6 720 811 153-00.1O

CRC200
Comfort Room Controller

BOSCH

Installation instructions for contractors

Contents

1 Explanation of symbols and safety instructions

1.1 Guideline to symbols

Warnings

⚠	Warnings in this document are identified by a warning triangle printed against a grey background. 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** indicates a hazardous situation which, if not avoided, will result in death or serious injury.
- **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.
- **CAUTION** indicates a hazardous situation which, if not avoided, could result in minor to moderate injury.
- **NOTICE** is used to address practices not related to personal injury.

Important information

ⓘ	This symbol indicates important information where there is no risk to people or property.

Additional symbols
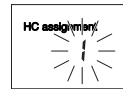
Symbol	Function
▶	Sequence of steps
→	Cross-reference to other points in this document or to other documents
•	Listing/list entry
–	Listing/list entry (2nd level)
☼	Outdoor temperature dependent function
HC assignment	Flashing display (e. g. flashing 1)

Table 1   Additional symbols

1.2 Safety instructions

These installation instructions are intended for competent persons who are skilled in dealing with water installations, heating and electrical systems.

▶ Read the installation instructions (heat sources, modules, etc.) before starting the installation.

▶ Observe safety instructions and warnings.

▶ Observe national and regional regulations, technical rules and guidelines.

▶ Document all work performed.

Designated use

▶ Use the product only to control heating systems in single- or multi-family dwellings.

Any other use is considered improper. Any resulting damage is excluded from the manufacturer's warranty.

Installation, commissioning and maintenance

Installation, commissioning and maintenance may be performed only by a licensed contractor.

▶ Never install the product in wet areas.

▶ Install only genuine spare parts.

Electrical work

Electrical work may be carried out only by qualified electricians.

▶ Before starting electrical work:

– Isolate all poles and secure against unintentional reconnection.
– Ensure the system has been disconnected from the power supply.
▶ Never connect the product to line voltage.
▶ Also observe the connection diagrams for other system components.

Handing over to the operator

Installing contractor - Please train the end user in proper use of this product.

▶ Explain operation – especially all safety-related actions.
▶ Point out that conversion or repair may be carried out only by a licensed contractor.
▶ Provide a copy of these installation and operating instructions to the end user for future reference.

Risk of damage from frost

The system can freeze if it is switched off:

▶ Observe the instructions for frost protection.
▶ Always leave the system switched on for additional functions, e. g. water heating or anti-seize protection.
▶ Immediately correct any faults that occur.

2 Product Description

| i | Functions that are relevant only in conjunction with the outdoor temperature are identified by a corresponding symbol (☼). |

2.1 Product Information

- The user interface is used to control a heating zone and a DHW tank charging circuit for water heating directly at the heat source.
- The user interface incorporates a time program:
  - Preset for the heating zone, but freely adjustable with 6 switching times per day
  - Water heating may be controlled with or without time program.
- The user interface displays information about the heat source and heating system and is used to change the settings.
- Installation options: On the wall with a BUS connection to a heat source or CZM100 module with an EMS-BUS Interface (Energy Management System).
- After operating for 1½ hours, the user interface has a power reserve of at least four hours. If the power failure lasts longer than the power reserve, the time and date will be deleted. All other settings are retained.
- The functional scope and thus the menu structure of the user interface are determined by the structure of the system. Your attention is drawn to the importance of the system structure at the relevant places in these instructions. The control ranges and factory settings may differ from the information in these instructions.

2.1.1 Control types

| i | There are boilers that have integrated outdoor reset controls. In such boilers, the outdoor reset control must be deactivated. |

The following control options are available:

Outdoor reset operation (☼):
- simple outdoor reset control
- optimized outdoor reset control.

This operation requires additional optional outdoor sensor accessory

Room temperature-dependent operations:
- supply temperature control
- power output control

The supply temperature is adjusted using the heating curve in **outdoor reset controls** (☼) (with or without room

temperature influence). Simple and optimized variants are available.

In the **simple outdoor reset control** (⚒) the heating curve is a straight line.

In the **optimized outdoor reset control** (⚒) the heating curve is an actual curve. The relationship between the outdoor temperature and the supply temperature is therefore very precise.

Supply temperature control and output control are available for **room temperature-dependent control**.

With **supply temperature control**, the CRC200 reacts to a difference between the current and the required room temperature by changing the supply temperature. This method of control is suitable for apartments and residential houses.

With **power output control**, which is possible only in systems with one heating zone and no CZM100, the CRC200 reacts to a difference between the current and the required room temperature by changing the heat output of the heat source. There are fewer burner starts and shorter pump runtimes. This saves energy and enhances the boiler's and the pump's lifetime.

2.1.2 Possible applications in different heating systems

Heating system with one CRC200
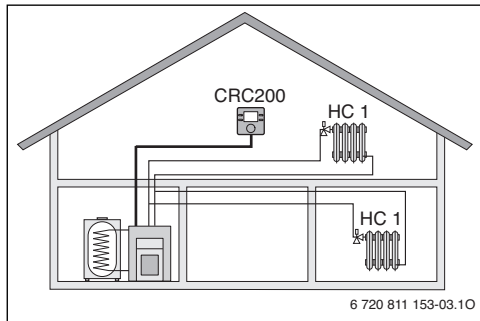

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Fig. 1   Example of a heating system with one heating zone HC 1 and a CRC200 as controller (single-family home)

The CRC200 serves as the controller for heating systems with one heating zone and water heating (→ Fig. 1). The user interface is installed in a suitable living space.

Heating systems with several CRC200
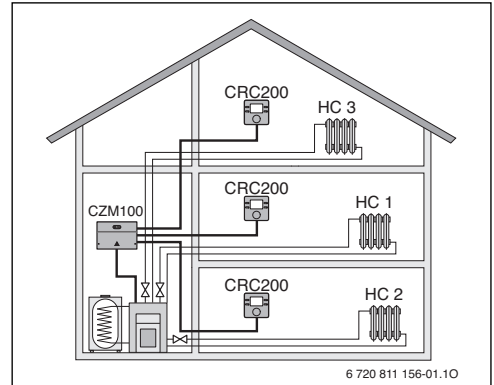

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Fig. 2   Example of a heating system with three heating zones with one CZM100 and one CRC200 per zone as the controller.

Usually, in heating systems with several heating zones, each zone is individually controlled by a CRC200 (→ Fig. 2). In this case, the following applies:

Each CRC200 controls its heating zone independently. In other words, the CRC200 controls the assigned heating zone completely (e. g. HC 3, → Fig. 2) in terms of room temperature, time program, vacation program and immediate tank charging. In addition to the automatic mode, manual operation is also possible.

Central settings are adopted from the CRC200 in the first heating zone. This includes parameterization of water heating and the low loss header / header sensor. This means that water heating settings for the storage tank temperature and thermal disinfection are made in heating zone 1 on the CRC200. On the CRC200 for heating zones 2 … 8, it is possible to set one operating mode for water heating. The heat source selects the highest value from the set point values received. In addition, manual override for tank charging is possible. When the system is operating, all requests from the individual CRC200 are processed, i. e. each request for hot water is implemented. If the vacation program is active in the CRC200 for heating zone 1, only the assigned first heating zone and the hot water set point in the CRC200 for heating zone 1 are affected. Water heating is still based on the set point values in the CRC200 for heating zones 2 … 8. This ensures on-demand heating and availability of hot water for each heating zone based on the settings in each individual CRC200.

2.2   Important instructions for use

> ⚠️ **WARNING:** Risk of scalding!
> ▶ If hot water temperatures are set above 140 ℉ (60 ℃) or thermal disinfection is switched on, a mixer must be installed.

> ⚠️ **NOTICE:** Risk of damage to the floor!
> ▶ Radiant floor heating must be installed only as a heating zone with mixer and an additional temperature switch to protect the floor from overheating, by delivering too hot supply water.

- The user interface may be connected only to heat sources with Bosch EMS-BUS or CZM100 for multi-zone applications.
- This user interface is intended only for wall-mounted installation (→ Chapter 3, starting at page 7).
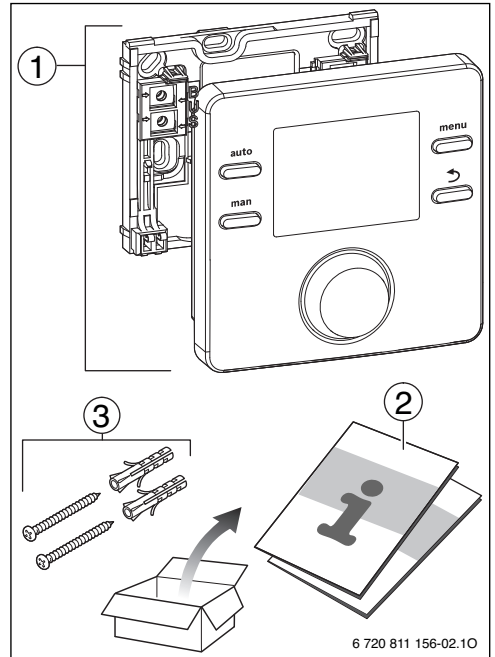
2.3   Scope of delivery

Fig. 3   Scope of delivery

[1]   User interface
[2]   Technical documentation
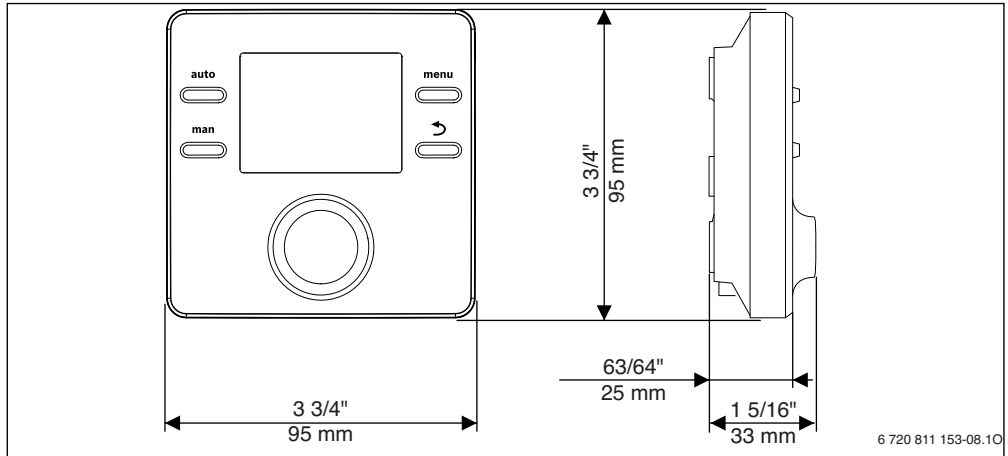[3]   Screws and anchors

2.4 Technical Data

Fig. 4   Dimensions

Dimensions (W × H × D)	3 3/4" × 3 3/4" × 1 5/16" (95 × 95 × 33 mm) (→ Fig. 4)
Rated voltage	8 ... 16 V DC
Nominal current	6 mA
BUS interface	EMS (2-wire BUS)
Control range	41 ... 86 °F (5 ... 30 °C)
Permissible ambient temperature	32 ... 122 °F (0 ... 50 °C)
Protection class	III
Protection	IP20

Table 2   Technical Data

2.5 Accessories

Function modules of the **EMS** control system:
- **CZM100**: Zone module for up to three heating zones
- Outdoor temperature sensor for outdoor reset control types or WWSD (Warm Weather Shut Down) and frost protection.

Only compatible with the following products:
- CRC100 and CZM100

Applicability of these instructions to EMS-capable modules
These instructions also apply to the user interface when used in conjunction with CZM100 (accessory).

2.6 Applicability of the technical documentation

All information related to BUS systems and heating controllers contained in the technical documentation of e.g. heat sources applies also to the present user interface.

3 Installation

The detailed system schematics for mounting the hydraulic assemblies and the associated control devices can be found in the installation manual of CZM100.

> **DANGER:** Risk of electric shock!
> ▶ Before installing this product: Disconnect the heat source and all other BUS users from the line voltage across all poles.

3.1 Installation location

> ℹ This user interface is intended only for wall-mounted installation. Do not install in the heat source.

The room in your home where the controller is installed is the reference room. If room temperature-dependent control is active, the room temperature in this room serves as the reference variable for the entire system. If the outdoor reset control is enabled to factor in the room temperature, the room temperature functions as an additional reference variable.

The control quality depends on the installation location.

- The installation location (= reference room) must be suitable for controlling the zone (→ Fig. 5, Page 8).
- The user interface must be installed on an interior wall.
- Do not place obstructions within 2 1/2' (0.75 m) below CRC200.

> **i** If there is no suitable reference room, we recommend changing the settings to a purely outdoor temperature dependent control.
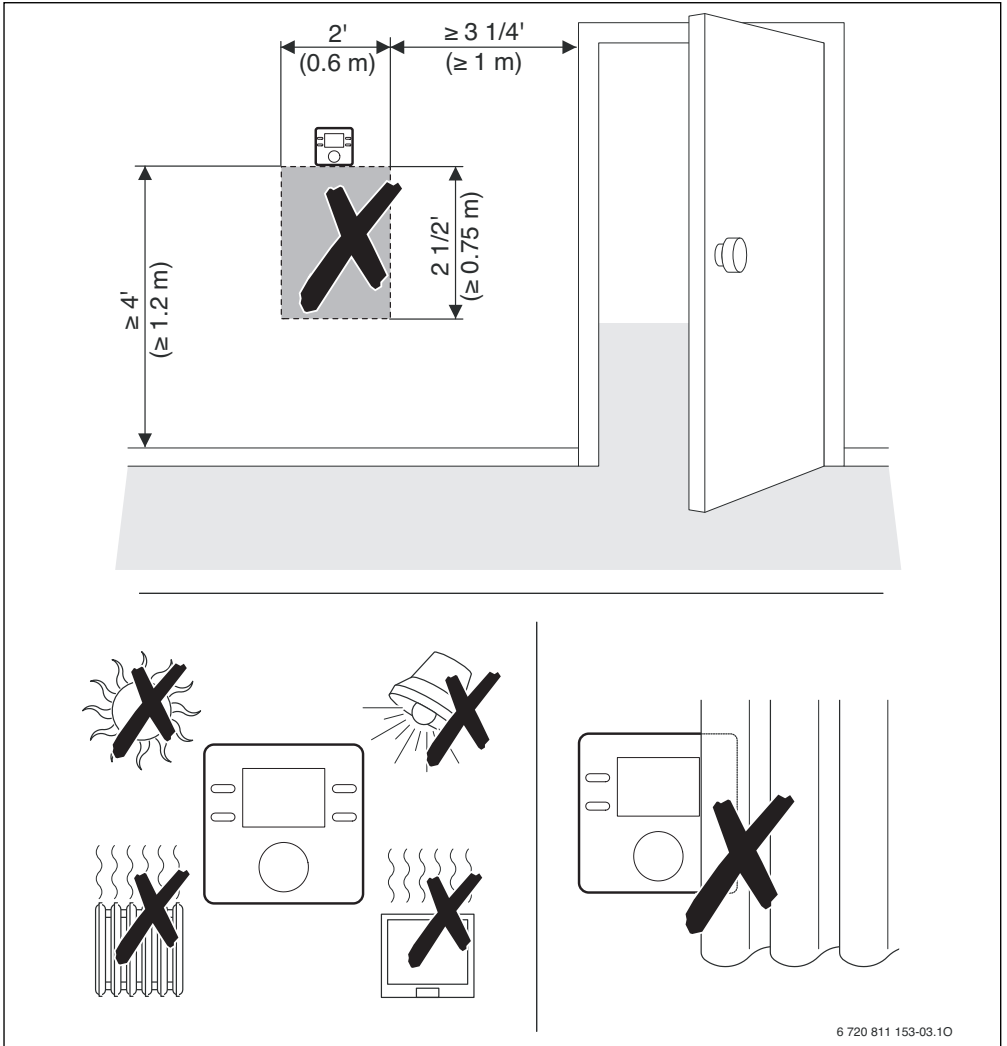
Fig. 5   Installation location in the reference room

3.2 Installation

ℹ️ The installation surface on the wall must be flat.
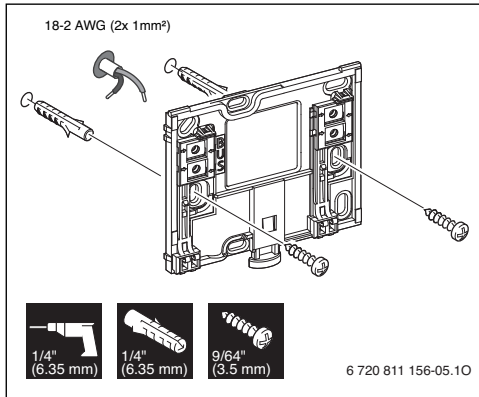▶ Install the base on a wall. (→ Fig. 6).

Fig. 6   Mounting the base

3.3 Power connection

Power is supplied to the user interface via EMS BUS.

Connections are not polarity specific.

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

Maximum total length of the BUS connections with AWG18 (0.75 mm^2): 492 ft. (150 m)

▶ If several BUS users are installed, maintain a minimum clearance of 4" (100 mm) between the individual BUS users.

▶ If several BUS users are installed, connect the BUS users in series or in a star pattern.

▶ To avoid inductive interference: Make sure all low-voltage cables are routed separately from line voltage cables (min. clearance 4" / 100 mm).

▶ In the case of outside inductive effects, use shielded cable and ground one end of the shield. Do not connect the shield to the connecting terminal for the ground conductor in the module; use the building ground instead, e.g. unused grounded terminal or water pipe.
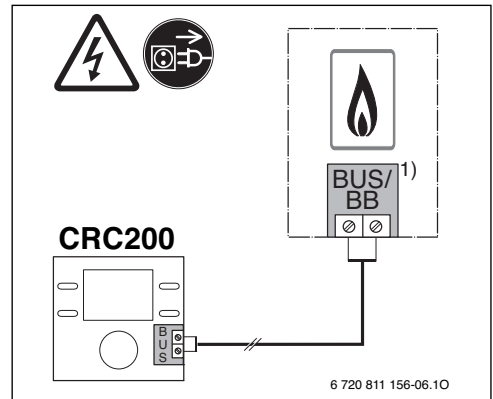
▶ Establish a BUS connection to the heat source.

Fig. 7   Connection of the user interface to a heat source

1) Terminal identification:
   On heat sources with an EMS BUS system terminals are: BUS or BB

The **outdoor temperature sensor** (accessory) needs to be connected to the heat source.

▶ Observe the instructions for the heat source when connecting the electrical supply.

When sensor leads are extended, apply the following lead cross-sections:

- Up to 66 ft. (20 m) with AWG18 (0.75 mm^2)
- 66 ft. (20 m) to 330 ft. (100 m) with AWG16 (1.50 mm^2).

3.4 Attaching or removing the user interface

Attaching the user interface

1. Attach the user interface at the top.
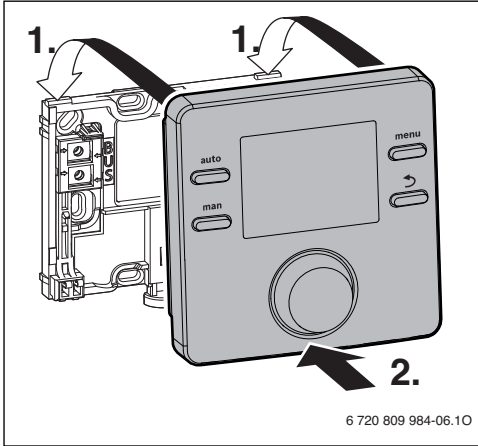2. Snap the bottom of the user interface into the base.

Fig. 8   Attaching the user interface

Removing the user interface

1. Push the knob on the underside of the base.
2. Pull the bottom of the user interface forwards.
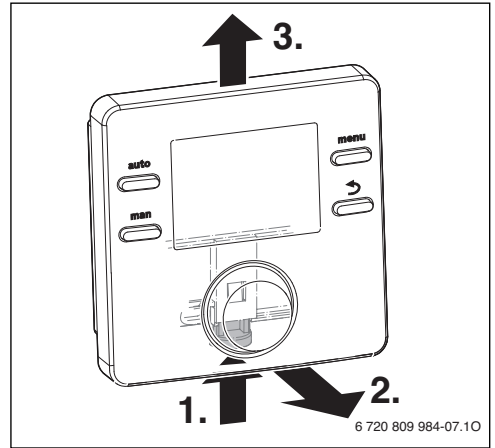3. Remove the user interface by lifting upward.

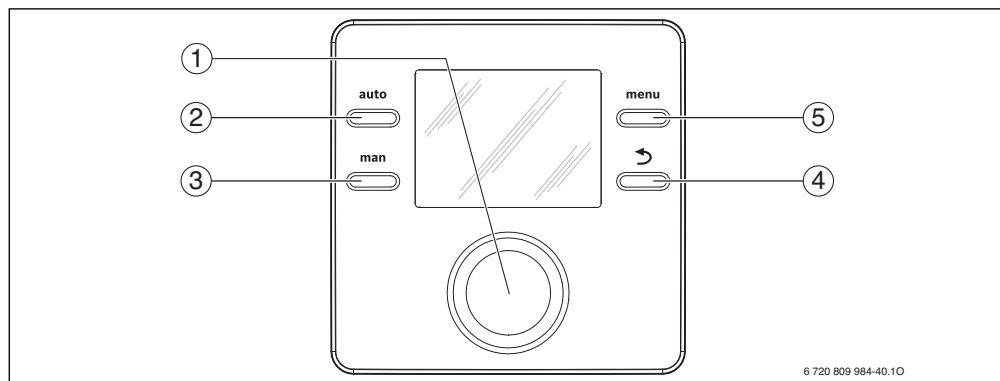*Fig. 9   Removing the user interface*
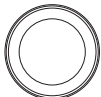
4 Controls

Fig. 10   Controls

Item	Element	Designation	Explanation
1		Dial	▶ Turn to change a setting value (e. g. temperature), or select from among the menus or menu items.
			▶ Press to open a menu or menu item, confirm a set value (e. g. temperature) or a message.
2	**auto**	**auto** button	▶ Press to activate the automatic mode with the time program.
3	**man**	**man** button	▶ Press to activate hold mode (manual operation) for a permanent room temperature set point.
4	↰	Back button	▶ Press to return to the higher menu level or discard a changed value.
			▶ Hold down to switch from a menu to the standard display.
5	**menu**	**menu** button	▶ Press to open the main menu.
			▶ Hold down to open the service menu.

Table 3   Controls

5 Commissioning

▶ First make all electrical connections and then carry out the commissioning.

▶ Observe the installation instruction for all components and assemblies in the system.

▶ Switch on the power supply only after all modules are coded.

▶ Set the heat source to the maximum supply temperature and DHW temperature needed and activate the automatic mode.

▶ Switch on the system.
Commission the user interface as shown in Table 4.

> **i** During the initial commissioning: Fill out the commissioning report in the operating instructions and in Chapter 11, Page 29.

The date, time and commissioning date are still present in the user interface when commissioning after a reset.
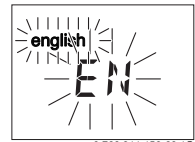
You can find an overview of all settings in Chapter 7, starting at page 15.

5.1 Basic settings

Basic settings

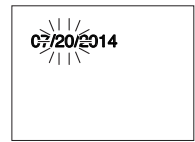|	
Once the user interface is connected to the power supply, the language selection appears on the display. The current setting starts to flash. ▶ Turn the dial to set the language and then press the dial.	
The display switches to the date setting. The current setting starts to flash. The user interface may obtain the current date automatically via the BUS system. ▶ Turn the dial to set the date and then press the dial. The format for displaying the date can be changed (→ operating instructions).	
The display switches to the time setting. The current setting starts to flash. The user interface may obtain the current time automatically via the BUS system. ▶ Turn the dial to set the time and then press the dial. The format for displaying the time can be changed (→ operating instructions).	
The display switches to the heating zone assignment. The current setting starts to flash. ▶ Press the dial in order to confirm the setting. **-or-** ▶ If several CRC200 are installed in the system:Turn the dial to assign one of the heating zones 2 to 8 and then press the dial.	
The display switches to automatic configuration. The current setting starts to flash. ▶ Turn the dial to select **YES** and then press the dial. Automatic configuration starts to detect the connected modules and temperature sensors. During automatic configuration the **Auto-Config.** display flashes	
Without automatic configuration following menu items have to be configured additionally: **Pump conn.** (only heating zone 1), **Control type**, **Ext.RoomSens.** and **Solar module**	
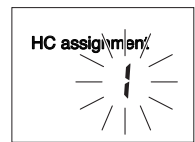
Table 4   Basic settings

Basic settings

Following automatic configuration, the display switches to guided system configuration. Which settings are available during guided system configuration depends on the installed system.
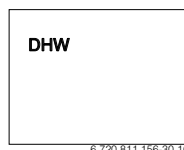
While in guided system configuration you can press the Back button to switch to the previous menu item.
A flashing display means you should turn the dial to change the setting or press the dial to confirm the shown setting.

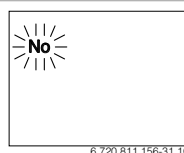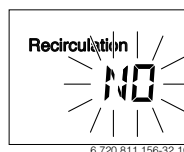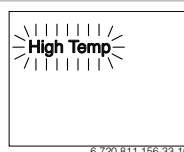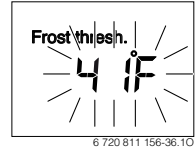|	
Available only on the user interface for heating zone 1 (not visible when a combi boiler is used). **DHW** appears on the display. You can set wether a hot water system is installed or how it is installed. For further details see table 5. ▶ If the display is not flashing, press the dial. ▶ Turn the dial to change the setting. ▶ Press the dial to switch to the next setting.	DHW 6 720 811 156-30.1O
Available only on the user interface for heating zone 1. **LLH Sensor** appears on the display. You can set wether a low loss header is installed and where its temperature sensor is connected. For further details see table 5. ▶ Press the dial to make the flashing default setting appear. ▶ Turn the dial to change the setting. ▶ Press the dial to switch to the next setting.	No 6 720 811 156-31.1O
Available only on the user interface for heating zone 1. **Recirculation** appears on the display. You can set wether a recirculation pump is installed. For further details see table 5. ▶ Press the dial. ▶ Turn the dial to change the setting. ▶ Press the dial to switch to the next setting.	Recirculation NO 6 720 811 156-32.1O
Heat. System appears on the display. You can set wether high temperature or low temperature heat radiation applies. For further details see table 5. ▶ Press the dial to make the flashing default setting appear. ▶ Turn the dial to change the setting. ▶ Press the dial to switch to the next setting.	High Temp 6 720 811 156-33.1O
Max. Suppl.T. appears on sthe display. You can set the maximum supply temperature. For further details see table 9. ▶ Press the dial. ▶ Turn the dial to change the temperature. ▶ Press the dial to switch to the next setting.	Max Suppl T. 167°F 6 720 811 156-34.1O
Frost protect appears on the display. You can set wether frost protection depends on room temperature or outdoor temperature. Outdoor temperature sensor must be installed for outdoor dependent frost protection. For further details see table 9. ▶ Press the dial to make the flashing default setting appear. ▶ Turn the dial to change the setting. ▶ Press the dial to switch to the next setting.	by Room Temp. 6 720 811 156-35.2O
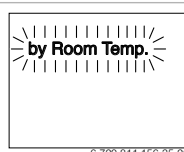
Table 4   Basic settings

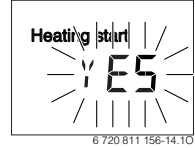| Basic settings	
Available only when outdoor sensor is connected and **Frost protect** is set to **by Outdoor Temp** or **Room - Outside**. **Frost thresh.** appears on the display. You can set the threshold outdoor temperatur for frost protection. For further details see table 9. ▶ Press the dial. ▶ Turn the dial to change the temperature. ▶ Press the dial to switch to the next setting.	Frost thresh. 41F 6 720 811 156-36.1O
Heating Start appears on the display. ▶ Press the dial. ▶ Turn the dial to select **YES** and press the dial. Configuration has been completed. The installation date of the CRC200 is set automatically. **-or-** ▶ Turn the dial to select **NO** and press the dial. The system configuration continues.	Heating start YES 6 720 811 156-14.1O
Upon selecting **YES** the CRC200 is configured as a controller. The heating system and possibly water heating are operating. Following configuration, only the menu items relevant for the configured system are displayed.	

Table 4   Basic settings

5.2 Checklist: Important settings for commissioning

Always perform commissioning so that the system operates as needed. Based on experience, the following settings are very important to satisfy the system user:

- **Control type**: outdoor reset (☼) with or without the influence of the room temperature, or room temperature-dependent
- **Heating curve** (☼): Adapted with reference to the design temperature, minimum outdoor temperature and other settings
- **DHW priority**: A heat demand for hot water has priority or hot water and heating have the same priority (if possible hydraulically)
- **Time program**: Determines when heating is active, see user manual for details.

How to change settings in the service menu is described in Chapter 8. Alternatively see the user manuals.

> **i** The installation date of the CRC200 is set automatically when the configuration is confirmed initially by starting the heating system.

6 Switching off power

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

▶ Disconnect power from the entire system and all BUS users.

> **i** 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 Main menu

	Further information on operation/navigation in the main menu can be found in the operating instructions.

▶ If the standard display is active, press the **menu** button briefly to open or close the main menu.
▶ Turn the dial to select a menu item or change the value of a setting.
▶ Press the dial to open the selected menu item, activate the input field for a setting or confirm a setting.

Fig. 11   Main menu summary

1) Set language.
2) Available only on the user interface for heating zone 1.
3) Service menu (→ Chapter 8)

8 Service menu

▶ If the standard display is active, press and hold the **menu** button for about three seconds until the service menu ⚙ appears in the main menu.

▶ Press the dial to open the already highlighted service menu ⚙.

▶ Turn the dial to select a menu item or change the value of a setting.

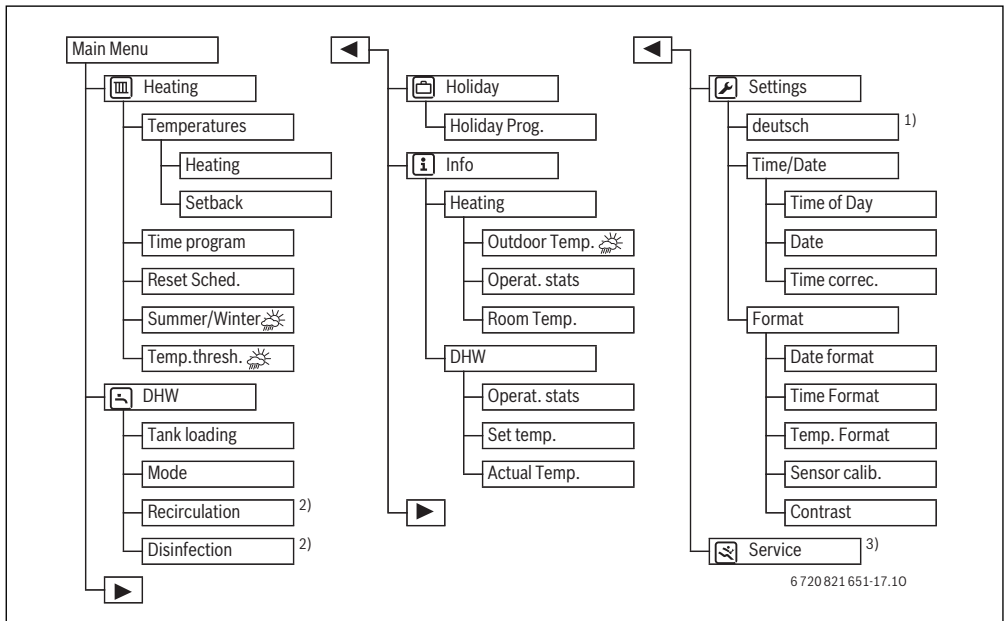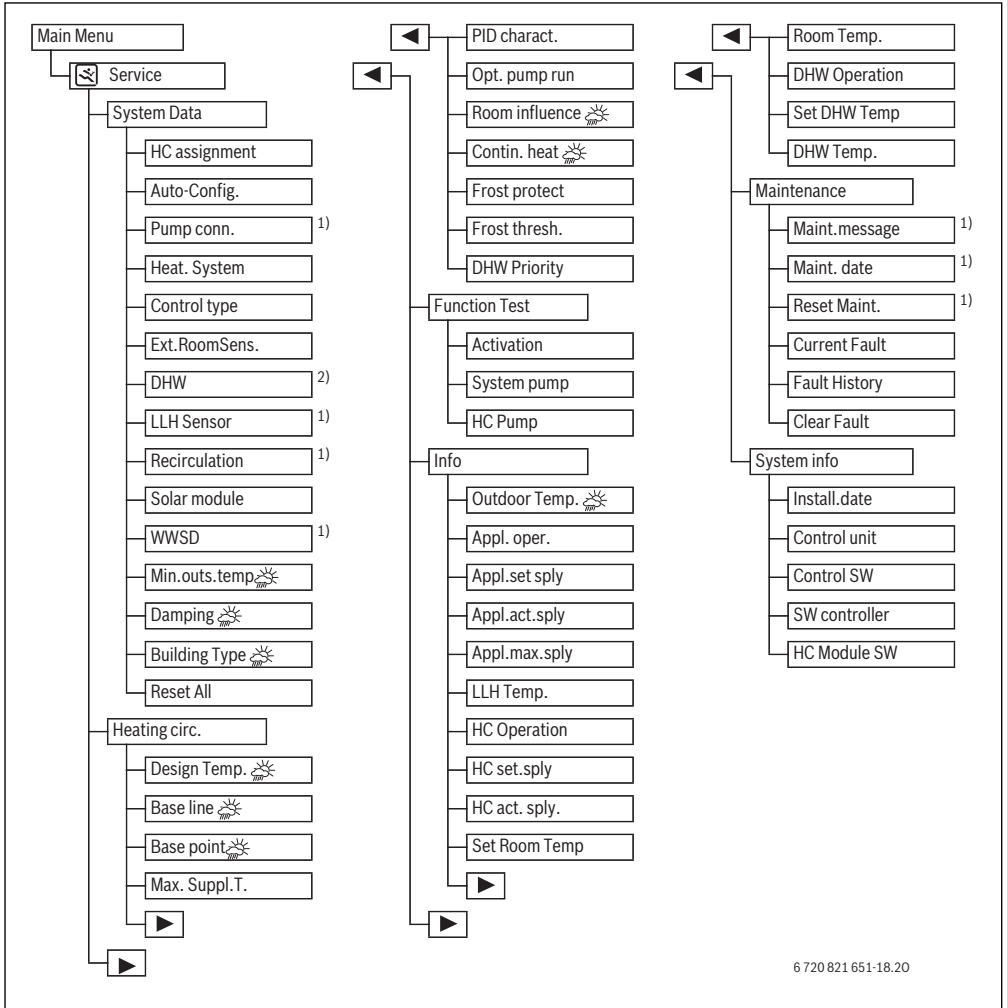▶ Press the dial to open the selected menu item, activate the input field for a setting or confirm a setting.

Fig. 12   Overview of the service menu

1) Available only on the user interface for heating zone 1.
2) Available if supported by heat source.

8.1 System data menu

The heating system is configured automatically or manually in this menu. With automatic configuration, important data are preset.

Menu item	Default setting	Control range	Functional description
HC assignment	1	1 … 8	Number of the assigned heating zone
Auto-Config.	NO	NO | YES	NO: Manual configuration of the system
			YES: Automatic system configuration, detects connected modules and temperature sensors and presets important data.
Pump conn.	see desciption	Heat Source | HC Module	Heat Source: Heating pump connected to heat source (only for heating zone 1). Heat Source is default if no CZM100 is detected.
			HC Module: Heating pump connected to CZM100. HC Module is default if CZM100 is detected.
Heat. System	High Temp	High Temp | Low Temp.	Assign the heating system to the heating zone to cancel the factory default.
Control type	Room supply	External simple | External opt. | Room supply | Room output	Select control type (details in → Chapter 2.1.1, Page 4)
			Outdoor reset operation (☼): External simple: simple outdoor reset control External opt.: optimized outdoor reset control
			Room temperature-dependent operations: Room supply: supply temperature control Room output: power output control (not possible if CZM100 is detected).
Ext.RoomSens.	NO	NO | YES	NO: The room temperature is determined by the internal temperature sensor of the user interface.
			YES: An additional room temperature sensor connected to the user interface (future feature; currently not available).
DHW (factory settings depend on installed heat source)		No | Yes, 3-wy vlv | Yes, pr. pump	DHW is only available if supported by the heat source (not visible at combi boilers)
			No: No hot water system installed in conjunction with boiler
			Yes, 3-wy vlv: Hot water system is supplied via 3-way valve
			Yes, pr. pump: Hot water system is supplied via indirect tank
LLH Sensor / System Supply Sensor	No	No | Yes, on mod.	LLH Sensor / System Supply Sensor is only available for heating zone 1
			No: No low-loss header installed
			Yes, on mod.: Low-loss header installed (even if temperature sensor is connected at heat source).
Recirculation	NO	NO | YES	Recirculation is only available for heating zone 1
			NO: The recirculation pump cannot be controlled by the heat source.
			YES: If the recirculation pump is to be controlled by the heat source, the recirculation pump must be activated here as well.
Solar module	NO	NO | YES	NO: No solar module connected.
			YES: No function in US/CA; no solar module available
WWSD	70 °F (21 °C)	OFF | 50...86 °F (10...30 °C)	Heating is off in the entire system at this set outdoor temperature. This saves energy at higher outdoor temperatures. (only for heating zone 1)

Table 5   Settings in the system data menu

Menu item	Default setting	Control range	Functional description
Min.outs.temp (☀)	14 °F (– 10 °C)	– 31…50 °F (– 35…10 °C)	Minimum outdoor temperature is the outdoor design temperature used in the heat loss calculation; only available when an outdoor temperature sensor is connected and outdoor reset mode is enabled.
Damping (☀)	ON	ON | OFF	This setting is only available when an outdoor temperature sensor is connected and outdoor reset mode is enabled.
			ON: The set type of building affects the measurement of the outside temperature. The outside temperature is delayed (dampened).
			OFF: The measured outside temperature is included undampened in the outdoor reset control.
Building Type (☀)	Medium	Tight | Medium | Loose	A measure of the thermal storage capacity of the heated building
			Tight: High storage capacity such as a brick house with thick walls (significant damping of the outdoor temperature)
			Medium: Medium storage capacity
			Loose: Low storage capacity such as a non-insulated weekend house made of wood (low damping of the outdoor temperature)
Reset All	NO	NO | YES	NO: The current settings have been retained.
			YES: The factory settings are being restored (except time and date).

Table 5   Settings in the system data menu

Minimum outside temperature (outdoor design)

The minimum outside temperature is the average value of each of the coldest outside temperatures or recent years, and it has an influence on the heating curve. The value of the region can be taken from the required heat load calculation that should be done for every building, or from the climate zone chart

▶ Set the minimum outside design temperature for the heating system.

Minimum outside temperature in °F (°C)			
Atlantic City	5 (– 15)	Montreal	– 9 (– 23)
Anchorage		New Orleans	19 (– 7)
Bermuda	59 (15)	New York	0 (– 18)
Boston	0 (– 18)	Ottawa	– 9 (– 23)
Buffalo	– 5 (– 21)	Philadelphia	0 (– 18)
Cleveland	– 4 (– 20)	Phoenix	25 (– 4)
Chicago	– 9 (– 23)	Pittsburgh	– 4 (– 20)
Dallas	10 (– 12)	Portland	– 5 (– 21)
Detroit	– 9 (– 23)	Quebec	– 15 (– 26)
Honolulu	59 (15)	Richmond	15 (– 9)
Houston	19 (– 7)	San Diego	35 (2)
Indianapolis	– 10 (– 23)	San Francisco	36 (2)
Los Angeles	36 (2)	St. Louis	0 (– 18)
Miami	36 (2)	Toronto	– 9 (– 23)
Minneapolis	– 20 (– 29)	Washington	0 (– 18)

Table 6   Minimum outdoor temperature for USA

8.2 Heating zone menu

Settings for the heating zone are made in this menu. With automatic configuration, important data are preset. Afterwards, only the relevant menu items appear in this menu.

Example: In case of outdoor reset control, the menu item for room temperature-dependent control is not displayed.

> ⚠ **NOTICE:** Risk of damaging or destroying the screed!
>
> ▸ If radiant floor heating (**Low Temp.**) is installed, observe the maximum supply temperature recommended by the manufacturer.

Menu item	default setting	Control range	Functional description
Design Temp (☼)	113 °F (45 °C)	86…140 °F (30…60 °C) (with Low Temp. heating) | 86…185 °F (30…85 °C) (only High Temp)	Only visible if Control type = External opt. (Optimized outdoor reset control) is selected: This is the supply temperature requested at the outdoor design temperature (see setting Min.outs.temp). The control range depends on the heating system selected.
Base point (☼)	77 °F (25 °C)	68 °F (20 °C) … End point (with Low Temp. heating)	Only visible if Control type = External simple (simple outdoor reset control) is selected: This is the supply temperature at fixed outside temperature of 68 °F (20 °C). The range is limited by the setting of the End point.
End point (☼)	113 °F (45 °C) (with Low Temp. heating)	Base point … 140 °F (60 °C) (with Low Temp. heating)	Only visible if Control type = External simple (simple outdoor reset control) is selected: This is the supply temperature requested at the outdoor design temperature (see setting Min.outs.temp). The range is limited by the setting of the Base point.
	167 °F (75 °C) (with High Temp heating)	Base point … 185 °F (85 °C) (with High Temp heating)	
Max. Suppl.T.	118 °F (48 °C) (Low Temp. heating) | 167 °F (75 °C) (only High Temp)	86…140 °F (30…60 °C) (with Low Temp. heating) | 86…185 °F (30…85 °C) (only High Temp)	Maximum supply temperature; the control range depends on the heating system selected.
PID charact.	Medium	Fast | Medium | Slow	Control characteristics (only visible when room temperature-dependent control is selected): Fast: Fast (2k P range), older home, loose construction, limited insulation Medium: Average (3k P range), Minimum building requirements, medium construction Slow: Slow (4k P range), newer home, tight construction, well insulated
Opt. pump run	NO	NO | YES	YES: Optimized pump operation active: The heating pump runs as little as possible on the basis of the supply temperature (available only with supply temperature control). This saves energy but may also reduce comfort. NO: If the system has more than one heat source installed (e. g. a hybrid system) or a buffer storage tank is installed, this function must be deactivated.

Table 7   Settings in the heating zone menu

Menu item	default setting	Control range	Functional description
Room Feedback (☼)	6 ℉ (3 ℃)	OFF | 2 ... 18 ℉ (1...10 ℃)	The outdoor reset control functions independent of the room temperature.
			The higher the setting value, the greater the influence of the room temperature on the heating curve.
Contin. heat (☼)	OFF	OFF | – 22...50 ℉ (– 30...10 ℃)	At this set outdoor temperature, setback no longer occurs. The system operates in the heating mode to prevent greater cooling.
Frost protect	by Room Temp.	OFF | by Outdoor Temp (☼) | by Room Temp. | Room - Outside (☼)	Note: To ensure frost protection for the heating zone, set outdoor temperature-dependent frost protection. This setting is independent of the set control type.
			Outdoor temperature-dependent settings are only shown with connected outdoor temperature sensor.
			OFF: Frost protection off
			Other: Frost protection is deactivated/activated on the basis of the temperature selected here (→ Threshold temperature for frost (frost protection limit temperature), Page 20)
Frost thresh.	41 ℉ (5 ℃)	– 4...50 ℉ (– 20...10 ℃)	→ Threshold temperature for frost (frost protection limit temperature), Page 20
DHW Priority	ON	ON | OFF	ON: Water heating is activated, the heat demand of the heating system is canceled
			OFF: Water heating is activated, the heat demand of the heating system is being met simultaneously (only possible if the hot water system is supplied via the tank pump)

Table 7   Settings in the heating zone menu

Threshold temperature for frost (frost protection limit temperature)

> ⚠ **NOTICE:** Risk of destroying hot water-conducting system components if the threshold temperature for frost is set too low and room temperatures are below 32 ℉ (0 ℃)!
> ▶ Only contractors are permitted to adjust the factory setting of the frost threshold temperature (41 ℉ / 5 ℃) for the system.
> ▶ Do not set the threshold temperature too low.
> Damage resulting from a frost threshold temperature set too low is not covered under warranty!
> ▶ Assured frost protection of the system is not possible without an outdoor temperature sensor.

> ℹ Outdoor temperature-dependent settings are only shown with connected outdoor temperature sensor.

With an outdoor temperature-dependent frost threshold temperature (☀) with or without the effect of room temperature , the following applies:

- If the outdoor temperature exceeds the set threshold temperature by 2 °F (1 K / °C) and there is no heat demand from the heating system, the heating pump switches off.
- If the outdoor temperature drops below the set threshold temperature, the heating pump switches on (system frost protection).

With a room temperature-dependent frost threshold temperature, the following applies:

- If the room temperature exceeds 45 °F (7 °C) and there is no heat demand from the heating system, the heating pump switch is off.
- If the room temperature drops below 41 °F (5 °C) the heating pump switches on (no system frost protection).

With a room- / outdoor temperature-dependent frost threshold temperature (☀), the following applies:

- If the room temperature drops below 41 °F (5 °C) or if the outdoor temperature drops below the set threshold temperature, the heating pump switches on (system frost protection).

---

i	The **by Room Temp.** setting does not offer absolute frost protection, because piping installed in soffits, for instance, can freeze. This can happen even though the temperature in the reference room is considerably above 41 °F (5 °C) as the result of outside heat sources. If an outdoor temperature sensor is installed, frost protection can be assured for the entire heating system regardless of the control type set:

  - ▶ In the **Frost protect** menu, set either **by Outdoor Temp** or **Room - Outside** (☀).

Set the heating system and heating curve for outdoor reset control

- ▶ Heating type (**High Temp** or **Low Temp.** heating) in the **System Data** > **Heat. System** menu. Adjust the system.
- ▶ Set the control mode (optimized or simple heating curve) in the **System Data** > **Control type** menu (☀).
  Menu items that are not required for the selected heating system and control mode are hidden.

The heating curve is the decisive basic factor for an economic and convenient operation of the heating system with outside temperature compensated control. To calculate the heating curve, the control system requires you to enter a number of parameters for the heating system, from which it automatically calculates the optimum heating curve by means of a mathematical formula.

This calculation takes into account the "damped" outside temperature and the room control temperature. The room control temperature is an internal parameter based on the desired room temperature (set room temperature) and the room influence factor.

This allows the end customer to influence the heating curve directly by modifying the set room temperature.

The most important settings are the design temperature, maximum supply temperature and minimum outdoor temperature.

The heating curve (→ fig. 13 and 14) is determined by the base point and end point. The base point exists with an adjusted outside temperature of 68 °F (20 °C) with a supply temperature of 77 °F (25 °C) (at a room temperature of 70 °F (21 °C)). The end point of the heating curve must be set according to the design temperature of the heating system.

The gradient of the characteristic heating curve (slope) is determined by the parameters **Min.outs.temp** (the lowest outdoor temperature expected in a particular region; page 18) and the **Design Temp** (the supply temperature which is to be reached at the minimum outside temperature) (→ fig 13 and 14, left).

The heating curve can be shifted up or down in parallel by matching the set room temperature (→ fig 13 and 14, right).

Optimized heating curve

The optimize heating curve (**Control type**: **External opt.**) is a curve that curves upward and is based on the precise

correlation between the supply temperature and the relevant outside temperature (☀).
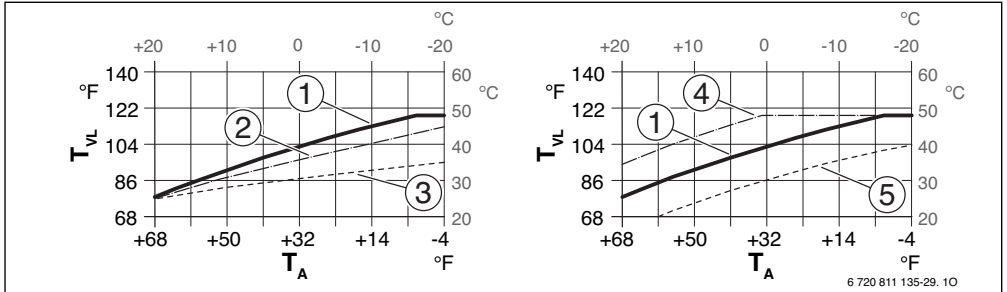

*Fig. 13   Settings for heating curve with **Low Temp.** heating*
Left: Slope changed by adjusting design temperature T_{AL} and minimum outdoor temperature $T_{A,min}$
Right: Parallel shifting over desired room temperaturer

T_A Outdoor temperature
T_{VL} Supply temperature
[1]   Setting: T_{AL} = 113 °F (45 °C), $T_{A,min}$ = 14 °F (−10 °C) (base curve), limited to $T_{VL,max}$ = 118 °F (48 °C)
[2]   Setting: T_{AL} = 104 °F (40 °C), $T_{A,min}$ = 14 °F (−10 °C), limited to $T_{VL,max}$ = 118 °F (48 °C)
[3]   Setting: T_{AL} = 95 °F (35 °C), $T_{A,min}$ = −4 °F (−20 °C), limited to $T_{VL,max}$ = 118 °F (48 °C)
[4]   Parallel shifting of the base curve [1] by increasing the desired room temperature, limited to $T_{VL,max}$ = 118 °F (48 °C)
[5]   Parallel shifting of the base curve [1] by increasing the reducing room temperature
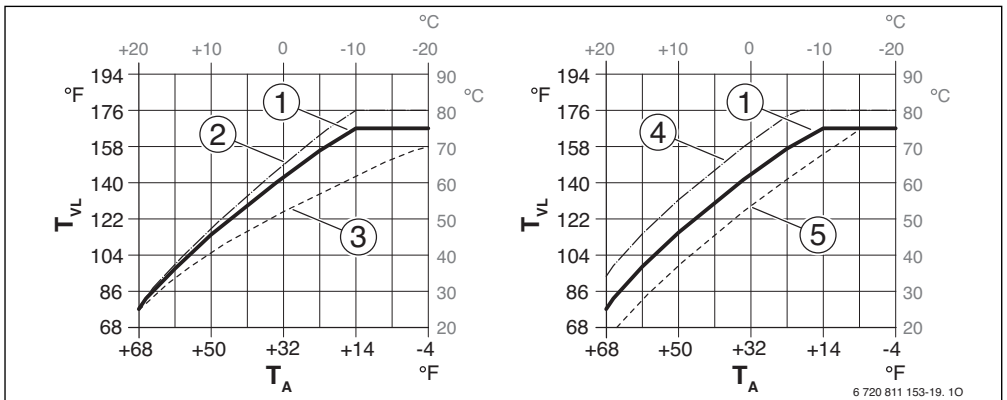

*Fig. 14   Settings for heating curve with **High Temp** heating*
Left: Slope changed by adjusting design temperature T_{AL} and minimum outdoor temperature $T_{A,min}$
Rechts: Parallel shifting over desired roomtemperaturer

T_A Outdoor temperature
T_{VL} Supply temperature
[1]   Setting: T_{AL} = 167 °F (75 °C), $T_{A,min}$ = 14 °F (−10 °C) (base curve), limited to $T_{VL,max}$ = 167 °F (75 °C)
[2]   Setting: T_{AL} = 176 °F (80 °C), $T_{A,min}$ = 14 °F (−10 °C), limited to $T_{VL,max}$ = 176 °F (80 °C)
[3]   Setting: T_{AL} = 158 °F (70 °C), $T_{A,min}$ = −4 °F (−20 °C), limited to $T_{VL,max}$ = 167 °F (75 °C)
[4]   Parallel shifting of the base curve [1] by increasing the desired room temperature, limited to $T_{VL,max}$ = 176 °F (80 °C)
[5]   Parallel shifting of the base curve [1] by increasing the reducing room temperature, limited to $T_{VL,max}$ = 167 °F (75 °C)

Simple heating curve

The simple heating curve (**Control type**: **External simple**) is a simplification of the curved heating curve as a straight line. The straight line is described by two points ($\underset{min}{\overset{\cdot}{\times}}\times$).

	Low Temp. heating	High Temp heating
Minimum outside temperature $T_{A,min}$	14 °F (−10 °C)	14 °F (−10 °C)
Base point	77 °F (25 °C)	77 °F (25 °C)
End point	113 °F (45 °C)	167 °F (75 °C)
Maximum supply temperature $T_{VL,max}$	118 °F (48 °C)	167 °F (75 °C)

Table 8   Factory settings for the simple heating curve

8.3   Function test menu

Using this menu, the pump/valve for each assigned heating zone can be tested. They are tested by setting various setting values. You can check whether the pump/valve responds appropriately by observing the response of the corresponding component. If **Activation** is set to **YES** in this menu, the normal heating mode 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 **Activation** is set to **NO** or the **Function Test** menu is closed.

⚠ **CAUTION:** Risk of scalding if tank temperature limiter is deactivated during the function test!
▶ Close all DHW taps.
▶ Inform occupants of the premises of the risk of scalding.

Menu item	default setting	Control range	Functional description
Activation		**NO** | YES	NO: The actuators revert to their previously stored position so that the system starts up again after the function tests in the same condition as when shut down.
			YES: The instantaneous operating status (mixer: actuation stroke; pump: stage or speed) of the actuators in the system is saved. All actuators in the system switch to the test mode.
System pump	0 (in %)	0 | 100 (in %)	0: System pump for heating zones with valves not running (switched off).
			100: System pump for heating zones with valves running at maximum speed.
HC Pump	0 (in %)	0 | 100 (in %)	0: Heating pumps not running/zones valves closed (off).
			100: Heating pumps running/zones valves open (on).

Table 9   Settings in the function test menu

8.4 Info menu

Heating system settings and measurements are displayed in
this menu. No changes can be made.

Menu item	Possible values	Description
Outdoor Temp. (☼)	– 40…122 °F (– 40…50 °C)	The currently measured outdoor temperature is available only if an outdoor temperature sensor is installed.
Appl. oper.	ON	Burner operating
	OFF	Burner not operating
Appl.set sply	68…194 °F (20…90 °C)	Supply temperature required at the heat source (set temperature)
Appl.act.sply	68…194 °F (20…90 °C)	Supply temperature measured at the heat source (actual temperature)
Appl.max.sply	95…194 °F (35…90 °C)	Maximum supply temperature set at the heat source
LLH Temp.	68…194 °F (20…90 °C)	Current hot water temperature in the low-loss header
HC Operation	OFF	Current operating mode of assigned heating zone, → User interface operating instructions
	Heating	
	Setback	
	Summer	
	Manual	
HC set.sply	68…194 °F (20…90 °C)	Required supply temperature in assigned heating zone
HC act. sply.	68…194 °F (20…90 °C)	Measured supply temperature in heating system
Set Room Temp	OFF	Heating switched off, e. g. in the summer
	41…86 °F (5.0…30.0 °C)	Desired room temperature
Room Temp.	41…86 °F (5.0…30.0 °C)	Measured room temperature
DHW Operation	ON	Water heating active
	OFF	Water heating not active
Set DHW Temp	59…176 °F (15…80 °C)	Desired hot water temperature
DHW Temp.	59…176 °F (15…80 °C)	Measured hot water temperature

Table 10   Info menu

8.5 Maintenance menu

Service-relevant settings are made in this menu, e. g. deleting the list of faults after all faults have been rectified in the course of service.

If the service display is set directly at the heat source on the basis of the run time or burner hours, the setting **Maint.message** appears under **ON**, but the **Maint. date** cannot be set.

Menu item	default settings	Control range	Functional description
Maint.message	OFF	ON	OFF	Maint.message is not available for heating zone 1.
			No service display appears on the user interface.
			A service display appears on the screen of the user interface on the set date (→ Maint. date).
Maint. date		01/01/2012 – 12/31/2099	Date for next heating system maintenance. (only for heating zone 1)
Reset Maint.	NO	NO	YES	Reset Maint. is not available for heating zone 1.
			The service display is not reset.
			The service display is reset.
Current Fault		e. g. 09/29/ 2014 A11/802	All current faults are displayed, arranged in order of fault severity: the fault date appears in the text line, the fault code and sub-code flash alternately in the value display.
Fault History		e. g. 07/31/ 2014 A02/816	The last 20 faults are displayed, arranged in order of the time of occurrence. The fault date appears in the text line, the fault code and sub-code flash alternately in the value display.
Clear Fault	NO	ON	OFF	The fault history is retained.
			The fault history is deleted.

Table 11   Settings in the maintenance menu

8.6 System info menu

Detailed information about the BUS users in the system can be queried in this menu. No changes can be made.

Menu item	Display example	Functional description
Install.date	09/14/2014	The date of the first confirmed configuration is recorded automatically.
Control unit	xxx.x	Designation of the heat source controls
Control SW	1.xx	Software version of the heat source controls
	2.xx	
SW controller	NFxx.xx	User interface software version
HC Module SW	NFxx.xx	CZM100 software version [1]

Table 12   System info

1) Not available if a corresponding module is installed.

9 Troubleshooting

A fault appears on the display of the user interface. The cause can be a fault on the user interface, in a component, in an assembly or on the heat source. The instructions belonging to the affected component, assembly or heat source used and especially the service manual with detailed fault descriptions contain additional information on troubleshooting. Many heat source faults do not appear on the display of the user interface. They are described in the documents for the heat source used.

The last 20 faults that occurred are saved with a time stamp (fault history, → Page 25).

> **i** Use only original spare parts. Damage resulting from spare parts not supplied by the manufacturer is not covered under warranty. If a fault cannot be corrected, contact the service technician responsible for your area or the nearest Bosch office.

Fault code	Sub-code	Cause or fault description	Testing sequence/Cause	Measure
A11	6004	Solar module wrongly activated	–	Deactivate solar module in the service settings (→ Bild 12, Seite 16).
A12	815	Supply temperature sensor faulty (3201 = Heating zone 1; ... 3208 = Heating zone 8)	Check cable connecting supply temperature sensor and zone module	If there is a fault, replace cable/sensor
			Check connection between zone module and supply temperature sensor	If screws or a plug is loose, rectify the contact problem
			Check the supply temperature sensor against its data table	If values do not agree, replace the sensor
			Check the voltage to the connection terminals of the supply temperature sensor on the zone module against its data table	If sensor values agree but the voltage values do not, replace the zone module
A31 ... A38	3101 ... 3108	Zone module has no communication to CRCx00 in the heating zone (3101 = Heating zone 1; ... 3108 = Heating zone 8)	Check configuration on the corresponding controller	Assign the correct heating zone and set **Control type** to **Room supply**, if outdoor temperature sensor not installed.
			Check heating zone assignment on other controllers	Assign the correct heating zones
			Check if cable for EMS connection is damaged	Replace damaged cable
			Controller defective	Replace defective controller
A31 ... A38	3201 ... 3208	Zone module detects unreasonable status of the end switch (3201 = Heating zone 1; ... 3208 = Heating zone 8)	Check corresponding zone valve and end switch for status and defects	Replace faulty zone valve or end switch
			Module wrongly configured: switch is in the wrong position.	See installation instructions CZM100, chapter 2.2

Table 13 Fault table

Fault code	Sub-code	Cause or fault description	Testing sequence/Cause	Measure
A61 ... A68	1005	System configuration not confirmed *(A61 = Heating zone 1;* *...* *A68 = Heating zone 8)*	System configuration not completed	Configure system completely and confirm
A61 ... A68	1010	No communication via BUS connection EMS *(A61 = Heating zone 1;* *...* *A68 = Heating zone 8)*	Check whether bus cable was connected incorrectly	Rectify wiring faults and switch controller off and on again
			Check whether bus cable is faulty.	Repair or replace the bus cable
			Remove expansion module from BUS and switch controller off and on again. Check whether the cause of the fault is a module or module wiring	Replace faulty BUS user
A61 ... A68	1030 1034 1035 1036	Internal data error of the controller. *(A61 = Heating zone 1;* *...* *A68 = Heating zone 8)*	Controller faulty	Replace controller
A61 ... A68	1037	Outdoor temperature sensor faulty *(A61 = Heating zone 1;* *...* *A68 = Heating zone 8)*	Check configuration. The selected setting requires an outdoor temperature sensor.	If an outdoor temperature sensor is not desired. Select the room temperature-dependent configuration in the controller.
			Check the connecting cable between the controller and outdoor temperature sensor for continuity	If there is no continuity, rectify the fault
			Check the electrical connection of the connecting cable in the outdoor temperature sensor or on the plug in the controller	Clean corroded connecting terminals in the outdoor sensor housing.
			Check the outdoor temperature sensor in accordance with table (→ Technical documentation for the heat source)	If values do not match, replace the sensor
			Check the voltage at the connecting terminals of the outdoor temperature sensor in the controller in accordance with table	If the sensor values matched, but the voltage values do not match, replace the controller
A61 ... A68	1038	Invalid time/date *(A61 = Heating zone 1;* *...* *A68 = Heating zone 8)*	Date/time not yet set	Set date/time
			Prolonged loss of power supply	Avoid voltage failures

Table 13 Fault table

Fault code	Sub-code	Cause or fault description	Testing sequence/Cause	Measure
A61 ... A68	1051 ... 1058	External room sensor not available *(A61 = Heating zone 1;* *...* *A68 = Heating zone 8)*	Wrong configuration in the controller for external room sensor.	Change to No in service menu (external room sensor is not yet available)
A61	3011	CRC200 in heating zone 1 wrongly configured	Check the configuration of controller in heating zone 1. A zone module is detected but not allowed with current settings	If a zone module is to be installed, set the setting **Control type** to **Room supply**, if outdoor temperature sensor not installed.
A61 ... A68	3011 ... 3018	CRCx00 with corresponding heating zone is missing *(A61 = Heating zone 1;* *...* *A68 = Heating zone 8)*	Check the configuration of the controller for the corresponding heating zone	Assign the heating zone properly.
			Check connection to controller and connecting cable	Connect controller properly with a functioning cable
			Check if controller is faulty	Replace faulty controller
A61 ... A68	3061 ... 3068	No communication with zone module *(A61 = Heating zone 1;* *...* *A68 = Heating zone 8)*	Check connection to zone module and connecting cable	Connect controller and zone module properly with a functioning cable
			Check if zone module is faulty	Replace faulty zone module
A61 ... A68	3091 ... 3098	Room temperature sensor faulty *(3091 = Heating zone 1;* *...* *3098 = Heating zone 8)*	Controller faulty	Replace controller

Table 13   Fault table

10   Environmental protection/disposal

Environmental protection is one of the fundamental company policies of the Bosch Group. We regard quality of performance, economy and environmental protection as equal objectives. Environmental protection laws and regulations are strictly adhered to. To protect the environment, we use the best possible technology and materials taking into account economic points of view.

Packaging

For the packaging, we participate in the country-specific recycling systems, which guarantee optimal recycling. All packaging materials used are environmentally-friendly and recyclable.

Old appliances

Old appliances contain resources that should be recycled. The components are easy to separate and the plastics are marked. This allows the various components to be sorted for appropriate recycling or disposal.

11   Setup log (Service menu/contractor)

|⌞__,___,___⌟|ˉ|⌞__,___,___⌟|ˉ|⌞__,___,___,___⌟|ˉ|⌞__,___,___,___⌟|

Table 14   Enter the ID number on the backside of the user interface here. Removal from wall plate has to be done to look at the ID.

Customer/system user	Installer
....	
....	
Date commissioned:	

Menu item	Selection
System data (for details see →Table. 5, Page. 17)	
HC assignment	☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8
Pump conn.	☐ Heat Source ☐ HC Module (CZM100)
Heat. System	☐ High Temp ☐ Low Temp.
Control type	☐ External simple ☐ External opt. ☐ Room supply ☐ Room output
DHW	☐ No ☐ Yes, 3-wy vlv ☐ Yes, pr. pump
LLH Sensor	☐ No ☐ Yes, on mod.
Recirculation	☐ NO ☐ YES
WWSD	☐ OFF | °F (°C)
Min.outs.temp	°F(°C)
Damping	☐ OFF ☐ ON
Building Type	☐ Tight ☐ Medium ☐ Loose

Table 15   Setup log

Menu item	Selection
Heating zone (for details see →Table. 7, Page. 17)	
Design Temp	°F(°C)
Base point	°F(°C)
End point	°F(°C)
Max. Suppl.T.	°F(°C)
PID charact.	☐ Fast ☐ Medium ☐ Slow
Opt. pump run	☐ NO ☐ YES
Room Feedback	K
Contin. heat	☐ OFF | °F (°C)
Frost protect	☐ OFF ☐ by Outdoor Temp ☐ by Room Temp. ☐ Room - Outside
Frost thresh.	°F(°C)
DHW Priority	☐ OFF ☐ ON
DHW	
Max. DHW Temp	°F(°C)
Maintenance	
Maint. date	

Table 15   Setup log

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