*T1 temperature sensor with temperature reading and "off" display (example)*



*T1 temperature sensor  
with short-circuit symbol and  
warning sign (example)*



*T1 temperature sensor  
with interruption symbol and  
warning sign (example)*

## Short-circuit symbol and warning display appear.

### Possible cause / remedy

Temperature sensor T1 or T2 or its supply cable is short-circuited

- ▶ Have professional personnel check the supply cables of the temperature sensors and that they are correctly connected to the controller.

## Interruption symbol and warning signal appear.

### Possible cause / remedy

Temperature sensor T1 or T2 or its supply cable is interrupted

- ▶ Have professional personnel check the supply cables of the temperature sensors and that they are correctly connected to the controller.

"SYS" and the warning symbol flash in the controller display.

#### Possible cause / remedy

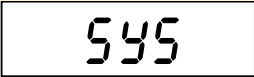
SYS means there is a system error. This means that despite the pump running, a temperature difference exceeding 80 K between the collector and the storage tank was recorded.

The following causes are possible:


- The pump is faulty or not correctly connected
- The isolating valve in the solar circuit is closed
- There is air in the solar circuit

Since a standard circulation pump cannot eliminate air bubbles inside the piping system, the heat transfer medium circuit comes to a standstill.

- ▶ Have professional personnel check the solar energy system to prevent damage.
- ▶ Once the fault has been remedied, press any button to acknowledge the fault message.



SYS



Error

*SYS display  
and warning sign (example)*



## 9.2 Testing the temperature sensors

### 9.2.1 Safety

Only professional personnel may test the temperature sensors.

### 9.2.2 Testing the resistance values

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#### DANGER

**Risk of death by electrocution!**

- ▶ Remove the controller from the power supply before opening the case.

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The temperature is recorded by resistance sensors. These are Pt1000 temperature sensors. Depending on the temperature, the resistance value also changes. A potentially defective sensor can be checked using an ohmmeter.

#### Measuring resistance values

- ▶ Disconnect the corresponding temperature sensor from the controller.
- ▶ Measure the resistance value. The typical resistance values, depending on the temperature, are listed in the following table. Please note that small deviations are permissible.



Temperature sensor resistance values						
Temperature [°C]	-30	-20	-10	0	10	20
Resistance [Ω]	882	922	961	1000	1039	1078
Temperature [°C]	30	40	50	60	70	80
Resistance [Ω]	1117	1155	1194	1232	1271	1309
Temperature [°C]	90	100	110	120	130	140
Resistance [Ω]	1347	1385	1423	1461	1498	1536
Temperature [°C]	150	160	170	180		
Resistance [Ω]	1573	1611	1648	1685		

## 10 Dismantling and disposal

### DANGER

#### Risk of death by electrocution!

- ▶ Remove the controller from the power supply before dismantling the controller.
- ▶ To dismantle the controller, follow the assembly instructions in the reverse order.
- ▶ Dispose of the controller in accordance with the regional regulations.



## 11 Legal warranty

The manufacturer assumes the following warranty obligations:

The manufacturer will rectify all manufacturing and material faults that occur in the controller and affect the correct functioning of the device during the warranty period. Natural wear and tear does not constitute a malfunction. No warranty claims can be accepted if a fault occurring after the purchase contract is made with the end user can be attributed to the end user or to third parties, especially in case of unprofessional installation or commissioning, incorrect or negligent handling, improper transport, excessive loading, use of improper equipment, faulty construction work, unsuitable construction location or improper operation or use. Warranty claims shall only be accepted if the specialist dealer is notified of the fault immediately after it is discovered. The manufacturer must be notified of the fault via the specialist dealer. A copy of the proof of purchase must be enclosed.

**A precise description of the fault is required for processing.**

The warranty expires 24 months after the purchase contract was made by the end user, unless the manufacturer expressly agrees to extend the period in writing.

The dealer's warranty based on the purchase contract with the end user is not affected by this warranty

obligation. The manufacturer can choose to fulfill the warranty either by repair or replacement. This does not include the costs incurred for exchange, shipping or re-installation. If the product can neither be repaired or replaced, or if this does not occur within a suitable period in spite of the specification of an extension period in writing by the customer, the reduction in value caused by the fault shall be replaced, or, if this is not sufficient taking the interests of the end customer into consideration, the contract is cancelled.

Any further claims against the manufacturer based on this warranty obligation, in particular claims for damages due to lost profit, loss-of-use or indirect damages are excluded, unless liability is obligatory by law.

## 12 Technical data

Temperature differential controller	
Operating voltage	230 V~ ( $\pm 15\%$ ), 50 Hz [optional 115 V ( $\pm 15\%$ ), 60 Hz]
Own consumption	$\leq 1$ W
Inputs	2 temperature recording (Pt1000)
Output	1 1 x relay switched output switching performance max. 800 W [230 V~]
Switch-on temperature difference	4 - 20 K (factory setting 8 K)
Switch-off temperature difference	2 - 18 K (factory setting 4 K)
Display	LCD-display (48 segments)
Degree of protection	IP 20/DIN 40050
Permitted ambient temperature	0 to +45 °C
Installation	wall-mounted
Weight	250 g
Case	recyclable 3-piece plastic case
Dimensions L x W x H [mm]	137 x 134 x 38
Temperature sensors 2 x Pt1000	1.5 m silicone cable (measuring range up to +180 °C)
Fuse	4 A MT, 250 V







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