

# TDC Smart E

## Temperature difference controller

### Installation and operating instructions



**Read carefully before installation, commissioning and operation**

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# Safety Instructions

## EU-Conformity

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By affixing the CE mark to the unit the manufacturer declares that the TDC Smart E conforms to the following relevant safety regulations:

- EU low voltage directive 2014/35/EU
- EU electromagnetic compatibility directive 2014/30/EU
- Radio Equipment Directive (2014/53/EU)

. Conformity has been verified and the corresponding documentation and the EU declaration of conformity are kept on file by the manufacturer.

## General Instructions

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### **Please read carefully!**

These installation and operating instructions contain basic instructions and important information regarding safety, installation, commissioning, maintenance and the optimal use of the unit. Therefore these instructions must be read and understood completely by the installation technician/specialist and by the system user before installation, commissioning and operation of the unit.

This unit is an automatic, electrical Temperature difference controller. Install the unit only in dry areas and under the ambient conditions described in "Specifications". Secure the device in a protected location where it is safe from impacts to the housing and glass display.

The device must not be installed in areas where there is dust or dirt. Occasionally remove dust build-up from ventilation slots or the surface of the housing, provided this can be done safely. Avoid splashing water or direct contact with moisture to prevent any risk to electrical safety.

The valid accident prevention regulations, VDE regulations, the regulations of the local power utility, the applicable DIN-EN standards and the installation and operating instruction of the additional system components must also be observed.

This device is classified as a Type 1 control in accordance with EN 60730-1 and does not perform any safety-related functions. It therefore in no way replaces any safety equipment that may need to be provided on site!

Before commissioning, read the data protection information § 11 at [sorel.de/en/terms-and-conditions/](https://www.sorel.de/en/terms-and-conditions/).

The device is intended for permanent installation. The electrical connection is made via internal terminals. If the product is supplied with a pre-assembled wiring harness, the cable is permanently connected and must not be removed.

Installation, electrical connection, commissioning and maintenance of the device may only be carried out by an appropriately trained specialist. Users: Make sure that the specialist gives you detailed information on the function and operation of the unit. Always keep these instructions in the vicinity of the unit.

The manufacturer does not take over any liability for damage caused through improper usage or non-compliance of this manual!

The safety of our products and the protection of our customers are our top priorities. If you discover a potential security vulnerability in one of our products, please inform us immediately. Please send your report to [cybersecurity@sorel.de](mailto:cybersecurity@sorel.de). Please describe the security vulnerability you have discovered in as much detail as possible and, if available, include steps to reproduce it. We will review your report immediately and contact you for further information if necessary. We will review your report immediately and contact you for further information if necessary.

## Explanation of Symbols

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Danger

Failure to observe these instructions may result in life-threatening effects due to electrical voltage.



Danger

Failure to observe these instructions can result in serious damage to health such as scalding or life-threatening injuries.



Caution

Failure to observe these instructions can result in destruction of the unit or the system, or environmental damage.



Caution

Information which is especially important for the function and optimal use of the unit and the system.

## Changes to the Unit

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- Changes, additions to or conversion of the unit are not permitted without written permission from the manufacturer.
- It is likewise forbidden to install additional components that have not been tested together with the unit.
- If it becomes apparent that safe operation of the unit is no longer possible, for example due to damage to the housing, the unit must be taken out of operation immediately.
- Any parts of the unit or accessories that are not in perfect condition must be exchanged immediately.
- Use only original spare parts and accessories from the manufacturer.
- Markings made on the unit at the factory must not be altered, removed or made illegible.
- Only the settings described in these instructions may be set using the Unit.



Changes to the unit can compromise the safety and function of the unit or the entire system.

## Warranty and Liability

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The Unit has been manufactured and tested with regard to high quality and safety requirements. The warranty and liability shall not include, however, any injury to persons or material damage that is attributable to one or more of the following causes:

- Failure to observe these installation and operating instructions.
- Improper installation, commissioning, maintenance and operation.
- Improperly executed repairs.
- Unauthorised structural changes to the unit.
- Use of the device for other than its intended purpose.
- Operation above or below the limit values listed in the 'Specifications' section.
- Force majeure.

## Disposal and Pollutants

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The unit conforms to the European RoHS 2011/65/EU for the restriction of the use of certain hazardous substances in electrical and electronic equipment.



Under no circumstances may the device be disposed of with the normal household waste. Dispose of the unit only at appropriate collection points or ship it back to the seller or manufacturer.

# Description TDC Smart E

## About the Controller

The Temperature difference controller TDC Smart E facilitates efficient use and function control of your Solar thermal systems with additional heating possible while its handling is intuitive. After every input step the suitable functions are matched to the keys and explained in a text above. The "System status and settings" menu contains keywords as well as help texts and graphics.

The TDC Smart E can be used for various system variants,( see 'Hydraulic Variants' on page 7

Important characteristics of the TDC Smart E are:

- Depiction of graphics and texts using a lit display.
- Simple viewing of the current measurement values.
- Statistics and system monitoring by means of statistical graphics
- Extensive setting menus with explanations.
- Menu block can be activated to prevent unintentional setting changes.
- Resetting to previously selected values or factory settings.


## Technical Data


Electrical specifications		
Power Supply		100 - 240VAC
Power consumption / standby		0,5 - 3W/ 0,5 W
Internal fuse	1	2AT 250V
Protection Class		IP40
Protection class / overvoltage category		II / II
Inputs		
Sensor inputs	3 PT1000	Measuring range (-50°C...300°C)
Outputs		
Potential-free relay up to 3 kW 230 VAC	1 / R	AC1 3000W at 230VAC (max 16A) / AC3 460W at 230VAC (max 2A)
0-10V/PWM	1 / V	designed for 10kΩ load / frequency 1kHz, level 10V
Connectivity		
WiFi		IEEE 802.11 b/g/n (2.4 GHz), up to 150 Mbps, WPA2/WPA3
App support		SOREL Connect App
Max. Cable Length		
Collector sensor		< 30 m
Other Pt1000 sensors		< 10 m
0-10V/PWM		< 3 m
Switch outputs / mains voltage		< 3 m
Permissible Ambient Conditions		
Controller operation		0 °C - 40 °C, max. 85 % rel. humidity at 25 °C
Degree of pollution category		2
Location		Dry indoor areas
Transport / Storage		0 °C - 60 °C, no moisture condensation permitted
Other Specifications and Dimensions		
Housing Design		3-part, ABS plastic
Installation Methods		Wall installation, optionally panel installation
Dimensions		116 mm x 86 mm x 37 mm
Display		TFT colour display, 2.4", 240 x 320 dots
Operation		Touch input (capacitive)

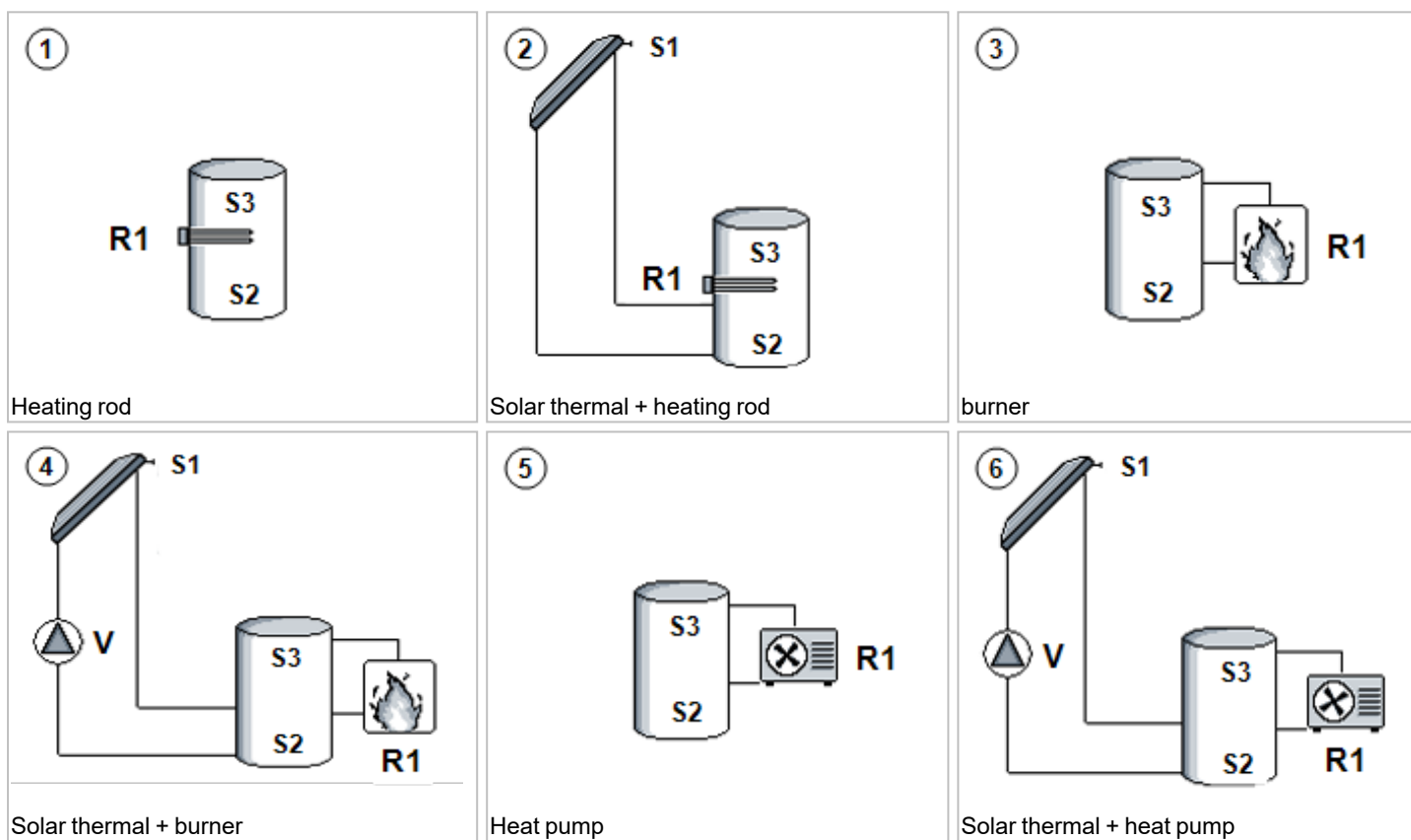
# Scope of Supply

- TDC Smart E
- 3 screws 3.5x35mm and 3 wall plugs S6 for wall mounting
- 4 strain relief clips with 8 screws
- Spare fuse 2A 250V (in the housing cover)
- Installation and operating instruction

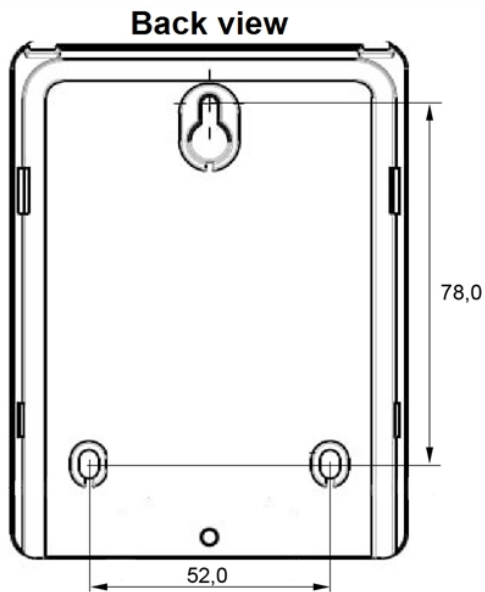
## Hydraulic Variants

 The following illustrations should be regarded only as schematic representations of the respective hydraulic systems and do not claim to be complete. Under no circumstances should the controller replace any safety devices. Depending on the specific application, additional system and safety components such as check valves, non-return valves, safety temperature limiters, scalding protectors, etc., may be required.

 For 3-way valves, the flow direction in energized state (relay active) is shown in the used hydraulic version.





## Wall Installation





1. Unscrew cover screw completely. Carefully remove the terminal compartment cover from the device
2. Mark a hole at the desired position for the upper suspension of the device. When positioning, ensure that the wall surface is as flat as possible so that the housing does not warp when screwed on.
3. Drill the hole for the suspension using a drill and a 6 mm drill bit. Push in the dowel and screw in the screw until the device can be suspended.
4. Attach and align the device. Then mark the two lower fixing holes.
5. Unhook the device again and drill the marked holes using a 6 mm drill bit and press in the dowels.
6. Reattach the device and insert the two screws (6 mm) into the lower mounting holes and tighten them.
7. After installation, replace the terminal compartment cover and tighten it hand-tight using the screw.


## Electrical Connection

 Before working on the unit, switch off the power supply and secure it against being switched on again! Check that there is no power flowing! Electrical connections may only be made by a specialist and in compliance with the applicable regulations. The unit may not be put into operation if there is visible damage to the housing, e.g. cracks.

 The unit may not be accessible from behind.


 Low-voltage cables, such as temperature sensor cables, must be laid separately from mains voltage-carrying cables. Feed temperature sensor cables only into the left-hand side of the unit, and mains voltage cables only into the right-hand side.


 The customer must provide an all-pole disconnecting device, e.g. an emergency heating switch.

 The cables being connected to the unit must not be stripped by more than 55 mm, and the cable jacket must reach into the housing just to the other side of the strain relief.

# Installing the Temperature Sensors

The controller operates with Pt1000 temperature sensors which are accurate to 1 °C, ensuring optimal control of system functions. The inputs are calibrated once at the factory during manufacture. This adjustment ensures that the operating values remain within the specified limits. To compensate for variations caused by the measurement path to the sensor, it is possible to assign an offset to each sensor.

 If desired, the sensor cables can be extended to a maximum of 30 m using a cable with a cross-section of at least 0.75 mm<sup>2</sup>. Ensure there is no contact resistance! Position the sensor precisely in the area to be measured! Only use immersion, pipe-mounted or flat-mounted sensors suitable for the specific area of application with the appropriate permissible temperature range.

 Low-voltage cables, such as temperature sensor cables, must be laid separately from mains voltage-carrying cables. Feed temperature sensor cables only into the left-hand side of the unit, and mains voltage cables only into the right-hand side.

## Temperature Resistance Table for Pt1000 Sensors

°C	-20	-10	0	10	20	30	40	50	60	70	80	90	100
Ω	922	961	1000	1039	1077	1116	1155	1194	1232	1270	1308	1347	1385

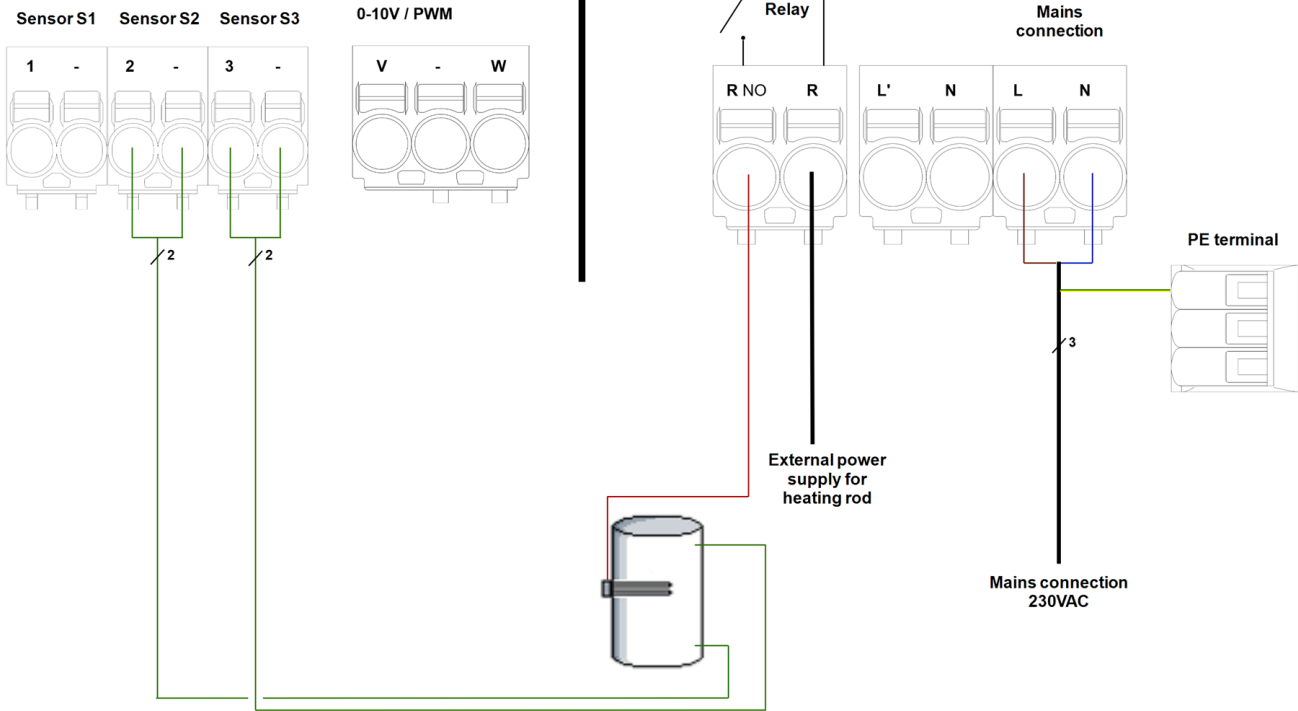
# Electrical Terminals



Low voltages max. 12VDC



Mains voltages 230 VAC 50 - 60 Hz



Clamp	Connection	Clamp	Connection
S1	Unused	R (NO)	Heating rod
-	GND S1	R	Heating rod
S2	Storage sensor bottom	L'	Outer conductor L'
-	GND S2	N	Neutral conductor N'
S3	Storage sensor (top)	L	Outer conductor L
-	GND S3	N	Neutral conductor N
V	Signal unused		
-	GND unused		The PE protective conductor must be connected to the PE metal terminal block!
W	Unused		



## "Connection of PWM pumps"

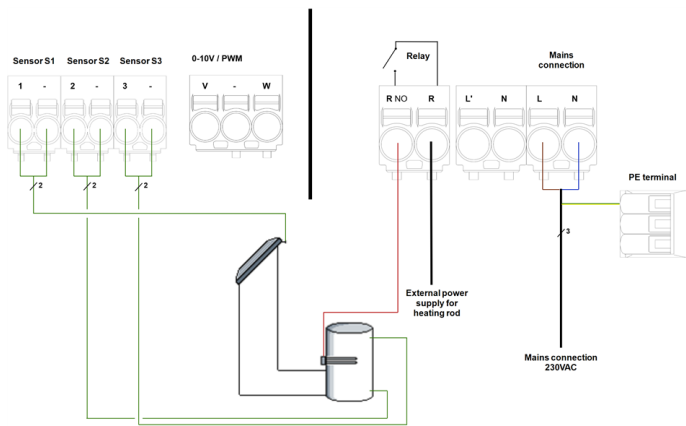
PWM pumps are connected to the controller with 2 wires **1**) PWM Input (default: brown) **2**) GND (default: blue). Some PWM connection cables have 3rd wires (PWM output signal (standard: black)). This is not used for the connection!



The correct terminal assignment for your system or hydraulic diagram can be found in the descriptions in the respective hydraulic diagram, siehe "Hydraulikvarianten" auf Seite 1.



For high-efficiency pumps with 0-10V / PWM signal input, the power can be provided (V1 parallel operation) over a free relay.



### Programme 2 Solarthermie + Heating rod

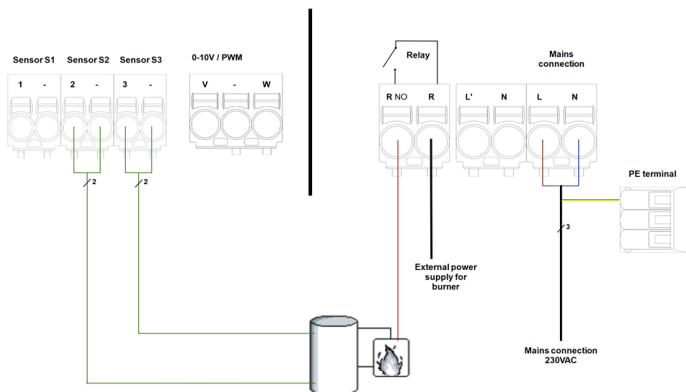


**Low Voltage**  
max. 12VDC



**Mains voltages**  
230VAC 50-60Hz

Terminal:	Connection:	Terminal:	Connection:
S1	Sensor 1 collector	R (NO)	Heating rod
-	GND S1	R	Heating rod
S2	Sensor 2 storage bottom	L'	Outer conductor L'
-	GND S2	N'	Neutral conductor N'
S3	Sensor 3, storage bottom	L	Outer conductor L
-	GND S3	N	Neutral conductor N
The polarity of the sensors S1-S3 is freely selectable.			
V	Signal 0–10 V / PWM		
-	GND V		
W	Unused		



### Programme 3 Burner

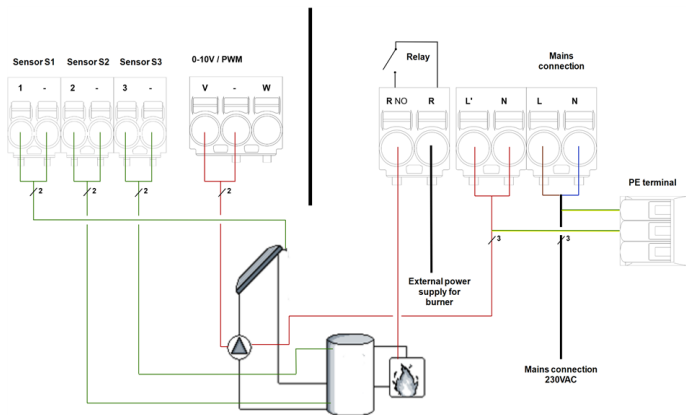


**Low Voltage**  
max. 12VDC



**Mains voltages**  
230VAC 50-60Hz

Terminal:	Connection:	Terminal:	Connection:
S1	Sensor 1 Unused	R (NO)	burner
-	GND S1	R	burner
S2	Sensor 2 storage bottom	L'	Outer conductor L'
-	GND S2	N'	Neutral conductor N'
S3	Sensor 3, storage bottom	L	Outer conductor L
-	GND S3	N	Neutral conductor N
The polarity of the sensors S1-S3 is freely selectable.			
V	0-10V/ PWM		
-	GND V1		
W	Unused		



### Programme 4 Solar thermal + Burner

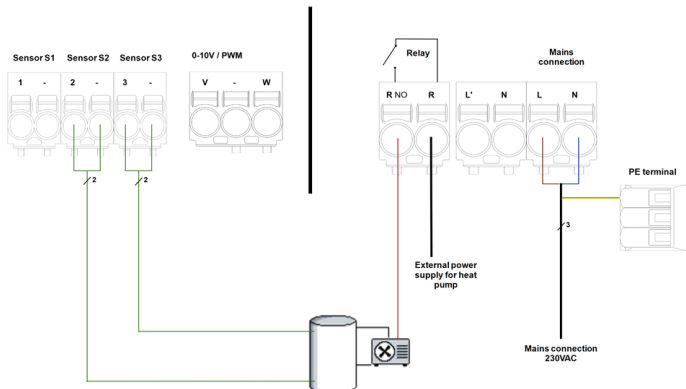


**Low Voltage**  
max. 12VDC



**Mains voltages**  
230VAC 50-60Hz

Terminal:	Connection:	Terminal:	Connection:
S1	Sensor 1 collector	R (NO)	burner
-	GND S1	R	burner
S2	Sensor 2 storage bottom	L'	Outer conductor L'
-	GND S2	N'	Neutral conductor N'
S3	Sensor 3, storage bottom	L	Outer conductor L
-	GND S3	N	Neutral conductor N
The polarity of the sensors S1-S3 is freely selectable.			
V	Signal collector pump		
-	GND collector pump		
W	Unused		



### Programme 5 Heat Pump

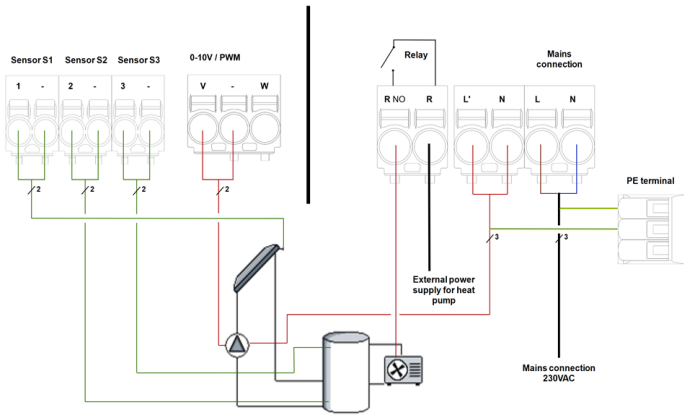


**Low Voltage**  
max. 12VDC





**Mains voltages**  
230VAC 50-60Hz

Terminal:	Connection:	Terminal:	Connection:
S1	Sensor 1 Unused	R (NO)	Heat pump
-	GND S1	R	Heat pump
S2	Sensor 2 storage bottom	L'	Outer conductor L'
-	GND S2	N'	Neutral conductor N'
S3	Sensor 3, storage bottom	L	Outer conductor L
-	GND S3	N	Neutral conductor N
The polarity of the sensors S1-S3 is freely selectable.			
V	Signal 0–10 V / PWM		

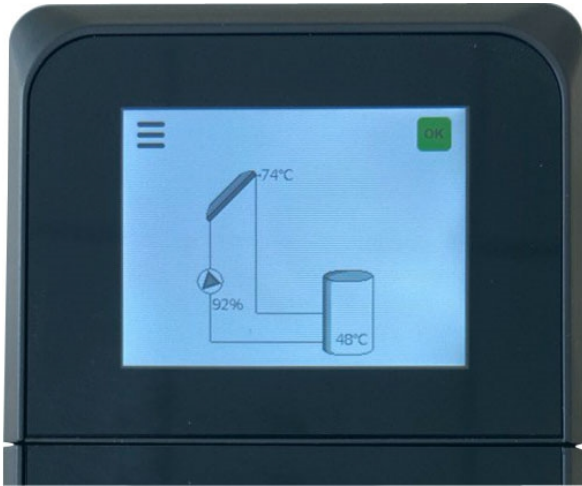


-	GND V		
W	Unused		

### Programme 6 Solar thermal + heat pumps

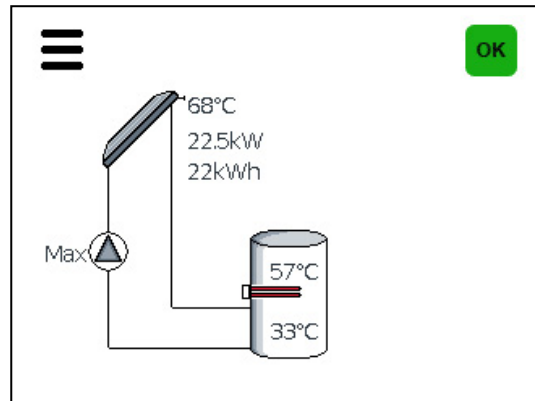
 <b>Low Voltage</b> max. 12VDC		 <b>Mains voltages</b> 230VAC 50-60Hz	
Terminal:	Connection:	Terminal:	Connection:
S1	Sensor 1 collector	R (NO)	Heat pump
-	GND S1	R	Heat pump
S2	Sensor 2 storage bottom	L'	Outer conductor L'
-	GND S2	N'	Neutral conductor N'
S3	Sensor 3, storage bottom	L	Outer conductor L
-	GND S3	N	Neutral conductor N
The polarity of the sensors S1-S3 is freely selectable.			
V	Signal collector pump		
-	GND collector pump		
W	Unused		

## Display and Input



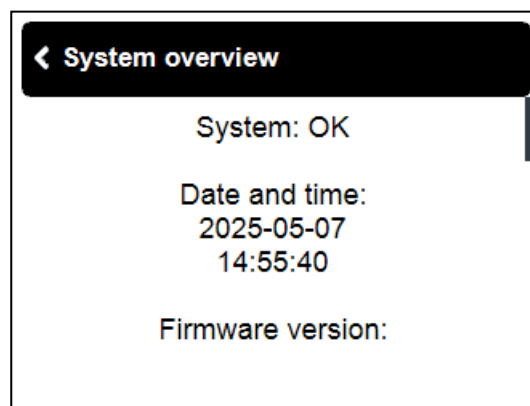
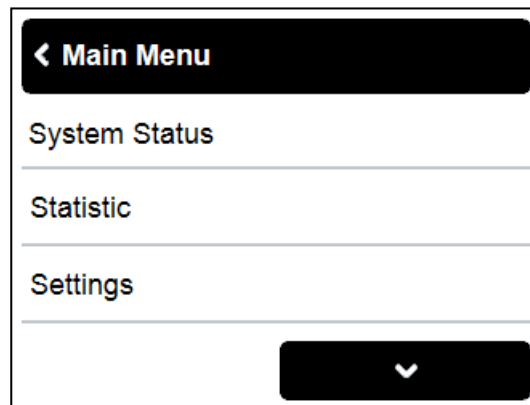
The TFT colour display with extensive text and graphics mode makes the controller easy to operate.

Input is made via the buttons or icons on the touch display, which are assigned different functions depending on the situation. Use the back button (<) at the top left to return to the previous menu level. If applicable, a request for confirmation appears to save the made changes.



Graphic mode appears if no button is pressed for 2 minutes or if the main menu is exited via the Back button.

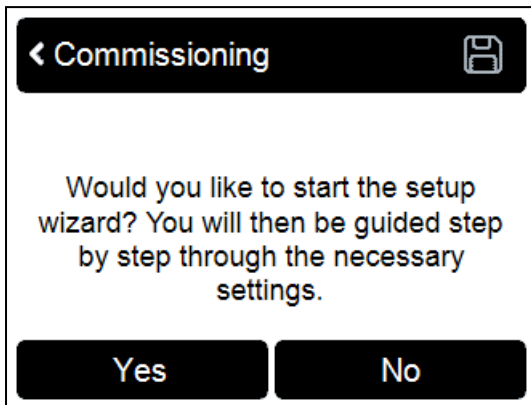
	Pump (rotates during operation)
	Valve (flow direction black)
	Shutoff valve
	Collector
	Storage
	Solid fuel boiler
	Pool
	Thermostat
	Temperature Sensors
	Heat exchanger
	System status OK
	System status info
	System status error message



The system overview with all sensor values and device details can be found in the main menu under System status. Use the 'Back' button at the top left to return to the previous view.

# Commissioning help

When the device is switched on for the first time or after loading the factory settings, the commissioning wizard appears. It guides you through the necessary basic settings in the correct order, with the respective parameters being briefly explained on the display.



1. Set language and time
2. Commissioning help / setup wizard
  - a) agree / disagree or
  - b) skip.

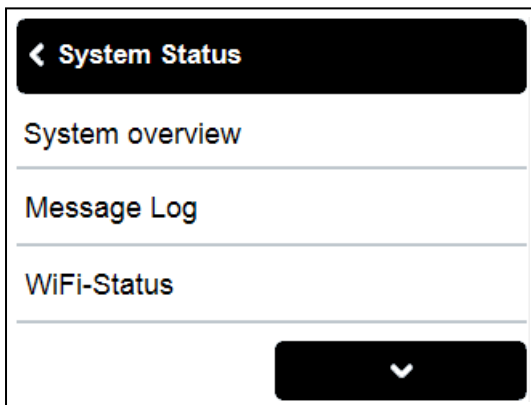
The setup wizard guides through the necessary basic settings in the correct order. Every parameter is explained on the display of the controller. The back button at the top left takes you back to the previous screen.

b) With free commissioning the settings should be made in the following order:

- Settings, all values
- Protection Functions (if any adjustments necessary).
- Special Functions (if any adjustments necessary).

3. in the Manual operation menu, test the switching outputs with a connected load and check the sensor values for plausibility.

## System Status



The menu contains the system overview, messages, the WiFi and MQTT status and the support release.

## System overview

Display of the system status, firmware version, assignment of the inputs and outputs and the heat quantity.

## Message Log

Display of the error memory and informative messages.

## WiFi-Status

Information on the WiFi status and IP address.

## MQTT status

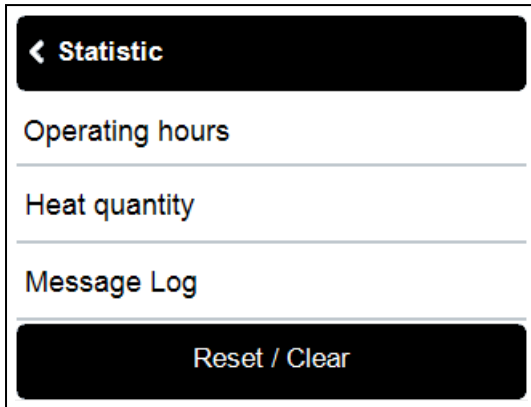
Information on the MQTT status.

## Support authorization

Provides an easy way to authorise manufacturer support to access the controller remotely. The manufacturer support is added to the 'Manage access' list and receives the device address by e-mail.

Additional authorised users can be added or edited at any time via "Settings > Network > WiFi > Manage access".

## Statistic



The menu contains information on the operating hours, the amount of heat, current messages and the option to reset the saved data.

### Operating hours

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Display of operating hours of the consumers connected to the controller, e.g. solar pumps or valves. Different time ranges (day-years) are available.

### Heat quantity

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Display of thermal energy in kWh.



### Message Log

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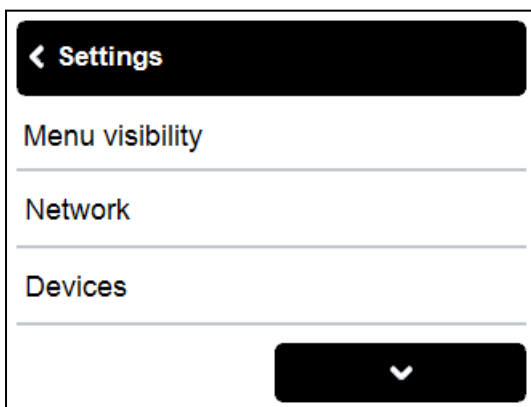
Display of the error memory and informative messages.

### Reset / Delete

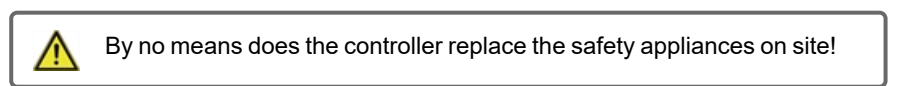
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Reset the saved data. Selecting ,all statistics' clears everything except the messages.

## Settings



The basic settings required for the control function are made.



# Menu visibility

The mode selected under “Menu Visibility” determines the visibility of the menu items and, consequently, access to them.

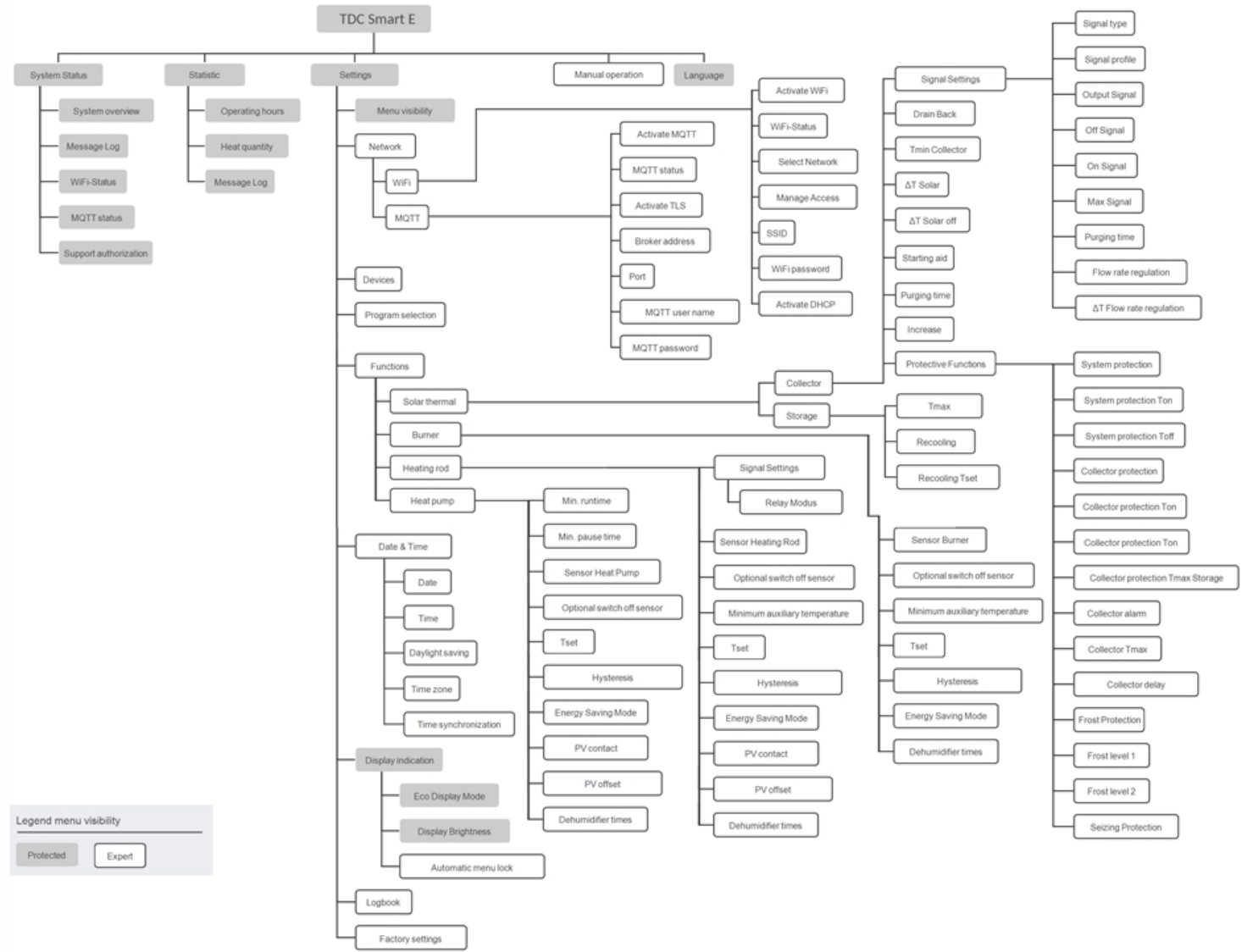
## Modes:

**Protected:** Limited view; only basic functions and access to “System Status” and “Analysis”.

**Expert:** All menu items required for commissioning are visible.

**Manufacturer:** Password-protected area with advanced settings and analysis features.

During initial startup (when the 230-V power supply is turned on), the controller starts in “Expert” mode and automatically switches to “Protected” mode after 60 minutes to prevent unauthorized changes. You can switch from “Protected” to ‘Expert’ at any time; this can be done without a password by selecting the option and confirming it by clicking the “Save” icon.



# Network

---

Settings for the WiFi and MQTT are made here.

## WiFi

### Activate WiFi

Activate WiFi to enable internet functions such as app access, firmware updates or automatic time synchronisation.

### WiFi-Status

Information on the WiFi status and IP address.

### Select Network

Scan for available networks and select the network.

### Manage Access

Store up to 5 email addresses that are permitted to access the controller via the SOREL Connect app.

### SSID

Manual entry of the SSID

### WiFi password

Entering the WiFi password

### Activate DHCP

When Auto-configuration is enabled, the device searches the network for a DHCP server that assigns it an IP address, subnet mask, gateway IP, and DNS server IP. If you deactivate the auto configuration (DHCP), you will have to make the required network settings manually!

## MQTT

### Activate MQTT

Enable sending data using the MQTT protocol.

### Activate TLS

Activate encryption via TLS.

### Broker address

Enter the broker address (target address) for data communication via MQTT. This is set to mqtt.sorel.de by default, but can be adjusted for other applications, such as connection to smart home systems.

### Port

Enter the port. Factory settings 8883

### MQTT user name

Enter the MQTT user name. Is assigned ex works and corresponds to the device address in WiFi status.

### MQTT password

Enter the MQTT password. Awarded ex works. If the password is lost, the MQTT connection can be restored by loading the factory settings.

# Devices


---

Display of the devices, their resources and firmware version as well as updating the firmware.

## Program selection

---

The appropriate hydraulic variant for the respective application is selected here, which serves as the basis for later adaptations according to the desired application.

 The program selection normally occurs only once during the first entry into service by a specialist. An incorrect program selection may lead to unpredictable errors.

# Functions

---

## Solar thermal

Controls a solar pump depending on the collector and storage temperature.

### Collector

#### Drain Back

Optimise default settings for a drainback system.

#### Collector sensor

Heat source sensor / heat supplier for solar function.

#### Tmin Collector

Minimum temperature at solar collector for release.

If this value on the specified sensor is exceeded and the other conditions are fulfilled, the controller will turn on the affiliated pump or the valve. If the temperature on the sensor falls 5 °C below this value, the pump or the valve will be turned off again.

#### ΔT Solar

Switch-on temperature difference for solar loading

If the temperature difference ΔT solar between the reference sensors is exceeded and the other conditions are fulfilled, the controller will turn on the pump/valve on the corresponding relay. If the temperature difference falls to ΔT Off, the pump / valve is switched off again.

#### ΔT Solar off

Switch-off temperature for solar loading between the solar collector and storage.

#### Starting aid

For some solar systems, in particular for vacuum tube collectors, the measurement recording on the collector sensors may be too slow or imprecise, because the sensor is often not on the warmest spot. With activated starting aid, the following process takes place: If the temperature at the collector sensor rises by the value specified under 'Increase' within 5 minutes, the solar pump is switched on for the set 'flushing time' so that the medium to be measured is transported to the collector sensor. If there is still no normal switching condition through this, there will be a 5 minute block time for the start wizard function.



This function should only be activated by a technician if problems occur with the measurement recording. Observe in particular the instructions from the collector manufacturer.

## Protective Functions

### **System protection**

#### **Priority protection function**

The system protection should prevent an overheating of the components installed in the system through the forced shut down of the solar circulation pump. If the value "AS Ton" on the collector has been exceeded for 1 Min. the pump will be turned off and not turn on again in order to protect the collector, for example, from steam. The pump will only be switched on again, when the collector temperature falls below "SP Toff".



With the system protection (on), there are increased standstill temperatures in the solar collector and therefore an increased pressure in the system. The operating manuals from the system components must be observed.

#### **System protection Ton**

If the value "SP Ton" is exceeded at the collector, the pump is switched off after 60 seconds and will not be switched on again, in order to protect the collector e.g. from steam hammering.

#### **System protection Toff**

If the collector falls below the 'System protection Taus' value, the pump is switched on again.

### **Collector protection**

#### **Priority protection function**

The collector protection prevents the collector from overheating. A forced switching of the pump makes sure that the collector is cooled through the storage. If the value "KS Ton" is exceeded on the collector, the pump will be turned on in order to cool the collector. The pump is shut down if the value "KS Toff" on the collector is not met or the value "KS Tmax Sp." on the storage is exceeded.



System protection has priority over collector protection! Even if the switch requirements for the collector protection are present, the solar circulation pump is turned off once "AS T on" is reached. Normally the values from the system protection (depending

on the maximum temperature of the storage or other components) are higher than the collector protection.

### Collector alarm

If this temperature at the collector sensor is exceeded when the solar pump is turned on, a warning or error notification is triggered.

### Frost Protection

A 2-level frost protection function can be activated. In level 1, the controller turns on the pump every hour for 1 minute if the collector temperature is below the set value "Frost Level 1". If the collector temperature continues to decrease to the set value "Frost Level 2", the controller will turn on the pump without disruption. If the collector temperature exceeds the value "Frost level 2" by 2 °C, the pump will turn off again.



Energy is lost through the collector through this function! It is normally not activated for solar systems with antifreeze. The operating manuals from the other system components must be observed.

### Seizing Protection

If the anti-seizing protection is activated, the controller switches the relevant output and the connected consumer daily at 12:00 noon or weekly on Sundays at 12:00 for 5 seconds to prevent seizing of the pump/valve after long periods of inactivity.

## Heat quantity

### Heat metering

Heat metering settings with relative flow rate

### Flow rate Min.

Flow rate of the system at the minimum speed signal.

### Flow rate Max.

Flow rate of the system at maximum speed signal.

### Glycol type

Type of antifreeze

### Glycol percentage

Antifreeze content

### ΔT offset

Correction factor for the temperature difference for heat metering

## Storage

### Seizing Protection

If the anti-seizing protection is activated (daily, weekly, off), the controller switches the outputs on/off at 01:00 noon for 5 seconds to prevent seizing of the pump/valve after long periods of inactivity.

### Solar storage sensor

Heat sink sensor / heat absorber for the solar function.

### Tmax

Maximum temperature in storage to switch off

If this value is exceeded at the specified sensor, the controller turn off the affiliated pump or the valve. If this value on the sensor is below and the other conditions are fulfilled, the controller will turn on the pump or the valve.



Temperature values which are set too high can lead to scalding or damage to the system. Scalding protection must be provided by the customer!

### Recooling

Recooling cools an overheated storage via the collector.



Energy is lost through the collector through this function! The recooling should only be activated in cases of exception, with low heat acceptance, for example, during vacation.

### Recooling Tset

If this value is exceeded, recooling is activated.

## Signal Settings

### Signal type

Menu item appears if a signal output has been selected as the output.

Selection (0 - 10 V, PWM) of the control

0 - 10V = voltage signal

PWM = square wave signal

### **Signal profile**

Select signal profile (manual, valve, solar, heating)

### **Output Signal**

Inverted: small signal = pump running at high power

Normal: small signal = pump runs at low power

### **Off Signal**

Signal to switch off the target device

### **On Signal**

Signal to switch on the target device at minimum power

### **Max Signal**

Signal to set target device to maximum power.

### **Purging time**

For this time, the pump runs with its full speed (100%) in order to guarantee a secure start-up. Only after expiration of this purging time will the pump have a controlled speed and will switch, depending on the set variant, to the max. or min. speed. Speed.

### **Modulation**

Modulation (slow, medium, fast, off) of the output for flow rate regulation.

### **$\Delta T$ Flow rate regulation**

Setpoint difference for flow rate regulation

## **Burner**

### **Sensor Burner**

Selection of the sensor for the burner switch-on condition.

### **Optional switch off sensor**

Selection of the optional sensor for the burner switch-off condition.

### **Minimum auxiliary temperature**

The minimum temperature in the storage at which the auxiliary heating may come on.

### **Tset**

Minimum setpoint temperature for switching on the burner.

### **Hysteresis**

If the temperature exceeds or falls below the setpoint + hysteresis, the burner is switched on.

### **Energy Saving Mode**

Enables Eco mode when solar loading is active.

### **Dehumidifier times**

Enable time for the burner function

Set the desired time periods here during which the burner function is enabled. Five times can be entered per weekday, and individual days can also be copied to other days. Outside the set times, the burner function is switched off.

## Heating rod

### Signal Settings

#### **Relay Modus**

Selection of the relay mode:

Normally open contact = Normal (NO)

Normally closed contact = Inverted (NC)

### Sensor Heating Rod

Selecting the sensor for the heating rod's switch-on condition.

### Optional switch off sensor

Selection of the optional sensor for the heating rod switch-off condition.

### Minimum auxiliary temperature

The minimum temperature in the storage at which the auxiliary heating may come on.

### Tset

Minimum setpoint temperature for switching on the heating rod.

### Hysteresis

If the temperature exceeds or falls below the setpoint + hysteresis, the heating rod is switched on.

### Energy Saving Mode

Enables Eco mode when solar loading is active.

### PV contact

Selecting the sensor for the PV contact.

### PV offset

When the PV contact is closed, the setpoint is increased by this value.

### Dehumidifier times

Enable time for the heating rod function

Set the desired time periods here during which the heating rod function is enabled. Five times can be entered per weekday, and individual days can also be copied to other days. Outside the set times, the heating rod function is switched off.

### Heat quantity

#### **Heat metering**

Heat metering settings with relative flow rate

#### **Flow**

#### **Flow temperature sensor**

Selecting the flow temperature sensor.

## Heat pump

### Min. runtime

The heat pump will run for at least this long after it is switched on before it can be switched off again.

### Min. pause time

Once the heat pump has been switched off, it must remain off for at least this period of time before it can be switched on again.

### Sensor Heat Pump

Selecting the sensor for the heat pump's switch-on condition.

### Optional switch off sensor

Selection of the optional sensor for the heating pump switch-off condition.

### Tset

Minimum setpoint temperature for switching on the heat pump.

### Hysteresis

If the temperature exceeds or falls below the setpoint + hysteresis, the heat pump is switched on.

## Energy Saving Mode

Enables Eco mode when solar loading is active.

## PV contact

Selecting the sensor for the PV contact.

## PV offset

When the PV contact is closed, the setpoint is increased by this value.

## Dehumidifier times

Enable time for the heat pump function

Set the desired time periods during which the heat pump function is enabled here. Five times can be entered per weekday, and individual days can also be copied to other days. Outside the set times, the heat pump function is switched off.

# Date & Time

---

The date and time are synchronised with the online time server. If the internet connection is deactivated, the date and time can be reset in this menu.

## Date

The current date is set here.

## Time

The current time is set here.

## Daylight saving time

If this function is activated, the controller automatically changes to winter time or summer time (DST, Daylight Savings Time).

## Time zone

Setting the time difference to coordinated universal time

## Time synchronization

Setting the Internet time server synchronisation

# Display indication

---

## Eco Display Mode

In eco display mode, the display backlight is switched off after a period of inactivity.



If a message exists, the backlight does not switch off until the message has been scanned by the user.

## Display Brightness

Setting the screen brightness (brightness levels 1 - 5)

## Automatic menu lock

Specifies whether the menu lock automatically switches to Simple mode after one hour.

# Logbook

---

List of the last changes to the setting values.

# Factory settings

---


All settings can be reset, returning the controller to its delivery state.



All of the controller's parametrization, statistics, etc. will be lost irrevocably. The controller must then be commissioned once again.

## Manual operation

The individual relay outputs, v outputs and the connected consumers can be checked for proper functioning and correct assignment.

 Manual operation should only be used by a specialist for short-term function tests, e.g. during commissioning! How manual operation works: The relays and thus the connected consumers are switched on or off by pressing the output symbol, regardless of the current temperatures and the set parameters. At the same time, the current measurement values of temperature sensors are also shown in the display for the purposes of function control.

## Language




The screenshot shows a menu titled "Language" with a back arrow on the left. It lists three options: "Deutsch" (with a checkmark), "English", and "Italiano". At the bottom right, there is a black button with a white downward-pointing chevron.

To select the menu language. During initial commissioning and longer power interruptions, the query is made automatically.

## WLAN and Internet

WLAN requirements:

- The router must support a sufficient number of simultaneous connections (recommended: at least 16)
- Router without activated MAC filtering
- 2,4 GHz WLAN
- WPA2 / WPA3 encrypted WLAN
- SSID Length between 1 and 32 characters
- WLAN password length max. 64 characters
- No automatic forwarding to a login page when dialling into the WLAN (captive portal)
- No guest network if the communication of several SOREL devices via WiFi is desired, as the mutual visibility of participants must be ensured in the WLAN
- Further functional restrictions must be prevented by suitable network configuration by the network administrator

Problem	Possible cause	Support
	WLAN uses invalid frequency band	<ul style="list-style-type: none"> <li>• Activate the 2.4 GHz frequency band on the router and any integrated repeaters and access points</li> </ul>
	Use of a WLAN with communication restrictions (e.g. guest)	<ul style="list-style-type: none"> <li>• Selection of another WLAN without communication restrictions</li> <li>• Relaxation of the communication restrictions on the router</li> </ul>
	WLAN SSID (network name) not system-compliant (e.g. too long or with special characters)	<ul style="list-style-type: none"> <li>• Rename the SSID on the router according to the WLAN requirements (siehe Anforderungen oben)</li> </ul>
	WLAN password not system-compliant (e.g. too long or with special characters)	<ul style="list-style-type: none"> <li>• Rename the WLAN password on the router according to the WLAN requirements (siehe Anforderungen oben)</li> </ul>
	WLAN not WPA2/WPA3-encrypted	<ul style="list-style-type: none"> <li>• Activate WPA2/WPA3 encryption on the router or replace router if not WPA2/WPA3-capable</li> </ul>
 <p><b>Connection problems between TDC Smart E and router (WLAN)</b></p>	Repeater uses a different SSID (network name) than the router	<ul style="list-style-type: none"> <li>• Set the repeater to use the same SSID as the router</li> </ul>
	Disabled DHCP prevents the IP address assigned by the router from being received	<ul style="list-style-type: none"> <li>• In the “Settings &gt; Network &gt; WiFi &gt; Enable DHCP” menu, set to ‘Yes’</li> </ul>
	TDC Smart E is out of range of the router	<ul style="list-style-type: none"> <li>• Check the signal strength of the WLAN on the TDC Smart E. TDC Smart E displays up to 3 bars under “Settings &gt; Network &gt; WiFi &gt; Select network”. Alternatively, the signal strength can be measured using suitable apps on the TDC Smart E. Improve signal strength by changing the position and orientation of the router or TDC Smart E.</li> <li>• Use repeater</li> </ul> <div style="border: 1px solid gray; padding: 5px; margin-top: 10px;"> <p>The signal strength should be better than -70db(m). The higher the db(m) value, the worse the signal. Values between -30db(m) and -40db(m) are good guidelines for a WLAN, while values from -85db(m) are considered critical. Water-bearing objects, metal objects, walls and ceilings contribute particularly strongly to the attenuation of the WiFi signal. Electronic or electrical devices, mirrors and glass surfaces as well as solid pieces of furniture can also have a signal-attenuating effect.</p> </div>



### Internet problems despite connection between TDC Smart E and router (WLAN)

General disruption to the Internet connection of the WLAN

- Ensure internet connection of the WLAN

Important ports are not activated

- Enable the following ports on the firewall or router: Port 5560 (UDP) and 5568 (TCP) for app access Port 21 and 22 (FTP) for firmware updates

MAC address filtering active

- Deactivate MAC address filtering on the router
- Exclude MAC addresses of smart devices from filtering. The MAC address of TDC Smart E is displayed on the WiFi status

WLAN redirects to login page via captive portal

- Use a different WLAN or deactivate forwarding on the router

Your problem still exists? Please contact: [support@sorel.de](mailto:support@sorel.de).

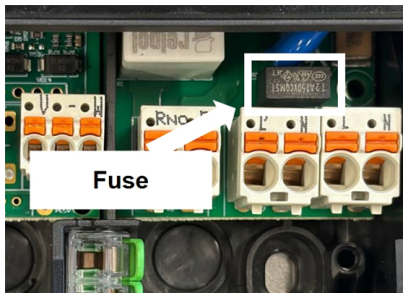
## Replacing the Fuse



Repairs and maintenance may only be performed by a specialist. Before working on the unit, switch off the power supply and secure it against being switched on again! Check that there is no power flowing!



Only use the enclosed spare fuse (in the housing cover) or an identical fuse with the following specifications: 2AT / 250 V. SOREL Art. no.: 09028



If the mains voltage is switched on and the controller still does not function or display anything, then the internal device fuse may be defective. First find the external fault source (e.g. pump), replace it and then check the device fuse.

To change the device fuse, open the device as described under see 'Wall Installation' on page 8, remove the old fuse, check it and, if necessary, replace it with a spare fuse (in the housing cover).

Only then put the controller back into operation and check the function of the switching outputs in manual mode.

## Maintenance



As part of the general annual maintenance of your system, you should also have the functions of the controller checked by a specialist and the settings optimised if necessary.

Performing maintenance:

- Assessment/plausibility check of the analyses (see 'Statistic' on page 15)
- Checking the messages that have occurred (see 'Message Log' on page 26)
- Verification/plausibility check of the current measured values (see 'System Status' on page 14)
- Checking the switching outputs/consumers in manual mode (see 'Manual operation' on page 23)
- Possible optimization of the parameters setting (**only on customers request**)

# Message Log

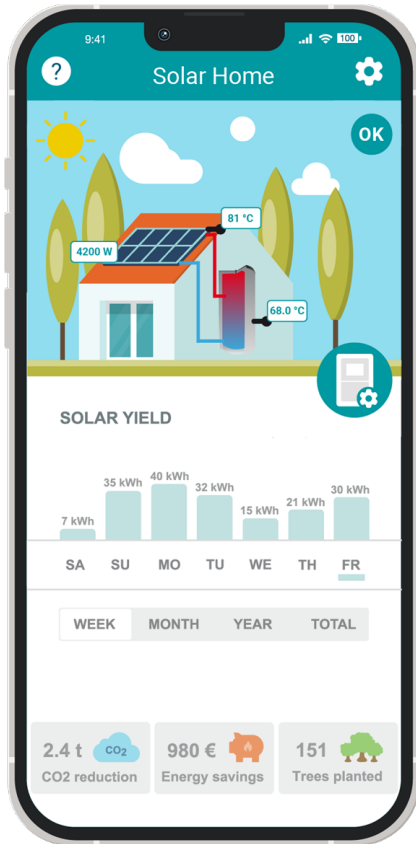
Message	Note for the specialist
Sensor x defective	Means that either the sensor, sensor entrance on the controller or the connecting wire was defective (see 'Temperature Resistance Table for Pt1000 Sensors' on page 9).
Collector alarm	Means that the temperature on the collector set under "Collector protection" was exceeded.
Restart	Means that the controller was restarted, for example, due to a power outage. Check date & time!
No flow	If $\Delta T$ between store and collector is 50 ° C or more for 5 minutes, this message is displayed.
Frequent on / off	A relay was switched on and off more than 5 times within 5 minutes.
System protection	The collector temperature has exceeded the set temperature and the solar pump has been turned off, so that the system does not overheat.
Collector protection	The collector temperature has exceeded the set temperature and the solar pump has been turned on, in order to cool the collector via the storage.
Recooling	The exceeding energy is/was transmitted via the collector to protect the system.
Frost Protection	The solar pump is switched on in order to protect the collector from freezing.

Previous messages can be called up in the "System status > Messages" menu.

# SOREL Connect App

The SOREL Connect app enables visualisation of the system status and remote access to the controller menu.

How to set it up:



1. Download the SOREL Connect app for iOS or Android onto your mobile device.
2. Create account
3. Click on the activation link in your e-mail inbox
4. Connect the controller to the WLAN: "Settings > Network > WiFi > Select network".
5. Enter the selected e-mail address in the access list in the controller: 'Settings > Network > WiFi > Manage access'  
**If this menu item is not displayed, the menu visibility rules must first be expanded under Settings > Menu view, see 'Menu visibility' on page 16.**
6. Log in to app with e-mail and password
7. Check the device address under "System status > WiFi status" and enter it in the SOREL Connect app. Devices in the same WLAN are automatically detected.

# Final Declaration

Although these instructions have been created with the greatest possible care, the possibility of incorrect or incomplete information cannot be excluded. Subject as a basic principle to errors and technical changes.

**Date and time of installation:**

**Name of installation company:**

**Space for notes:**

Your specialised dealer:

Manufacturer:

SOREL GmbH Mikroelektronik  
Reme-Str. 12  
D - 58300 Wetter (Ruhr)

+49 (0)2335 682 77 0  
info@sorel.de  
www.sorel.de

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