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CRC100

Comfort Room Controller 100



BOSCH




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1 Explanation of symbols and safety instructions

1.1 Explanation of symbols

Symbol	Function
▶	Sequence of steps
→	Cross-reference to other points in this document or to other documents
	Flashing display (e. g. flashing 4)

1.2 Safety instructions

Installation and commissioning

- ▶ Observe all federal, state and local regulations and standards during installation and operation!
- ▶ Observe all instructions to ensure satisfactory operation.
- ▶ Have the CRC100 installed and commissioned by an authorized heating contractor only.
- ▶ Do not install the CRC100 in wet rooms.
- ▶ Install and commission heat source and other accessories according to the relevant instructions.
- ▶ Do not connect the CRC100 to 120 V.
- ▶ Before installing the CRC100: isolate all poles of heat source and all other BUS subscribers from the power supply, secure against unintentional reconnection and make sure the power supply is disconnected.
- ▶ Electrical components must be installed by a trained electrician and the installation must meet the National Electric Code as well as all applicable local codes and regulations.
- ▶ Install a separate circuit breaker rated at least 15 A for the heating system.
- ▶ All line voltage wiring must use at least AWG14 size cables.

Risk of damage from operator error

Operator errors can cause injury and damage to property:

- ▶ Instruct the customer in the functions and operation of the CRC100.
- ▶ Make sure that only individuals who can operate the CRC100 correctly have access to it.

Risk of damage from frost

The heating system can freeze when not in operation:

- ▶ Leave the heating system on if the outside temperature is below 32 °F (0 °C).
- ▶ If the CRC100 is used as a controller, system frost protection is not possible. A CRC100 can provide frost protection for each specific zone connected to. A CRC100 does not provide frost protection for the heat source or the rest of the heating systems.
- ▶ Correct any faults immediately.

2 Product description

- **Room temperature-dependent controller (A.1 = CO):** The CRC100 can be used for a heating system with one heating zone. This method of operation is used when the CRC100 is connected directly to the heat source. This will modulate the percentage of power output the heat source is supplying.
- **Zone controller (A.1 = SC):** The CRC100 can be used for one heating zone with a CZM100. A maximum of 8 heating zones is permitted when connected to several CZM100. Alternatively the CRC200 may be used instead of a CRC100.
- For heat sources with EMS BUS terminals; Bosch Greenstar Boilers and Buderus GB Series Boilers. This method of control is used to provide a modulated supply temperature set point from the room to the heat source.
- The CRC100 can be used as a controller for heat sources with an external indirect tank and circulator pump, but the DHW maximum temperature and priority settings are made at the heat source.
- Combination with IPM2, ISM2, ICM, FB100 or FW200 is not possible.
- Some settings are not available, depending on the heat source connected to.
- When connected to CZM100 the CRC100 will have a default WWSD temperature of 70 °F (21 °C). This setting can be changed if a CRC200 is connected to zone one of the CZM100 module.

2.1 Function as room temperature-dependent controller (A.1 = CO)

The CRC100 monitors the room temperature and controls the temperature in the heat source to produce the required room temperature.

Power output control (P.1 = 5): The power output of the heat source changes according to the deviation between the current and required room temperature. There are fewer burner starts and shorter pump runtimes, which saves energy and enhances the boiler's and the pump's lifetime. This control mode is not available, depending on the connected heat source.

Supply temperature control (P.1 = 4): The supply temperature changes according to the deviation between the current and required room temperature. This method of control is suitable for apartments and residential houses.

2.2 Function as zone controller (A.1 = SC)

The CRC100 can be used as a controller for one of max. 8 heating zones in combination with CZM100 modules (further information → technical documentation of the CZM100). The control of the zone temperature works equal to that of the temperature-dependent controller.

3 Scope of delivery

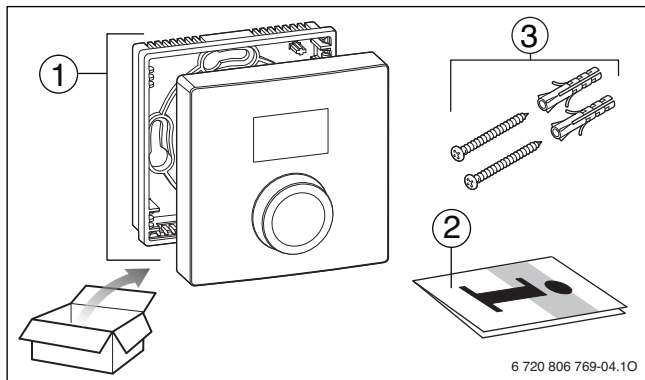


Fig. 1 Scope of delivery

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

4 Technical specifications

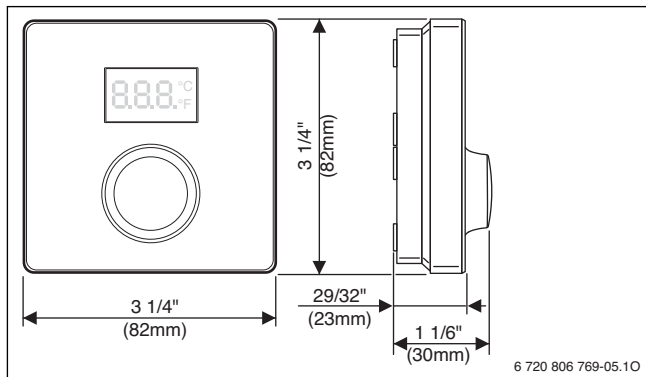


Fig. 2 Dimensions

Technical Data

Dimensions (W × H × D)	3 1/4" x 3 1/4" x 1 1/6" (82 × 82 × 30 mm)
Rated voltage	10 – 24 V DC
Nominal current	4 mA
BUS interface	EMS (2-wire BUS)
Control range	41 – 86 °F (5 – 30 °C)
Permiss. ambient temperature	32 – 140 °F (0 – 60 °C)
Protection class	III
Protection level	IP20

Product ID on the backside of the product (to be entered by the installer). Removal from wall plate has to be done to look at the ID.



5 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.

6 Operation

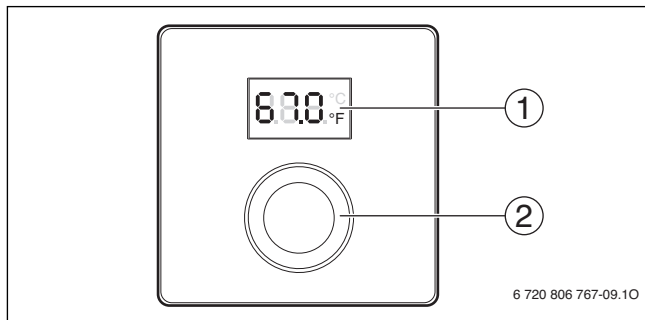





Fig. 3 Overview of control elements

1	Display	
2	Dial	Turn to choose and change settings. Press to confirm entry or switch display.

Description of the displays	Example
Current room temperature (standard display)	
Desired room temperature ▶ Press dial to briefly show the required room temperature (flashing).	
Service display (maintenance required, further information → Installation manual of the boiler) ▶ Press the dial to switch to the standard display.	
Fault display with fault code and sub code alternating (further information → chapter 9, page 18 and where applicable installation manual of the boiler) ▶ Press dial to briefly show the current room temperature.	

Set the desired room temperature	Conclusions
<ul style="list-style-type: none"> ▶ Turn dial in order to set the desired room temperature. (mind the maximum supply temperature of the heat source) 	
<ul style="list-style-type: none"> ▶ Press the dial to apply the setting. 	

Switch off the heating system	Conclusions
<ul style="list-style-type: none"> ▶ Turn the dial anti-clockwise to reduce the required room temperature until OFF shows on the display. The setting is applied automatically. When the heating is switched off, frost protection for the room is also switched off. Frost protection of the heat source (boiler) remains active. 	

7 Energy-saving tips

- For every 3°F the boiler temperature is reduced, a 1% fuel saving is achieved. For every 1°F the thermostat is reduced during heating season a 3% fuel savings can be achieved.
- Zoning allows for less frequently used rooms to be set to a lower temperature than the common areas. Thus saving energy.

8 Information for installers

8.1 Installation on the wall

Do not place obstructions within $2\ 1/2'$ (0.75 m) below or $1\ 3/4'$ (0.5 m) above CRC100.

- ▶ Selecting suitable installation location on a flat wall.

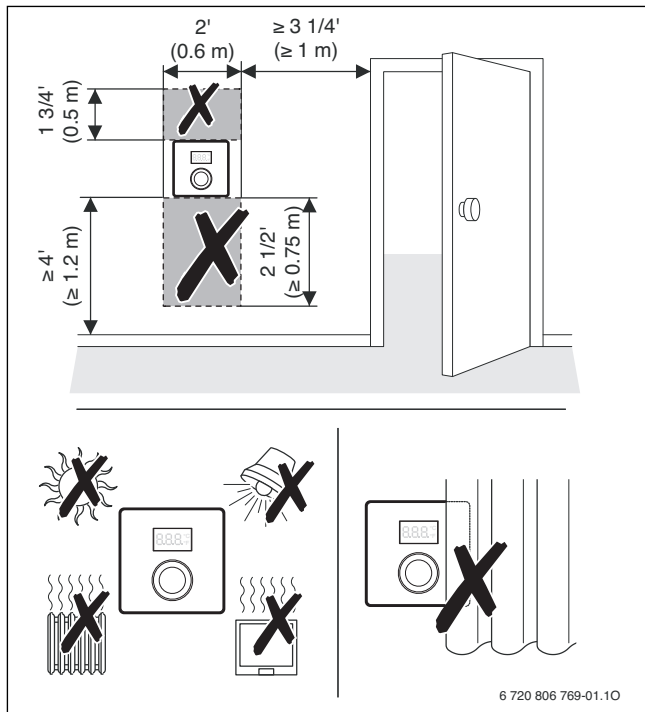


Fig. 4 Selecting suitable installation location on a flat wall

- Install CRC100 (→ Figures 5 and 6).

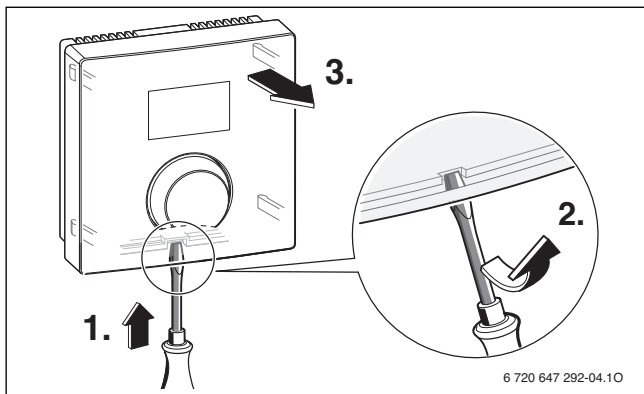


Fig. 5 Removing CRC100 from wall base

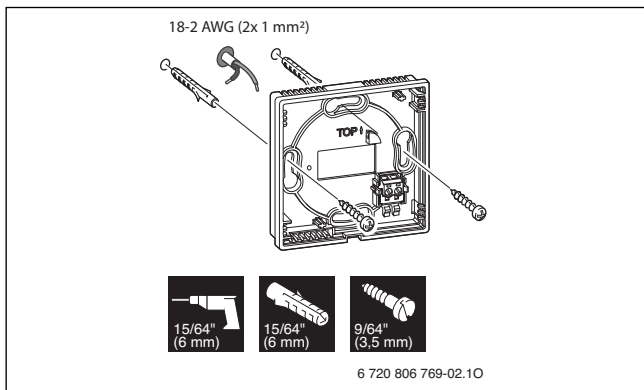


Fig. 6 Installing wall base

8.2 Power connection

Power is supplied to the user interface via the BUS cable.

- ▶ Maintain a minimum clearance (4 " / 100 mm) between each of the comfort room controllers.
- ▶ Use a cable of at least type AWG 18 (0.75 mm²).
- ▶ Make sure low-voltage cables are routed separately from line voltage cables (min. clearance 4 " / 100 mm).
- ▶ If two or more CRC100 are going to be installed, a CZM100 is mandatory. For further details please refer to the technical documentation of the CZM100.
- ▶ If the conductor cross-sections are different, use the junction box to connect the BUS nodes.

Maximum total length of all BUS connections in the system is: 492 ft. (150 m)

- ▶ Make the BUS connection.

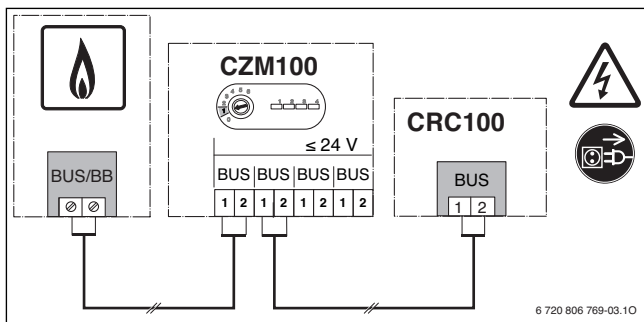


Fig. 7 Making BUS connection between CRC100 and boiler

8.3 Commissioning

The following tables show first commissioning or commissioning of the user interface after a reset.

Systems with one heating zone (room controller)

- ▶ Switch system ON/reset CRC100.

The Display shows 3 dashes, until the connection to the boiler is established.



No further settings are required. The room temperature is displayed.



Systems with several heating zones (with CZM100 comfort zone manager installed)

- ▶ Switch system ON/reset CRC100.

The Display shows 3 dashes, until the connection to the boiler is established.



1. Set the value "SC" (→ chapter 8.4) in code "A.1" and confirm.



2. To set the CRC100 to a specific zone, select the value 1 – 8 in code "H.C" (→ chapter 8.4) and confirm.



8.4 Settings in the service menu

Overview of settings

Code	Default setting	Control range	Description
A.1	SC	CO SC	CO: Controller, when communication directly to heat source. SC: Zone Controller, when connecting to CZM100 for specific zone control
H.C	1	1 – 8	Heating Zone options 1 thru 8. Set each CRC to a specific zone.
d.1	3	2 3 4	Control Characteristics: 2 : Fast (2k P range), older home, loose construction, limited insulation 3 : Average (3k P range), Minimum building requirements, medium construction 4 : Slow (4k P range), newer home, tight construction, well insulated
E.1	0.0	- 3.0 ... + 3.0	Calibration setting used to correct any deviation between CRC100 and actual temp.
P.1	4	4 5	4- Supply temp control [°F] means setpoint to appliance 5 – Power output [%]; only selectable if “CO” (controller) is selected in code A.1
L.1	0	0 1	Optimization of pump runtime 0: not active 1: active
C.1	F	C F	Unit of Measure to display temperature F = °F or C = °C
S.1	-	nF.12.01	Software version; information only; no adjustments possible ¹⁾
F.1	0	1 0	1: Reset to factory default settings

1) Turn the dial to read off the whole value.

Reset or power failure

In the event of a reset (with **F.1** = 1), the CRC100 goes back to its standard settings, i. e. it appears after this as a controller for plug & play with all its factory settings.

On restarting after a power failure, the CRC100 appears as the previously configured user interface, i. e. it is able to appear as a zone controller with the associated heating zone allocation.

Operation

The following tables contain examples showing how to change a value in the service menu.

Open the service menu	Conclusions
1. Press and hold dial until two dashes appear.	
2. Release dial to display the first setting.	

Changing the setting (e. g. heating zone H.C)	Conclusions
1. Turn the dial to select a setting.	
2. Press dial to show the current value.	
3. Press dial to change the value.	
4. Turn dial to set the required value.	
5. Press the dial to store the setting.	
6. Press and hold dial until the setting is displayed again.	

Close the service menu	Conclusions
1. Press and hold dial until three dashes appear.	
2. Release dial. The display changes to the standard display, and the user interface works with the changed setting.	

9 Troubleshooting

- ▶ If a fault is displayed, record the fault code and the sub code.

If a fault persists:

- ▶ Call approved contractor or customer service.
- ▶ Advise type of fault and ID no. of user interface.

9.1 Temperature-related faults

Problem	Cause	Remedy
The required room temperature has not been achieved.	System is air bound	Bleed and purge heating system and heat source.
	Supply temperature	Set the maximum supply temperature higher at the heat source (boiler).
	Wrong measurement	Check E.1 setting; adjust the deviation between CRC100 and actual temp.
The room temperature is higher than the set value.	Supply temperature	Confirm the room temperature is consistently high throughout the room. Confirm the controller is installed in a proper location, not exposed to the sun and you are not heating the room with other electrical components. If it is consistent adjust heating supply temperature.
	Installation location	Have heating contractor move user interface to a suitable location.
The room temperature fluctuates sharply.	Installation location	Have heating contractor move user interface to a suitable location.

9.2 Display of a current fault

If a fault occurs the display shows the respective fault code and the 3 digit sub code. In case of 4 digit sub codes, after displaying the fault code the display shows the first 2 digits and then the last 2 digits of the sub code (e. g.: A21 ... 10 ... 01 ... A21 ... 10 ...).

Fault code	Sub-code	Possible causes and assistance from the contractor
A12	815	Supply temperature sensor defective. ▶ Replace faulty temperature sensor.
A31 ... A38	3101 ... 3108	Zone module has no communication to CRCx00 in heating zone y (A31/3101: heating zone 1, ..., A38/3108: heating zone 8). ▶ Set A.1 = SC (zone controller) on corresponding controller. ▶ Set H.C. on corresponding controller according to its heating zone.
A31 ... A38	3201 ... 3208	Status on end switch for zone valve is not reasonable. (A31/3201: heating zone 1, ..., A38/3208: heating zone 8) ▶ Check corresponding zone valve and end switch for status and defects.
A61 ... A68	1010	No communication via EMS-BUS connection (A61: heating zone 1, ..., A68: heating zone 8). ▶ Connect the controller via a working EMS-BUS cable to a zone module or a boiler.
A61 ... A68	1030 1034 1035 1036	Internal data error of the CRC100 (A61: heating zone 1, ..., A68: heating zone 8). The sub-code corresponds to the data error type. ▶ Replace faulty CRC100.
A61	3011	CRC100 with setting for heating zone 1 incorrectly configured. ▶ If a zone module is installed and recognized, set A.1 = SC (zone controller). ▶ If only one heating zone is installed, set A.1 = CO (controller). ▶ If the controller is not in zone 1, set H.C. to its correct zone.

Fault code	Sub-code	Possible causes and assistance from the contractor
A61 ... A68	3011 ... 3018	CRCx00 with heating zone set to y is missing (A61/3011: heating zone 1, ..., A68/3018: heating zone 8). ▶ Check if the corresponding controller is connected. ▶ Set H.C. on each controller according to its heating zone.
A61 ... A68	3061 ... 3068	CRC100 has no communication with zone module (A61/3061: heating zone 1, ..., A68/3068: heating zone 8). ▶ If only one heating zone is installed, set A.1 = CO (controller). ▶ Otherwise check connection between module and controller.
A61 ... A68	3091 ... 3098	Room temperature sensor of the CRC100 defective (A61/3091: heating zone 1, ..., A68/3098: heating zone 8). ▶ Replace faulty CRC100.
Fill	-	The operating pressure of the heating system is too low. ▶ Add water to heating system through fast fill device (Please refer to the technical documentation of the heat source/boiler. Fault code depends on connected heat source.)

Notes

Notes

Notes

United States and Canada

Bosch Thermotechnology Corp.
50 Wentworth Avenue
Londonderry, NH 03053
Tel. 603-552-1100
Fax 603-965-7581
www.bosch-climate.us
U.S.A.

Products manufactured by
Bosch Thermotechnik GmbH
Junkersstrasse 20-24
D-73249 Wernau
www.bosch-thermotechnology.com

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