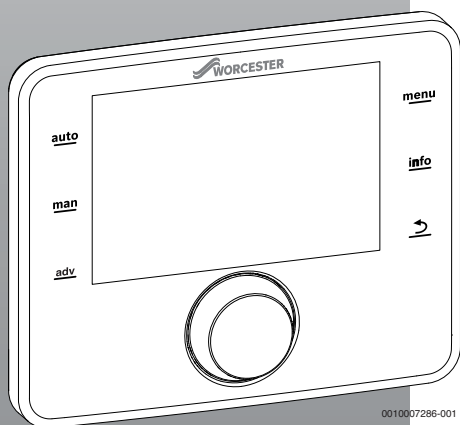


Installation instructions for installers

Solar controller

CS 200



0010007286-001



Table of contents

1 Key to symbols and safety instructions 3

1.1 Explanation of symbols 3

1.2 General safety instructions 3

2 Product Description 4

2.1 Product description 4

2.2 Important information on use 4

2.3 Declaration of Conformity 4

2.4 Scope of delivery 4

2.5 Technical specifications 4

2.6 Temperature sensor characteristics 5

2.7 Additional accessories 5

2.8 Disposal 5

3 Installation 5

3.1 Types of installation 5

3.2 Installation location of the solar controller 5

3.3 Installation in the reference room 5

3.4 Electrical connection 6

3.5 Fitting/Removing the controller 6

4 Basic principles of operation 7

4.1 Overview of the control elements 7

4.2 Overview of the symbols in the display 7

4.3 Operating the service menu 8

4.4 Overview of the service menu 8

5 Commissioning 8

5.1 Overview of the commissioning steps 8

5.2 General commissioning of the solar controller 9

5.3 System commissioning with the configuration wizard 9

5.3.1 Commissioning the solar heating system 9

5.4 Additional settings at commissioning 10

5.5 Performing function tests 10

5.6 Check monitored values 10

5.7 System handover 10

6 Shutdown / switching off 10

7 Service menu 10

7.1 Solar system settings 12

7.2 Diagnosis 12

7.2.1 Function tests 12

7.2.2 Monitored values 12

7.2.3 Fault displays 12

7.2.4 System information 12

7.2.5 Maintenance 12

7.2.6 Reset 13

7.2.7 Calibration 13

8 Thermal disinfection 13

9 Troubleshooting 14

10 Environmental protection and disposal 15


1 Key to symbols and safety instructions


1.1 Explanation of symbols


Warning symbols

Keywords at the start of a warning indicate the type and seriousness of the ensuing risk if measures to prevent the risk are not taken.

The following keywords are defined and can be used in this document:


 **DANGER:**
DANGER indicates a situation that will result in severe injury or death.

 **WARNING:**
WARNING indicates a situation that could result in severe injury or death.

 **CAUTION:**
CAUTION indicates a situation that could result in minor to medium injury.

NOTICE:
NOTICE indicates a situation that could result in damage to property or equipment.

Important information

 The info symbol indicates important information where there is no risk to people or property.

Additional symbols

| Symbol | Meaning |
|--------|---|
| ▶ | a step in an action sequence |
| → | a reference to a related part in the document |
| • | a list entry |
| – | a list entry (second level) |

Table 1

1.2 General safety instructions

These installation instructions are intended for plumbers, heating engineers and electricians.

- ▶ Read the installation instructions (heat sources, modules, etc.) before installation.
- ▶ Observe the safety instructions and warnings.
- ▶ Observe national and regional regulations, technical rules and guidelines.
- ▶ Record all work carried out.

Determined use

- ▶ Only use the product to control solar heating systems in domestic or light commercial applications.

Any other use is considered inappropriate. We take no responsibility for damage caused through incorrect use.

Installation, commissioning and maintenance

Installation, commissioning and maintenance must only be carried out by a competent person.

- ▶ Never install the product in wet rooms.
- ▶ Only use genuine spare parts.

Electrical work

Electrical work must only be carried out by a qualified electrician.

- ▶ Before starting electrical work:
 - Isolate the mains electrical supply and secure against reconnection.
 - Using suitable means, test that the mains voltage is disconnected.
- ▶ Never connect the product to mains voltage.
- ▶ Also observe the connection diagrams of other system components.

Handover to the user

When handing over the solar heating system, instruct the user in its operation and operating conditions.

- ▶ Explain the operation - with particular emphasis on all safety-related actions.
- ▶ Explain that conversions and repairs must only be carried out by a competent person.
- ▶ Point out the need for inspections and maintenance for safe and optimal operation.
- ▶ The installation and operating instructions must be given to the user for safekeeping.

Damage caused by frost

The solar system can freeze if it is switched off:

- ▶ Observe the notices regarding frost protection.

- ▶ Due to the additional functions, e.g. DHW heating or pump anti-seizure protection, the system should always be left on.
- ▶ Correct any faults immediately.

2 Product Description

2.1 Product description

- **The CS 200 must be used in conjunction with the MS 200 to control a Solar heating system, in certain cases an MS 100 may also be combined.**
- After operating for 90 minutes, the solar controller has a power reserve of at least 8 hours. If the power failure lasts longer than the power reserve, the time and date will be deleted. All other settings are saved.
- The functional scope and thus the menu structure of the solar controller are determined by the structure of the system. These instructions describe the maximum functional scope of the equipment. Your attention is drawn to the importance of the system structure in the relevant places. The adjustment ranges and default settings may differ from the information in these instructions.

2.2 Important information on use

CAUTION:

Risk of injury through scalding!

If the DHW temperature is set to > 60 °C, discharging unmixed domestic hot water can lead to serious scalding.

- ▶ Set the temperature for normal operation to < 60 °C.
 - ▶ Do not discharge domestic hot water unmixed.
 - ▶ Install a mixer.
-
- Only products from Worcester may be used within the BUS system.
 - The installation room must be appropriate for IP20 rating.

2.3 Declaration of Conformity

CE The design and operation of this product comply with European Directives and the supplementary national requirements. Conformity has been demonstrated by the CE marking .

You can ask for a copy of the Declaration of Conformity for this product. Please refer to the contact address on the back cover of these instructions.

2.4 Scope of delivery

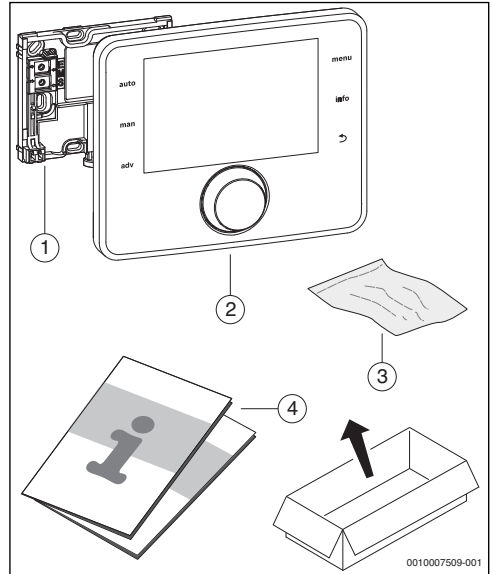


Fig. 1 Scope of delivery

- [1] Wall-mounting plate
- [2] Solar controller
- [3] Installation material
- [4] Technical documentation

2.5 Technical specifications

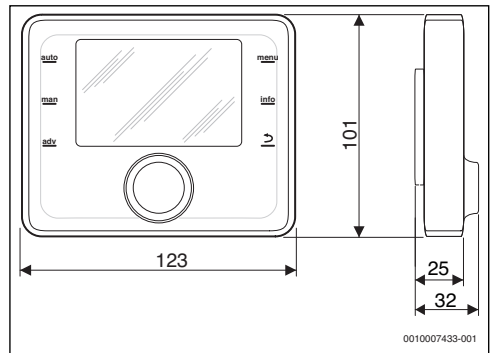


Fig. 2 Dimensions in mm

| | |
|--------------------------|--------------------------------|
| Scope of delivery | → Chapter 2.4, page 4 |
| Dimensions | 150 × 90 × 25 mm (→ Fig. 2) |
| Nominal voltage | 10 - 24 V DC |

| | |
|---|---------------|
| Rated power (excluding illumination) | 9 mA |
| BUS interface | EMS 2 |
| Permitted ambient temp. | 0 °C to 50 °C |
| Protection class | III |
| IP rating | IP20 |

Table 2 Technical specifications

2.6 Temperature sensor characteristics

When measuring temperature sensors, observe the following requirements:

- Isolate the system before measuring.
- Measure the resistance at the cable ends.
- The resistance values represent average values and are subject to tolerances.

| °C | Ω | °C | Ω | °C | Ω |
|-----------|-------|-----------|------|------------|------|
| 20 | 14772 | 50 | 4608 | 80 | 1704 |
| 25 | 12000 | 55 | 3856 | 85 | 1464 |
| 30 | 9786 | 60 | 3243 | 90 | 1262 |
| 35 | 8047 | 65 | 2744 | 95 | 1093 |
| 40 | 6653 | 70 | 2332 | 100 | 950 |
| 45 | 5523 | 75 | 1990 | – | – |

Table 3 Temperature sensor measurements (all temperature sensors in solar system except collector temperature sensors)

| °C | Ω | °C | Ω | °C | Ω | °C | Ω |
|------------|--------|-----------|-------|------------|------|------------|-----|
| -30 | 364900 | 25 | 20000 | 80 | 2492 | 150 | 364 |
| -20 | 198400 | 30 | 16090 | 90 | 1816 | 160 | 290 |
| -10 | 112400 | 35 | 12800 | 95 | 1500 | 170 | 233 |
| 0 | 66050 | 40 | 10610 | 100 | 1344 | 180 | 189 |
| 5 | 50000 | 50 | 7166 | 110 | 1009 | 190 | 155 |
| 10 | 40030 | 60 | 4943 | 120 | 768 | 200 | 127 |
| 15 | 32000 | 70 | 3478 | 130 | 592 | – | – |
| 20 | 25030 | 75 | 2900 | 140 | 461 | – | – |

Table 4 Collector temperature sensor measurements

2.7 Additional accessories

For precise information regarding suitable accessories, refer to the manufacturer's product literature.

Function modules and user interfaces of the control system EMS 2:

- MS 100: Module for solar system
- MS 200: Module for extended solar systems.

2.8 Disposal

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

3 Installation



CAUTION:

Risk of injury through scalding!

If the DHW temperature is set to > 60 °C, discharging unmixed domestic hot water can lead to serious scalding.

- ▶ Set the temperature for normal operation to < 60 °C.
- ▶ Do not discharge domestic hot water unmixed.
- ▶ Install a mixer.



WARNING:

Risk to life from electric shock!

Touching live parts can result in an electric shock.

- ▶ Before installing accessories: Disconnect the power supply to the heat source, building management system and any other BUS nodes (all poles) and secure against unauthorised or accidental reconnection.

3.1 Types of installation

The installation of the solar controller depends on its use and the solar heating system design (→ Chapter 2, page 4).

3.2 Installation location of the solar controller

For direct and easily accessible operation we recommend the installation of the solar controller in the living space.

3.3 Installation in the reference room



The installation surface on the wall must be flat.

- ▶ Install wall-mounting plate (→ Fig. 3).

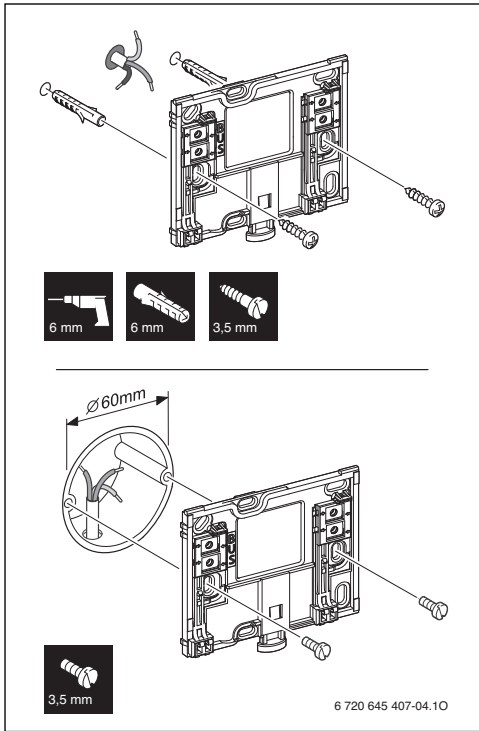


Fig. 3 Installation of wall-mounting plate

BUS BUS interface connection

3.4 Electrical connection

Power is supplied to the solar controller via the BUS cable. The wires are insensitive to polarity.



If the maximum total length of the BUS interfaces between all BUS nodes is exceeded or the BUS system has a ring structure, commissioning of the system is not possible.

Maximum total length of BUS interfaces:

- 100 m at 0.50 mm² conductor cross-section
 - 300 m at 1.50 mm² conductor cross-section.
- ▶ If several BUS nodes are installed, maintain a minimum clearance of 100 mm between the individual BUS nodes.
 - ▶ If several BUS nodes are installed, connect the BUS nodes in series or in a star pattern.

- ▶ To avoid inductive interference: Make sure all low-voltage cables are routed separately from mains voltage cables (min. clearance 100 mm).
- ▶ In the case of external inductive interferences (e.g. from photovoltaic systems), use shielded cables (e.g. LIYCY) and earth the shield on one side. The shield should be connected to the building's earthing system, e.g. to a free earth conductor terminal or water pipes, and not to the grounded terminal in the module.
- ▶ Make a BUS interface to the solar module.

3.5 Fitting/Removing the controller

Fitting the solar controller

- ▶ Hook in the solar controller at the top.
- ▶ Click in the solar controller at the bottom.

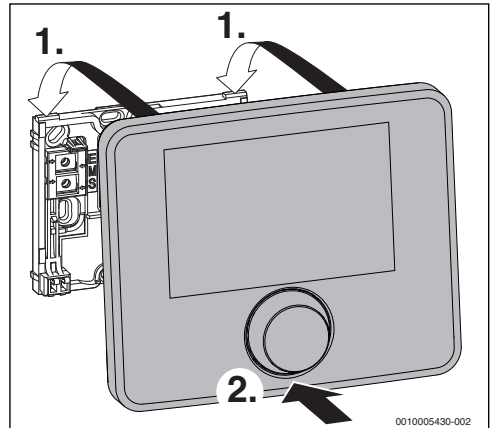


Fig. 4 Fitting the solar controller

Removing the solar controller

- ▶ Press the button on the underside of the mounting plate.
- ▶ Pull the bottom of the solar controller away from the plate.

- Remove the solar controller by lifting upward.

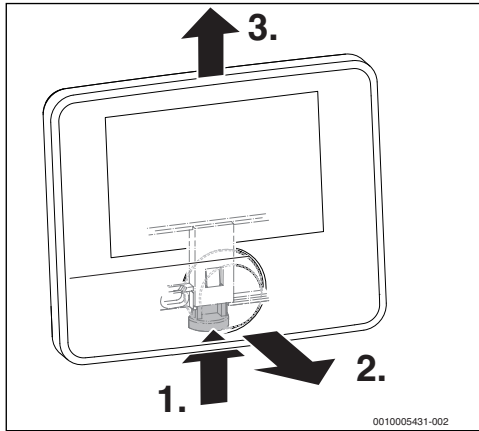


Fig. 5 Removing the solar controller

4 Basic principles of operation

4.1 Overview of the control elements



If the display lighting is dimmed, any button press activates the light. The user then interacts as required. The instructions in this manual assume the display is already lit.

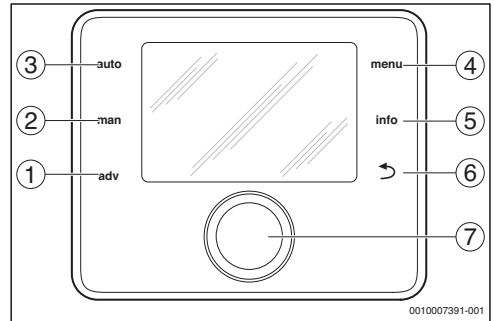


Fig. 6 Control elements

- [1] **fav key** – Lists the favourites
- [2] **man key** – Deactivates the automatic change of the temperature displayed in the standard display
- [3] **auto key** – Activates the automatic change of the temperature displayed in the standard display
- [4] **menu key** – Opens the main menu (hold to open the service menu)
- [5] **info key** – Displays the info menu for information about the current selection
- [6] **Back key** – Returns to previous menu or discards a value (press briefly); returns to the standard display (hold down)
- [7] **Rotary control knob** – Selects (turn) and Confirms (press)

4.2 Overview of the symbols in the display

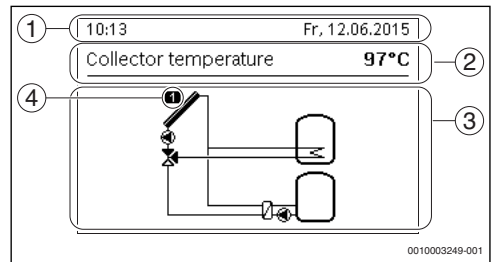


Fig. 7 Examples of symbols in the standard display

- [1] Information line – Time, day of the week and date
- [2] Text information – Temperature sensor description and current, measured temperature
- [3] Graphic illustration of the system
- [4] Number and position of temperature sensors

4.3 Operating the service menu

Closing and opening the service menu

Opening the service menu

- ▶ Hold the menu key until the service menu is displayed.

Closing the service menu

- ▶ If no sub-menu is open, press the Back key to switch to the standard display.
- or-
- ▶ Press and hold the Back key for a few seconds to switch to the standard display.

Navigating through the menu

- ▶ Turn the rotary control knob to highlight a menu or a menu item.
- ▶ Press the rotary control knob. The menu or the menu item is displayed.
- ▶ Press the Back key to return to the previous menu level.

Changing setting values

Selection

- ▶ Turn the rotary control knob to highlight an entry.

Slider

- ▶ Turn the rotary control knob to move the displayed sliding scale and set the value between minimum and maximum.

Selection with slider

- ▶ Turn the rotary control knob to highlight an entry.
- ▶ Press the rotary control knob to confirm the selection. The input field and the slider are enabled.
- ▶ Turn the rotary control knob to set the setting value between minimum and maximum.

Multiple selection

- ▶ Turn the rotary control knob to highlight an entry.
- ▶ Press the rotary control knob to select the entry.
- ▶ Press the rotary control knob again to cancel the selection.
- ▶ Repeat the action steps until the desired entries are selected.

Time program

- ▶ Turn the rotary control knob to highlight a switching time or the corresponding operating mode.
- ▶ Press the rotary control knob to activate the input field for the switching time or the operating mode.
- ▶ Turn the rotary control knob to change the setting value.

Confirming or rejecting the change

Rejecting the change

- ▶ Press the rotary control knob to activate the marked entry or to confirm the change.

- ▶ Turn the rotary control knob to highlight **Continue** and press the rotary control knob. The Display switches to the previous menu level. The solar controller operates with the modified setting.

Rejecting the change

- ▶ Press the Back button.

4.4 Overview of the service menu

These instructions contain an overview of the menu structure. More detailed information about the menu items and their functions can be found in the technical documentation of the installed solar modules (i.e. MS 200).

| Menu and purpose of the menu | Page |
|--|------|
| Commissioning | 8 |
| Start the configuration wizard, check and, if necessary, adjust the most important settings for the system. | |
| Solar settings | 12 |
| Configuring the solar system | |
| Diagnosis | 12 |
| System diagnosis: <ul style="list-style-type: none"> • Perform function test of individual components (e.g. pumps). • Compare the set and actual values. • Display current faults and the fault history. • Display the software versions of all BUS nodes. Additional functions: <ul style="list-style-type: none"> • Enter installer address. • Calibrate the time. | |

Table 5 Overview of the service menu

5 Commissioning



System schematics can be found in the technical documentation of the modules MS 100/MS 200.

5.1 Overview of the commissioning steps

1. Ensure correct installation of Solar heating system (observe instructions for all assemblies and components)
2. Initial charging with fluids and hydrostatic test
3. Electrical wiring
4. Coding of the modules (observe instructions of the modules)

5. Fill and vent the system.
6. Commissioning the CS 200 solar controller
(→ Chapter 5.2, page 9)
7. Commissioning the system with the solar controller
(→ Chapter 5.3, page 9)
8. Check and, if necessary, adjust the settings in the service menu of the CS 200 solar controller and perform configuration (→ Chapter 5.4, page 10)
9. Remedy warning and fault displays, if necessary, and reset fault history
10. System handover to end user (→ Chapter 5.7, page 10).

5.2 General commissioning of the solar controller

Setting the language

- ▶ Turn the rotary control knob to select a language and press the rotary control knob.

Setting the date

- ▶ Turn the rotary control knob to set the day, month and year. **Continue** is highlighted.
- ▶ If the date is set correctly, press the rotary control knob to apply the date.

Setting the time

- ▶ Turn the rotary control knob to set the hours and the minutes. **Continue** is highlighted.
- ▶ If the time is set correctly, press the rotary control knob to apply the time.

System configuration

- ▶ Turn and press the rotary control knob to start (**Yes**) or to skip the configuration wizard (**No**).
- ▶ When the configuration wizard begins, the solar controller automatically recognises which BUS nodes (e.g. modules) are installed in the system (system analysis) and adjusts the menu and the factory defaults to the current system.
- ▶ Perform system commissioning (→ Chapter 5.3).

5.3 System commissioning with the configuration wizard

The solar controller automatically recognises which BUS nodes (e.g. modules) are installed in the system. The configuration wizard adjusts the menu and the factory defaults.

The system analysis may take up to one minute.

After the configuration wizard has performed the system analysis, the **Commissioning** menu is opened. The settings must be checked here and, if necessary, adjusted and finally confirmed.

If the system analysis is skipped, the **Commissioning** menu is opened. The settings listed here must be carefully adjusted

according to the installed system. Finally, the settings must be confirmed.

For further information on the settings refer to the technical documentation of the modules used.

5.3.1 Commissioning the solar heating system

| Menu item | |
|--|---|
| Start configuration wizard? | |
| Question | Answer / setting |
| Check before starting the configuration wizard: | |
| <ul style="list-style-type: none"> • Module installed and address set? • Temperature sensor installed? • System charged and vented? | |
| Start the configuration wizard? | Yes No |
| Operating mode | |
| Question | Answer / setting |
| Which system is installed? Is the coding switch correspondingly set at the solar module? | Solar DHW |
| Extension module | |
| Question | Answer / setting |
| Is an extension module installed? (only required if the use of a MS100 is used in addition to the required MS 200) | No MS 100 |
| Change solar configuration | |
| Question | Answer / setting |
| Is the solar thermal system correctly configured with all functions and additional functions? | Graphic configuration of the solar system |
| Speed ctrl. solar pump | |
| Question | Answer / setting |
| Is a solar pump with speed control installed? | No PWM 0-10 V |
| Speed ctrl solar pump2 | |
| Question | Answer / setting |
| Is a solar pump with speed control installed? | No PWM 0-10 V |
| Gross collector area 1 | |
| Question | Answer / setting |
| How large is the gross collector area? | 0 to 500 m ² |

| Menu item | |
|---|--|
| Type collector array 1 | |
| Question | Answer / setting |
| What type of collectors are installed in the collector array? | Flat-plate collector Vacuum tube collector |
| Gross collector area 2 | |
| Question | Answer / setting |
| How large is the gross collector area? | 0 to 500 m ² |
| Type collector array 2 | |
| Question | Answer / setting |
| What type of collectors are installed in the collector array? | Flat-plate collector Vacuum tube collector |
| Climate zone | |
| Question | Answer / setting |
| Which value corresponds to the climate zone where the solar system is installed? | Search the location of the solar system in the climate zone map (→ Solar module installation instructions) and enter the value of the climate zone. 1... 90 ...255 (90 is default figure) |
| Start solar thermal system | |
| Question | Answer / setting |
| Is the solar system filled and vented? Do you want to start the solar system now? | Yes No |

Table 6 Settings in the Commissioning menu

5.4 Additional settings at commissioning

Some settings are only available if the system is designed and configured accordingly. For more details refer to the MS 100/MS 200 technical documentation.

- ▶ Check the settings in the service menu (→ Chapter 7, page 10 and installation instructions MS 100/MS 200).

5.5 Performing function tests

The function tests can be accessed via the diagnosis menu. The available menu items are strongly dependent on the system installed. Under this menu the following can be tested, for example: **Solar pump: On/Off** (→ Chapter 7.2.1, page 12).

5.6 Check monitored values

The monitored values can be accessed via the **Diagnosis** menu (→ Chapter 7.2.2, page 12).

5.7 System handover

- ▶ Enter the contact details of the responsible installer in the **Diagnosis** menu > **Maintenance** > **Contact address**, e.g. company name, phone number and address or e-mail address (→ Chapter 7.2.5, page 12).
- ▶ Explain to the customer how the solar controller and the accessories work and how to operate them in accordance with best practice.
- ▶ Inform the customer about the selected settings.



We recommend to hand over these installation instructions to the end user.

6 Shutdown / switching off

The solar controller is powered via the BUS interface and is always switched on. The system should only be switched off for maintenance work, for example.

- ▶ Disconnect power from the entire system and all BUS nodes.



After a prolonged power failure or extended period of idleness, the date and time may need to be reset. All other settings are retained permanently.

7 Service menu

The menu of the solar controller is adapted to your system automatically. Some menu items are only available if the system has been set up accordingly and the solar controller has been set correctly. The menu items are only displayed in systems in which the corresponding system components are installed, e.g. two collector arrays. The corresponding menu items and settings can be found in the respective operating instructions.

Information about the operation of the service menu are summarised in Chapter 4, starting on page 7.

Menu: **Service menu**

Commissioning

- Start configuration wizard?
- Operating mode
- Extension module
- Change solar configuration

- Speed ctrl. solar pump...2
- Gross collector area 1 – 2
- Type collector array 1
- Climate zone
- Start solar thermal system
- Max. DHW temp.
- DHW temp.
- Circulation time
- Circulation pulse
- Max. DHW temp.
- Reset elapsed times
- Set temp. Double Match F.
- Glycol content
- Solar DHW
 - Therm.dis./daily ht cyl1 – 3
 - Daily heat start time
 - Daily heat temp.
- Start solar thermal system

Solar settings

- Change solar configuration
- Current solar configuration
- Solar parameters
 - Solar circuit
 - Speed ctrl. solar pump
 - Min. speed sol circ pump
 - Start diff. sol.circ.pump
 - Stop diff. sol.circ.pump
 - Max. collector temp.
 - Min. collector temp.
 - Vac. tube pump anti-seize
 - Southern Europe function (n/a for UK)
 - Start temp. S.Eur. fct. (n/a for UK)
 - Collector cooling function
 - Cylinder
 - Max. temp. cyl. 1
 - Max. pool temp.
 - Priority cylinder
 - Test interval priority cyl.
 - Test duration priority cyl.
 - Runtime valve cyl. 2
 - Start diff. heat ex.
 - Stop diff. heat ex.
 - Frost prot. temp. heat ex.
 - Central heating backup
 - Start diff. ctrl. heat. back.
 - Stop diff. ctrl. heat. back.
 - Max. mixer temp. CH
 - Mixer runtime CH
 - Solar yield/optimisation
 - Gross collector area 1
 - Type collector array 1
 - Climate zone
 - Reset solar yield
 - Reset solar optimisation

DHW settings

- Change DHW configuration
- Current DHW configuration
- DHW parameters
 - Max. DHW temp.
 - DHW
 - Circulation time
 - DHW circ pump op mode
 - Start frequency circ.
 - Circulation pulse
 - Daily heat-up
 - Daily heat-up time
 - Return start temp.
 - Fault display
 - Keep hot

Diagnosis

- Function test
 - Enable function tests
 - Solar
 - ...
- Monitored values
 - Solar
 - ...
- Fault displays
 - ...
- System information
 - ...
- Fault. Press BACK.
 - ...
- Reset
 - ...
- Calibration
 - ...

7.1 Solar system settings

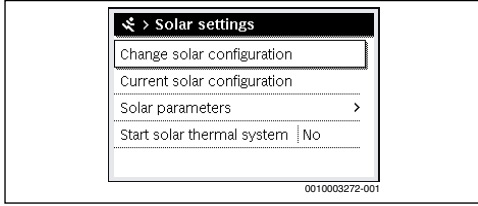


Fig. 8 Solar settings menu

If a solar system with extended functionality is installed, corresponding menus and menu items become active. The menus of the solar system are described in detail in the operating instructions of the module installed (e.g. MS 200).

In the **Solar settings** menu **with all solar systems** the sub-menus listed in Tab. 7 are available.



If the solar collector area is incorrectly set, the solar yield displayed in the info menu is wrong as well.

| Menu item | Purpose of the menu |
|-----------------------------|---|
| Change solar configuration | Graphical configuration of the solar system |
| Current solar configuration | Graphical representation of the configured solar system |
| Solar parameters | Settings for the installed solar system |
| Start solar thermal system | Once all required parameters have been set, the solar system can be started up. |

Table 7 General settings for the solar system

7.2 Diagnosis

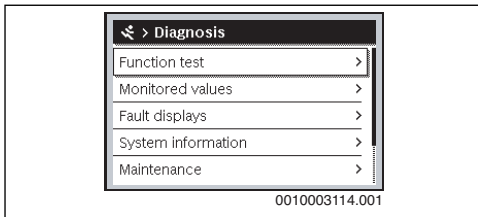


Fig. 9 Diagnosis menu

The **Diagnosis** service menu contains a number of tools for diagnosis. Note that the menu items shown will vary depending on the heating system.

7.2.1 Function tests

This menu can be used to test active system components individually. If **Enable function tests** is set to **Yes** in this menu, the normal heating operation is interrupted in the entire system. All settings are saved. The settings in this menu are only temporary and revert to the respective default settings as soon as the **Enable function tests** is set to **No** or the **Function test** menu is closed. The available functions and the possible settings vary depending on the system installed.

A function test is performed by setting the parameters of the listed component accordingly. You can check whether the mixer, pump or valve responds appropriately by inspecting the behaviour of the corresponding component.

The **solar pump** can be tested, for instance:

- **Off:** The pump stops.
- **On:** The pump starts.

7.2.2 Monitored values

System settings and measurements are displayed in this menu. For example, the system can display whether the maximum collector temperature or the current cylinder temperature has been reached.

You can also call up detailed information on system parts, e.g. the swimming pool. The information and values that are provided depend on the system that has been installed. Observe the technical documentation for modules and other system components.

7.2.3 Fault displays

The current faults and the fault history can be called up in this menu.

| Menu item | Description |
|---------------|--|
| Active faults | All current faults that are present in the system are displayed here according to their severity. |
| Fault history | The last 20 faults are displayed here, sorted in order of the time of occurrence. The fault history can be deleted in the Reset menu (→ Chapter 7.2.6, page 13). |

Table 8 Information in the fault display menu

7.2.4 System information

The software versions of the BUS nodes installed in the system can be called up in this menu.

7.2.5 Maintenance

You can add a contact address in this menu. When the user interface displays a fault code, the added address is also displayed. The end customer can notify the installer to arrange an appointment (→ Chapter 9, page 14).

| Menu item | Description |
|-----------------|---------------------|
| Contact address | → "Contact address" |

Table 9 Settings in the Maintenance menu

Contact address

The contact address is automatically displayed to the end user in case of a fault.

Entering company name and telephone number

The current cursor position will flash (marked by |).



Fig. 10 Entering a contact address

- ▶ Turn the control knob to move the cursor.
- ▶ Press the control knob to activate the input field.
- ▶ Turn the control knob to enter characters.
- ▶ Press the Back key when you have finished making entries.
- ▶ Press the Back key again to return to the next previous menu.

7.2.6 Reset

You can delete different settings or lists or reset them to the default setting in this menu.

| Menu item | Description |
|-----------------|---|
| Fault history | The fault history is deleted. If currently a fault is present, the fault history is recorded again. |
| Default setting | All settings are reset to the corresponding default setting. The system must be recommissioned after this reset! |

Table 10 Resetting the settings

7.2.7 Calibration

| Menu item | Description |
|-----------------|---|
| Time correction | This correction (- 20 ... 0 ... + 20 s) is automatically carried out once a week (0 is default). Example: Deviation of the time by approximately -6 minutes per year <ul style="list-style-type: none"> • -6 minutes per year is equal to -360 seconds per year • 1 year = 52 weeks • -360 seconds: 52 weeks • -6.92 seconds per week • Correction factor = +7 s/week. |

Table 11 Settings in the Calibration menu

8 Thermal disinfection



CAUTION:

Risk of scalding.

During thermal disinfection, discharging unmixed hot water can cause serious scalding.

- ▶ Only use the maximum adjustable hot water temperature for thermal disinfection.
- ▶ Inform occupants of the premises of the risk of scalding.
- ▶ Perform thermal disinfection outside of the normal operating times.
- ▶ Do not discharge DHW unmixed.
- ▶ Ensure a thermal mixing valve is fitted as stated in the UK G3 building regulations.

Perform thermal disinfection/daily heat-up to kill off pathogens (e.g. legionella) on a regular basis.

To guarantee thermal disinfection/daily heat-up:

- ▶ Set the heat source (e.g. boiler) in such a way that daily heat-up can be carried out, for example temperature settings or time programme for DHW heating.
- ▶ Install the pipework for system components, which are necessary for thermal disinfection or daily heat-up, as energy-efficiently as possible (short pipe lengths, good thermal insulation, etc.).

In the case of larger DHW systems, there may be statutory requirements (→ regulations on drinking water) for thermal disinfection. Observe the instructions in the technical documentation of the heat source.

If daily heat-up is activated:

- The entire DHW volume is heated up daily to the temperature that has been set for the daily heat-up. This function is not performed, if the domestic hot water has already reached the set temperature within the last 12 hours due to solar heating.
- The daily heat-up starts automatically at the set time according to the time set in the solar controller.

9 Troubleshooting

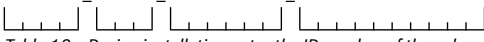


Table 12 During installation enter the ID number of the solar controller here.

A fault in the system is indicated on the display of the solar controller. The cause can be a fault on the solar controller, in a component, in an assembly or on the heat source. The instructions belonging to the affected component or assembly, and especially the service manual with detailed fault descriptions, contain additional information on troubleshooting.

The solar controller saves the last 20 faults (→ fault history, page 12).



Only use original spare parts. Damage resulting from spare parts, which are not supplied by the manufacturer, is excluded from liability.

If a fault cannot be corrected, Worcester's Technical Support department (see back cover).

| Fault code - sub-code - [cause or fault description] | |
|--|--|
| A11 - 1010 - [No communication via BUS interface EMS 2] | |
| Test procedure / Cause | Corrective measure |
| Check whether the BUS cable was connected correctly | Rectify wiring faults and switch controller off and on again |
| Check whether the BUS cable is defective. Remove extension module from EMS-BUS and switch controller off and on again. Check whether the cause of the fault is a module or module wiring | Repair or replace the BUS cable. Replace the defective EMS-BUS node |
| A11 - 1038 - [Invalid time/date] | |
| Test procedure / Cause | Corrective measure |

| Fault code - sub-code - [cause or fault description] | |
|---|------------------------|
| Date/time not yet set | Set date/time |
| Prolonged loss of power supply | Avoid voltage failures |
| A11 - 6004 - [No communication w. solar module] | |
| Test procedure / Cause | Corrective measure |
| Check configuration (set address at the module). The selected setting requires a solar module | Change configuration |
| Check the EMS connecting lead to the solar module for damage. BUS voltage at the solar module must be between 12-15 V DC. | Replace damaged cables |
| Solar module defective | Replace the module |

Table 13 Fault displays with fault code A11

| Fault code - sub-code - [cause or fault description] | |
|---|---|
| A51 - 6021 - [Collector temperature sensor defective] | |
| Test procedure / Cause | Corrective measure |
| Check configuration. The selected setting requires a collector temperature sensor | Change configuration. |
| Check connecting lead between solar module and collector temperature sensor | Establish a sound connection |
| Check collector temperature sensor according to the table (→ Chapter 3, page 5) | If values do not match, replace the sensor |
| Check the voltage at the terminals of the collector temperature sensor on the solar module according to the table | If the sensor values matched, but the voltage values do not match, replace the solar module |

| A51 - 6022 - [Bottom temperature sensor on cylinder 1 defective. Standby mode active] | |
|---|--|
| Test procedure / Cause | Corrective measure |
| Check configuration. The selected setting requires a temperature sensor at the bottom of the cylinder | Change configuration |
| Check connecting lead between solar module and bottom cylinder temperature sensor | Establish a sound connection |
| Check the electrical connection of the connecting lead at the solar module | If a screw or plug is loose, rectify the contact problem |

| Fault code - sub-code - [cause or fault description] | |
|--|---|
| Check the bottom cylinder temperature sensor according to the table (→ Chapter 3, page 5) | If values do not match, replace the sensor |
| Check the voltage at the terminals of the bottom cylinder temperature sensor on the solar module according to the table (→ Technical documentations of the modules MS 100/MS 200). | If the sensor values matched, but the voltage values do not match, replace the module |

Table 14 Fault displays with fault code A51

10 Environmental protection and disposal

Environmental protection is a key commitment of the Bosch Group.

Quality of products, efficiency and environmental protection are equally important objectives for us. Laws and requirements aimed at protecting the environment are strictly observed. In order to protect the environment, we use the best possible technology and materials within the constraints of economic considerations.

Packaging

Where packaging is concerned, we participate in country-specific recycling processes that ensure optimum recycling. All of our packaging materials are environmentally compatible and can be recycled.

Old electrical and electronic appliances



Electrical or electronic devices that are no longer serviceable must be collected separately and sent for environmentally compatible recycling (in accordance with the European Waste Electrical and Electronic Equipment Directive).

To dispose of old electrical or electronic devices, you should use the return and collection systems put in place in the country concerned.

Batteries must not be disposed together with your household waste. Used batteries must be disposed of in local collection systems.

Worcester, Bosch Group
Cotswold Way, Warndon, Worcester WR4 9SW.
Tel. 0330 123 9559
Worcester, Bosch Group is a brand name of
Bosch Thermotechnology Ltd.
worcester-bosch.co.uk

6720830475

WORCESTER, BOSCH GROUP:

TECHNICAL SUPPORT: 0330 123 3366
APPOINTMENTS: 0330 123 9339
SPARES: 0330 123 9779
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