

## Solar thermal system with Logamatic SC40

For the Owner

Please read carefully  
before operation.

**Buderus**

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# 1 Safety instructions and explanation of symbols

## 1.1 General safety instructions

### About this manual

This manual contains important information about the safe and correct installation and operation of the solar thermal system.

- Ask your heating engineer to provide you with all the technical documentation relating to the solar thermal system.
- Read this manual carefully and keep it for future reference.
- Always observe the safety instructions to prevent injury and damage to property.

### Intended use

The temperature difference controller (referred to from now on as the "controller") may only be used for operating solar thermal systems under the permissible ambient conditions (0 - 50 °C).

The controller must not be used outdoors, in damp rooms or in rooms where easily flammable gas mixtures could form.

- Only operate the solar thermal system as intended and when the system is in proper working order.
- In the event of danger, disconnect the controller from the mains power supply by means of the isolating device (e.g. mains plug).
- Any work that requires the controller to be opened may only be carried out by a qualified electrician (risk of fatal electric shock).

### Domestic hot water temperature

If the cylinder maximum temperature is set higher than 60 °C, there is a risk of scalding at the hot water points.

- Ask your heating engineer what the maximum hot water temperature has been set to.
- Only draw hot water from mixer units.

### Disposal

- Dispose of packaging in an environmentally responsible manner.
- When replacing components, dispose of the old parts in an environmentally responsible manner.

## 1.2 Symbols



**Safety instructions** in this document are identified by a warning-triangle symbol and are printed on a grey background.

Signal words indicate the seriousness of the hazard in terms of the consequences of not following the safety instructions.

- **Caution** indicates that minor damage to property could result.
- **Warning** indicates that minor personal injury or serious damage to property could result.
- **Danger** indicates that serious personal injury could result. In particularly serious cases, lives could be at risk.



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**Notes** are identified by the symbol shown on the left. They are bordered by horizontal lines above and below the text.

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Notes contain important information in cases where there is no risk of personal injury or damage to property.

## 2 Details of the product

### 2.1 EU Declaration of Conformity

The design and operation of this product conform to the applicable European directives and supplementary national requirements. Conformity has been demonstrated.



### 2.2 Product description

#### Diagram of solar thermal system

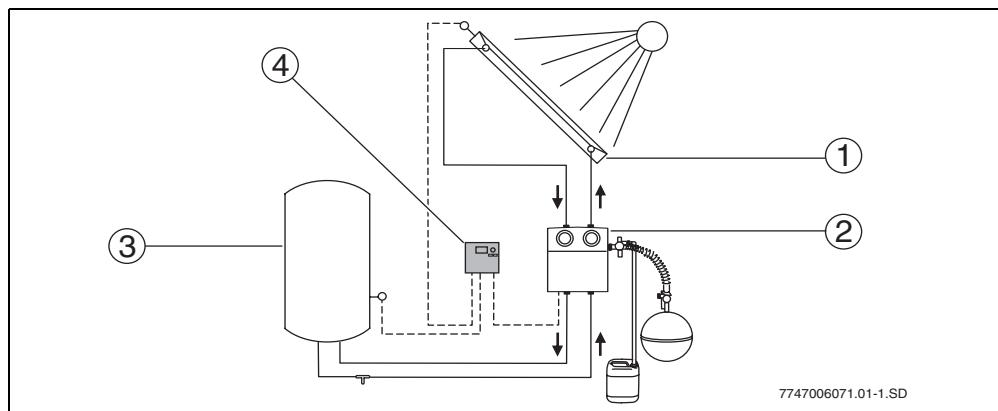


Fig. 1 System diagram

- 1 Collector array
- 2 Solar pumping station
- 3 Solar system cylinder
- 4 Controller SC40

Main components of the solar thermal system	
Collector array	– Consists of flat plate collectors or evacuated tube collectors
Solar pumping station	– Consists of the pump together with safety valves and shut-off valves for the solar thermal circuit
Solar system cylinder	– Used for storing the collected solar energy – There are three different types: <ul style="list-style-type: none"> <li>– Domestic hot water cylinder</li> <li>– Reserve cylinder (for heating boost function)</li> <li>– Combination cylinder (for domestic heating back-up and for domestic hot water)</li> </ul>
Controller SC40	– Includes two temperature sensors

### Operating principle


If the set temperature difference between the collector array (→ Fig. 1, item 1) and the solar cylinder (→ Fig. 1, item 3) is exceeded, the pump in the solar pumping station is switched on.

The pump transports the heat transfer medium (the heat transfer fluid) via the circuit through the collector array to the consumer. This consumer is generally a solar storage cylinder. There is a heat exchanger in the solar storage cylinder. This transfers the heat collected from the sun from the transfer medium to the water intended for domestic use or heating.

If necessary, a hot water mixer unit is fitted to the cylinder to limit the hot water outlet temperature.

### Controller

The controller is designed for use with a solar thermal system. It can be mounted on a wall or is integrated in a solar pumping station.

In normal operating mode, the display screen on the controller stays illuminated in green/yellow for 5 minutes after the last button was pressed (activated by pressing the rotary selector , for example).

The display shows the following:

- Pump status (as a simple system diagram)
- System values (e.g. temperatures)
- Selected functions
- Fault messages

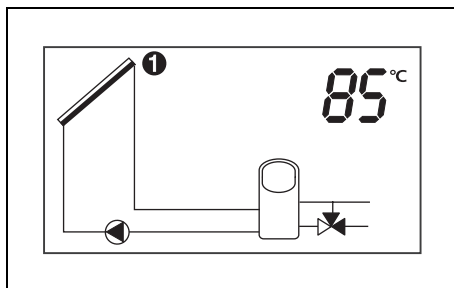


Fig. 2 Possible display indications

### 3 Operation

Your professional heating technician will set the solar thermal system when commissioning it, and it will run automatically.

- Have your heating engineer explain to you how the solar thermal system works, and how to operate it.
- Do not switch off the solar thermal system during long absences (e.g. when going on holiday). When installed according to the manufacturer's specifications, the solar thermal system is intrinsically safe.
- After a power failure or a long absence, check the operating pressure on the pressure gauge of the solar thermal system (→ Section 5.4, page 14).



**Warning:** Risk of damage to system if controller settings are changed.

- Do not make any changes to any settings not described here.

#### 3.1 Elements of the solar pumping station

The main components of the solar pumping station are:

- Thermometers (→ Fig. 3, items 1 and 3): The built-in thermometers display the temperatures of the solar return (blue) and flow (red).
- Pressure gauge (→ Fig. 3, item 2): the pressure gauge indicates the system pressure. The safety valve above it opens and releases the excess fluid pressure via the blow-off pipe if the system pressure rises above 6 bar.

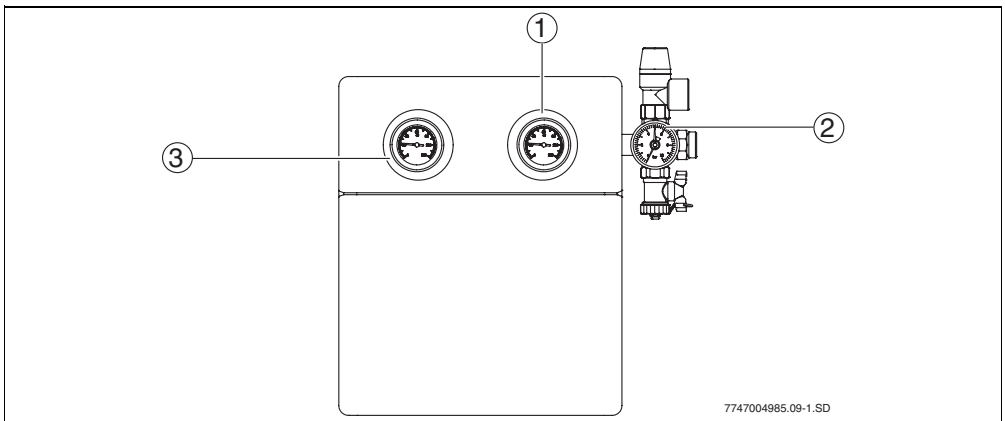


Fig. 3 Solar pumping station

- 1** Display of temperature for solar return
- 2** Pressure gauge and safety valve
- 3** Display of temperature for solar flow

### 3.2 controller controls

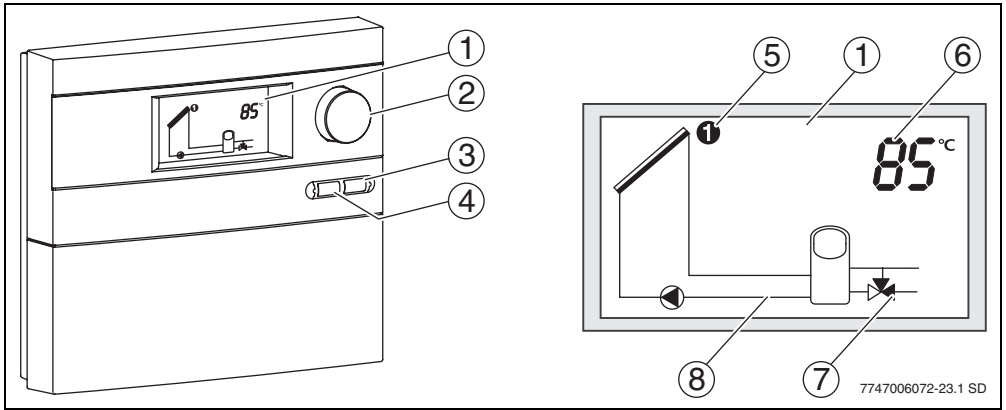


Fig. 4 controller and display

- 1 Display
- 2 Rotary selector
- 3 Back button
- 4 OK button
- 5 Symbol for temperature sensor
- 6 Displays of temperatures, hours of operation, etc.
- 7 Valve symbol (black = open outlet)
- 8 Active circulation diagram


Control	Symbol	Functions
Rotary selector		- Selecting system settings
OK button		- Opening submenus and changing settings (engineers only)
Back button		- Reverting to collector panel temperature display (View level)

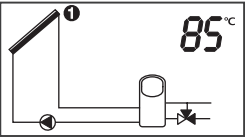
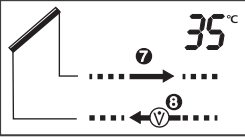
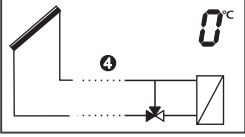
#### Switching off the system

- Disconnect the controller from the mains power supply by means of the isolating device (e.g. mains plug).

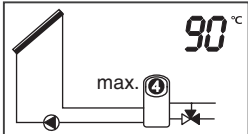
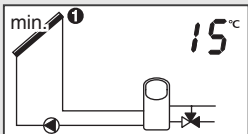
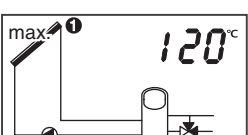


### 3.3 Viewing system data

You can use the rotary selector  to view the following system data if the relevant components are installed and the supplementary functions have been activated by your heating engineer.

Display	Supplementary function	System data
	<b>None</b>	<ul style="list-style-type: none"> <li>- Temperature (°C)</li> <li>- Hours of operation, cumulative (h)</li> <li>- Hours of operation, today (h/d)</li> <li>- Pump speed (%)</li> <li>- Pump and valve status</li> </ul>
	<b>Heat meter</b>	<ul style="list-style-type: none"> <li>- Flow temperature (°C)</li> <li>- Return temperature (°C)</li> <li>- Heat usage, cumulative (kWh)</li> <li>- Heat usage, today (kWh/d)</li> </ul>
	<b>Heat exchanger anti-icing system</b>	<ul style="list-style-type: none"> <li>- Flow temperature (°C)</li> <li>- Hours of operation, cumulative (h)</li> <li>- Hours of operation, today (h/d)</li> </ul>
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Other functions</p> <hr/> <p>Daily heating</p> </div>	<p><b>Activated functions</b></p> <p>Shows other active functions. Possible indications (display flashes when function is active):</p> <ul style="list-style-type: none"> <li>- Double Match Flow</li> <li>- Evacuated tube collector function</li> <li>- S. Europe function</li> <li>- Daily heating</li> <li>- Cooling function</li> </ul>	

Tab. 1 Overview of system data

Status display	
	<p><b>Cylinder maximum temperature</b></p> <p>The cylinder maximum temperature is displayed if the set limit is reached or exceeded.</p>
	<p><b>Collector minimum temperature</b></p> <p>The collector minimum temperature is displayed if the temperature drops below the limit, e.g. 20 °C.</p>
	<p><b>Collector maximum temperature</b></p> <p>The collector maximum temperature is displayed if the set limit, e.g. 120 °C, is exceeded.</p>



Tab. 2 Status indications

## 4 Faults

### 4.1 Faults indicated on the display

When indicating a fault, the display is back-lit in red. In addition, the type of fault is indicated by symbols. The individual fault messages can be retrieved using the rotary selector. Fault messages continue to be displayed until the fault is rectified.

- If a fault occurs, contact a qualified heating engineer.

Indication/Type of fault		
Effect	Possible causes	Remedy
 <b>Sensor failure S1 ... S8</b>		
Associated components (pumps/valves) are switched off.	Temperature sensor not/incorrectly connected.	Contact your heating engineer.
	Temperature sensor or sensor lead defective.	Contact your heating engineer.
 <b>Sensor short circuit S1 ... S8</b>		
Associated components (pumps/valves) are switched off.	Temperature sensor or sensor lead defective.	Contact your heating engineer.
<b>“No fluid flow in solar systems”/“secondary system”</b>		
The temperature difference between collector temperature sensor and bottom cylinder temperature sensor or between heat exchanger flow temperature sensor and bottom cylinder temperature sensor is too great.	Air in the system.	Contact your heating engineer.
	Pump is stalled.	Contact your heating engineer.
	Valves or shut-offs are closed.	Contact your heating engineer.
	Pipe clogged.	Contact your heating engineer.
<b>“Daily heating running time error”</b>		
The daily heating function has not been carried out.	Target temperature not reached.	Contact your heating engineer.
<b>“Collector connections reversed”</b>		
Collector temperature drops 10 K (°C) within 15 seconds of switching on.	Collector connections reversed.	Contact your heating engineer.

Tab. 3 Possible faults indicated on the display

## 4.2 Faults not indicated on the display

Type of fault		
Effect	Possible causes	Remedy
<b>Pump not running even though conditions for switching on are met.</b>		
The solar storage cylinder is not being supplied by the solar thermal system.	No power supply; fuse or power cable faulty.	Contact a qualified electrician.
	Pump switched off in "manual mode".	Contact your heating engineer.
	The temperature at the bottom of the cylinder is close to, or above the set maximum cylinder temperature.	When the temperature drops 3 K (°C) below the maximum cylinder temperature, the pump switches on.
	The collector temperature is close to, or above the set maximum collector temperature.	When the temperature drops 5 K (°C) below the maximum collector temperature, the pump switches on.
	There is no electrical power lead to the pump or it is not connected.	Contact your heating engineer.
	Cooling function active.	–
	The controller checks which cylinder can be charged (only in systems with two cylinders)	–
	Pump is faulty.	Contact your heating engineer.
<b>The system animation on the display is running and the pump is "humming".</b>		
The solar storage cylinder is not being supplied by the solar thermal system.	The pump is stalled.	Contact your heating engineer.
<b>Temperature sensor is displaying an incorrect figure.</b>		
Pump is being activated/deactivated too early / too late.	Temperature sensor not correctly installed. Incorrect temperature sensor installed.	Contact your heating engineer.
<b>Domestic hot water is too hot.</b>		
Risk of scalding	Cylinder maximum temperature and hot water mixer are set too high.	Contact your heating engineer.
<b>Domestic hot water too cold (or hot water flow rate too slow).</b>		
	Domestic hot water thermostat on heating appliance, on heating controller or on mixing valve is set too low.	Contact your heating engineer.

Tab. 4 Possible faults not indicated on the display

## 5 Notes for the user

### 5.1 Why is regular maintenance important?

Your solar domestic hot water system or domestic hot water and central heating booster system is virtually maintenance free.

However, we recommend that you have your system serviced at least every 2 years by your heating engineer. In that way you can ensure smooth and efficient operation and early detection and elimination of any possible damage.

### 5.2 Important notes on heat transfer fluids



**Warning:** Risk of injury from contact with heat transfer fluid (water and propylene glycol mixture).

- If heat transfer fluid comes into contact with eyes: hold eyelids wide open and thoroughly rinse eyes with running water.
- Keep heat transfer fluid out of reach of children.

The heat transfer fluid is biodegradable.

Your engineer has been instructed to ensure, when commissioning the solar thermal system, that the heat transfer fluid provides protection against freezing at temperatures down to at least  $-25\text{ }^{\circ}\text{C}$ .

### 5.3 Checking the solar thermal system

You can contribute to the smooth functioning of your solar thermal system by doing the following:

- Checking the temperature difference between flow and return and between the collector and cylinder twice a year
- Checking the operating pressure for solar pumping stations
- Checking the heat quantity (if a calorimeter has been installed) and/or the operating hours.



Enter the values in the log on page 15 (which may also be copied).

The completed log can help qualified technicians when checking your solar thermal system and performing maintenance.

## 5.4 Checking operating pressure, with possible re-adjustment



Pressure fluctuations in the solar pumping circuit due to temperature changes are normal and do not lead to faults in the solar thermal system.

- Check the system pressure on the pressure gauge (→ Fig. 3) when the system is cold (about 20 °C).

### If pressure drops

A pressure drop can be caused by the following:

- There is a leak in the solar thermal circuit.
- An automatic air vent has expelled air or vapour.

If the pressure of the solar thermal system has dropped:

- Check whether heat transfer fluid has collected in the holding tank under the solar pumping station.
- Call in a qualified heating engineer if the system pressure drops 0.5 bar below the level recorded in the commissioning log (→ Installation and servicing instructions for the solar pumping station).

## 5.5 Cleaning the collectors



**Danger:** Risk of death by falling from roof

- Inspection, maintenance and cleaning work on the roof must only be carried out by qualified technicians.

Due to the self-cleaning effect when rain falls, the collectors do not usually need cleaning.

# 6 User's log

System operator:	Date commissioned:
Number of collectors:	Collector type:
Cylinder type:	Roof pitch:
Direction facing:	Solar pumping station:

Tab. 5

Date	Thermometers on solar pumping station		Temperatures displayed on controller		Pressure gauge on solar pumping station		Operating hours in h and/or heat quantity in kWh	Weather conditions 1=clear sky 2=partly cloudy 3=very cloudy 4=overcast
	Solar flow (red) in °C	Solar return (blue) in °C	Collector (°C)	Tank bottom (°C)	System pressure in bar			

Tab. 6 Log for solar thermal system values (can be copied)



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