

FR 10



BOSCH

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1 Key to symbols and safety instructions

1.1 Key to symbols

Warnings



Warnings in this document are framed and identified by a warning triangle printed against a grey background.



If there is a danger due to electricity, the exclamation mark in the warning triangle is replaced by a lightning flash.

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.

- **NOTE** indicates that material losses may occur.
- **CAUTION** indicates that minor to medium injury may occur.
- **WARNING** indicates that severe injury may occur.
- **DANGER** indicates a risk to life.

Important information



Important information where there is no risk to people or property is indicated with the adjacent symbol. It is bordered by lines above and below the text.

Additional symbols

Symbol	Explanation
▶	Action
→	Cross-reference to other parts of this document or to other documents
•	List/list entry
–	List/list entry (second level)

Table 6

1.2 Safety instructions

- ▶ These instructions must be observed to ensure correct operation.
- ▶ Install and commission the heating appliance and all accessories in accordance with the instructions provided.
- ▶ Accessories must only be installed by suitably qualified installers.
- ▶ Only use these accessories in conjunction with the heating appliances listed. Follow the connection diagram!
- ▶ Never connect this accessory to the 220 to 240 V mains.
- ▶ Before installing this accessory:
Disconnect the power supply (220 to 240 V AC) to the heating appliance and all other BUS subscribers.
- ▶ Do not install this accessory in damp areas.
- ▶ Instruct customers in the functions and operation of this accessory.
- ▶ When there is a risk of frost, leave the heating appliance switched on and follow the frost protection information.

Risk of damage due to operator error

Operator errors can result in injury and damage to property.

- ▶ Ensure that children never operate this appliance unsupervised or play with it.
- ▶ Ensure that only personnel who can operate this appliance correctly have access to it.

2 Technical data for the accessory item



The FR 10 can only be connected to a heating appliance with BUS-enabled Heatronic 3.

- The FR 10 enables the room temperature control of a single heating circuit.
 - According to paragraph 12 of the EnEV (Order governing the energy-saving thermal insulation and energy-saving system technology in buildings in Germany), the FR 10 must only be used in conjunction with a suitable time switch.
 - In systems with a single heating circuit, you can change automatically between the currently selected operating mode ☀ / ☾ / ❄ or heating operation blocked 🚫 using the time program of a time switch.
 - The FR 10 can be used in systems with room temperature controller FR 100/FR 110 to extend the system to up to 10 heating circuits (not permissible in Germany). For further information, see the documentation of FR 100/FR 110.
 - The controller is prepared for wall mounting.
-

2.1 Standard delivery

→ Fig. 2 on page 159:

- 1 Top section, controller and wall mounting base
- 2 Installation and operating instructions

2.2 Specification

Dimensions	Fig. 3, Page 160
Rated voltage	10 ... 24 V DC
Rated current	≤ 3.5 mA
Controller output	2-wire BUS
Control range	5 ... 30 °C in steps of 0.5 K
permiss. ambient temperature	0 ... +50 °C
Protection class	III
IP rating	IP20

Table 1

2.3 Supplementary accessories

See also the pricelist.

- **MT 10:** Analogue 1-channel time switch.
- **DT 10:** Digital 1-channel time switch.
- **IPM 1:** Module for controlling one mixed or one non-mixed heating circuit.

2.4 Cleaning

- ▶ If necessary, use a damp cloth to wipe the controller casing. Never use aggressive or corrosive cleaning agents for this.

2.5 Sample system

Sample systems for systems with several heating circuits (not permissible in Germany) are contained in the documentation of the room temperature controller FR 100/FR 110.

3 Installation (for contractors only)



DANGER: Risk of electric shock!

- ▶ Before installing this accessory:
Disconnect the power supply (220 to 240 V AC) to the heating appliance and all other BUS subscribers.

3.1 Installation

The quality of control of the FR 10 is influenced by the installation location.

The installation location (= lead room) must be suitable for controlling the heating system or heating circuit.

- ▶ Select installation location (→ Fig. 3 on page 161).
- ▶ Remove top section from base. (→ Fig. 4 on page 161).



The mounting surface on the wall should be level.

-
- ▶ Fit the base (→ Fig. 5 on page 161).
 - ▶ Make electrical connections (→ Fig. 6 on page 162).
 - ▶ Push on top section.

3.2 Disposal

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

3.3 Electrical connections

- ▶ BUS connection from controller to other BUS subscribers:
Use cables that comply with local regulations and guidelines.

Permissible cable lengths from the BUS-enabled Heatronic 3 to the controller:

Cable length	Cross-section
≤ 80 m	0.40 mm ²
≤ 100 m	0.50 mm ²
≤ 150 m	0.75 mm ²
≤ 200 m	1.00 mm ²
≤ 300 m	1.50 mm ²

Table 2

- ▶ Route all LV leads separately from cables carrying 220 to 240 V or 380 to 415 V to avoid inductive interference (minimum separation 100 mm).
- ▶ In case of external inductive interference, shield the cables. This ensures that the cables are shielded from external interference (e.g. heavy current cables, overhead wires, transformer stations, radio and television set, amateur radio stations, microwave ovens etc).

- ▶ FR 10 e.g. connect to BUS-enabled Heatronic 3 (→ Fig. 6 on page 162).




If the BUS cables feature different cross-sections:

- ▶ Connect the BUS cables via a junction box (A). (→Fig. 7 on page 162).
-



4 Commissioning (installers only)

- ▶ Set the DIP switch on IPM 1 in accordance with the details in the instructions supplied.
- ▶ Switch on the system.

During first commissioning or after a global reset (resetting all adjustments):

- ▶ For systems with one heating circuit:
Acknowledge flashing code **1 HC** by pressing .

-or-

- ▶ If the controller is to regulate a heating circuit HC_{2...10} (not permissible in Germany):
Select corresponding code **2 HC to 10 HC** by turning  and confirm by pressing .




Only one FR 10 can be assigned per heating circuit and per code.

System configuration starts automatically, and after approx. 60 seconds **AC** will be displayed.

5 Operation

Controls (→ Fig. 1 on page 159)

1	Rotary selector  : - Turn = Adjust value - Press = Confirm setting/value
2	Mode key: - Change operating mode - Accessing user level = hold down for approx 3 seconds - Accessing contractor level = Hold down for approx 6 seconds - Return to the higher level

Symbols (→ Fig. 1 on page 159)










23.5°	Current room temperature or required room temperature (if the rotary selector is turned)
	Operating mode High
	Operating mode Low
	Operating mode Frost
	No heating operation available, e.g. heating mode blocked due to time switch (accessory)
	Burner operation

Table 3




Set the flow temperature controller at the boiler to the maximum required flow temperature.


The FR 10 can only regulate the heating system if an operating mode is enabled. In conjunction with a time switch (accessory), the time program automatically changes between the currently selected operating mode  /  /  and heating operation blocked . Frost protection is ensured (→ Chapter 5.6 page 154).


5.1 Changing the operating mode

- ▶ Briefly press **mode** until the required operating mode is displayed.

 = constant **High**

 = constant **Low**





 = constant **Frost**

The set operating mode is only active if heating operation is not blocked .

5.2 Changing the required room temperature















Use this function if you want to change the required room temperature by way of an exception, e.g. for the duration of a party.


-
- ▶ With rotary selector  adjust the **required room temperature** for the current operating mode  /  / .
- During this period, the required room temperature will flash instead of the display showing the current room temperature. The change to the required room temperature will remain in force until the next operating mode change or until the power is interrupted. At that point the system reverts to the room temperature programmed at the user level for that particular operating mode.

5.3 Changing the standard setting of the required room temperature



Use this function if you want to permanently change the required room temperature away from the standard setting.

- ▶ Accessing user level: Hold down **mode** for approx. 3 seconds until **- -** is displayed.
- ▶ Release the **mode** key and turn  until the required parameter is shown:
 - **1A p** = Required room temperature for  **High**
 - **1b p** = Required room temperature for  **Low**
 - **1C p** = Required room temperature for  **Frost**
- ▶ Briefly press : The current temperature for the previously selected parameter will be displayed.
- ▶ Briefly press : The current temperature flashes.
- ▶ Turn  to adjust the required room temperature:
 -  **High** = maximum temperature required (e.g. if people are spending time in the living areas and require a comfortable temperature). Setting range is higher than  **Low** up to 30 °C.
 -  **Low** = average temperature required (e.g. if a lower room temperature is sufficient or if everyone is out or asleep and the building must not cool down too much). Setting range is higher than  **Frost** and lower than  **High**.

- ❄️ **Frost** = minimum required temperature (e.g. if everyone is away or asleep and the house should not cool down excessively). Consider any pets and plants. Setting range is lower than ☾ **Low** down to a minimum of 5 °C.
- ▶ Briefly press  to save the value.
- ▶ Press **mode** until the current room temperature is displayed.

5.4 Adjusting the contractor level (contractors only)



The contractor level is the exclusive domain of contractors.

- ▶ Accessing contractor level: Hold down **mode** for approx. 6 seconds until - - - is displayed.
- ▶ Release the **mode** key and turn \ominus^+ until the required parameter is shown:
 - **5A p** = Code
 - **5b p** = Heating circuit configuration
 - **6A p** = Calibrate the integral room temperature sensor
 - **6b p** = Calibration factor I
 - **6C p** = Amplification factor V
 - **6d p** = Maximum flow temperature
 - **6E p** = Mixer runtime
- ▶ Briefly press \ominus^+ : The current value for the previously selected parameter is displayed.
- ▶ Briefly press \ominus^+ : The current value flashes.
- ▶ Turn \ominus^+ to select the required value.
- ▶ Briefly press \ominus^+ to save the value.
- ▶ Press **mode** until the current room temperature is displayed.

5.4.1 Changing the code (parameter: 5A p)

Setting range: **1** to **10**

Use this parameter if you want to adjust the code after commissioning:

- ▶ For systems with a single heating circuit: Select code **1**.

-or-

- ▶ If the controller is to regulate a heating circuit HK_{2...10} (not permissible in Germany):
Set the corresponding code **2** to **10**.



Only one FR 10 can be assigned per heating circuit and per code.

5.4.2 Changing the heating circuit configuration (parameter: 5b p)

Setting range: **1** to **3**

Use this parameter if you want to alter the configuration after commissioning:

- ▶ Adjusting the corresponding configuration:
 - **1** = unmixed heating circuit without IPM
 - **2** = unmixed heating circuit with IPM
 - **3** = mixed heating circuit

5.4.3 Calibrating the room temperature sensor (parameter: 6A p)

Setting range: **- 3.0 °C (K)** to **+3.0 °C (K)**

Use this parameter if you want to correct the displayed room temperature.

- ▶ Position a precision instrument near FR 10. The precision instrument must not transfer any heat to the FR 10.
- ▶ Keep away heat sources such as sunlight, body heat, etc. for 1 hour.
- ▶ Calibrate the displayed room temperature correction value.

5.4.4 Selecting calibration factor I (parameter: 6b p)

Setting range: **0 %** to **100 %**

Calibration factor I represents the speed with which the constant control deviation of the room temperature is compensated.

- ▶ Selecting calibration factor I:
 - **≤ 40 %**: Set a lower factor to achieve minimal room temperature overshoot by more gradual correction.
 - **≥ 40 %**: Set a higher factor to achieve faster correction by a greater room temperature overshoot.

5.4.5 Setting the amplification factor V (parameter: 6C p)

Setting range: **40 %** to **100 %**

The amplification factor V influences the heat demand, subject to changes in room temperature.

- ▶ Selecting amplification factor V:
 - **≤ 50 %**: Set a lower factor to reduce the influence on the heat demand. The selected room temperature is achieved after a longer time with only little overshoot.
 - **≥ 50 %**: Set a higher factor to increase the influence on the heat demand. The selected room temperature is achieved quickly with a tendency towards overshooting.

5.4.6 Selecting the maximum flow temperature (parameter: 6d p)

Setting range: **30 °C** to **85 °C**

- ▶ Select the maximum flow temperature to suit the heating circuit.

5.4.7 Setting the mixer runtime (parameter: 6E p)


Setting range: **10 s** to **600 s**

- ▶ Set the mixer runtime to the runtime of the mixer servomotor used.

5.4.8 Resetting all adjustments



This function returns all controller settings and adjustments to their standard settings! Following such a reset, your contractor will need to re-commission the controller.

- ▶ Hold down  and **mode** simultaneously for 15 seconds until the countdown has finished.
-

5.5 Adjusting a heating program

- ▶ Set a heating program with start and stop switching times at the time switch (→ time switch operating instructions).
-

5.6 Frost protection

The heating (circuit pump) starts if the room temperature in the lead room falls below 4 °C or the flow temperature falls below 8 °C. The heating system (pump) is started and stopped accordingly to maintain the room temperature of 4 °C or the flow temperature of 8 °C.

6 Troubleshooting

If the boiler has developed a fault, the display will show, for example, **EA. E**. Here, **EA** means a boiler fault; the full stop . means an external fault; **E** means error (= fault).

If the FR 10 develops a fault, the display shows **03 E** for example.

Here, **(03)** stands for the fault number on the FR 10 and **(E)** for error (= fault):

- ▶ Contact your installer.

If several faults are active, the fault with the highest priority is displayed.

Display	Cause	Remedy (by contractor)
01 E	Heating appliance no longer logged on.	Check codes and connection of BUS subscribers.
	Incorrect BUS subscriber connected.	Replace incorrect BUS subscriber.
02 E	Internal fault.	Replace FR 10.
03 E	Temperature sensor in FR 10 faulty.	Replace FR 10.
11 E	New BUS subscriber recognised.	Check and adjust configuration.
12 E	BUS subscriber IPM missing.	Check codes and connection of BUS subscribers.
13 E	BUS subscriber changed or replaced.	Check and adjust configuration, codes and connections.
14 E	Inadmissible BUS subscriber connected.	Remove inadmissible BUS subscriber.
AE. E ...	Heating appliance fault.	Remedy the fault in accordance with the details in the heating appliance documentation.

Table 4

Problem	Cause	Remedy
Required room temperature is not achieved.	Thermostatic valve(s) in the lead room not open wide enough.	Fully open the thermostatic valve(s) or ask your contractor to replace them with manual valves.
	Flow temperature controller on the heating appliance set too low.	Set the flow temperature controller higher.
	Air lock in the heating system.	Bleed radiators and vent the heating system.
Required room temperature is greatly exceeded.	Installation site of FR 10 unfavourable, e.g. external wall, close to window, in a draft etc.	Select a more suitable installation location (→ chapter 3.1) and ask your heating contractor to move the FR 10.
Excessive room temperature fluctuations.	Temporary influence of external heat on the room, e.g. through insolation, lighting, TV, fireplace etc.	Select a more suitable installation location (→ chapter 3.1) and ask your heating contractor to move the FR 10.

Table 5

Problem	Cause	Remedy
Temperature rises instead of falling.	Time incorrectly set at the time switch (accessory).	Check time setting.
Room temperature excessively high during OFF period.	The building retains a lot of heat.	Select an earlier stop time on the time switch (accessory).
Incorrect or nocontrol.	BUS connection or BUS subscriber faulty.	Ask your contractor to check the BUS connection and correct if required, in accordance with the connection diagram.

Table 5

If the fault persists:

- ▶ Call the authorised contractor or customer service and inform them of the fault, quoting the appliance details (from the type plate).

Appliance details

Type:

.....

Part number:

.....

Date of manufacture (FD...):

.....

7 Energy saving tips

- The temperature in the lead room (where the controller is fitted) acts as lead size for the heating circuit to which the controller is assigned. Therefore, set the output of the radiators inside the lead room as low as possible:
 - For **manual valves** via preselection.
 - With fully opened **thermostatic valves** via the return fitting. If the thermostatic valves in the lead room are not fully open, they may possibly reduce the heat flow even though the controller calls for heat.
- Regulate the temperature in adjacent rooms via thermostatic valves.
- External heat in the lead room (e.g. insolation, stove etc.) can result in too little heating in adjacent rooms (the heating system remains cold).
- Much energy can be saved by reducing the room temperature via economy phases. Reducing the room temperature by 1 K (°C) enables up to 5% energy to be saved. It is not recommended to let the room temperature of heated rooms fall below +15 °C during the daytime, otherwise the cooled-down walls continue to radiate cold and the room temperature rises higher, leading to higher energy consumption than if an even heat supply is applied.
- Good thermal insulation of the building: the set temperature for ☾ **Low** or ❄ **Frost** is not reached. Nevertheless energy is being saved as the heating system stays off. In that case, switch sooner to the lower operating mode.
- Don't keep windows slightly open for ventilation. This leads to

a constant extraction of heat from the room without noticeably improving the ambient air in the room.

- Vent briefly but intensively (open window fully).
- While venting, close thermostatic valve or switch to **Frost** mode.

8 Environmental protection

Environmental protection is a fundamental corporate strategy of the Bosch Group.

The quality of our products, their economy and environmental safety are all of equal importance to us and all environmental protection legislation and regulations are strictly observed.

We use the best possible technology and materials for protecting the environment taking account of economic considerations.

Packaging

Where packaging is concerned, we participate in country-specific recycling processes that ensure optimum recycling.

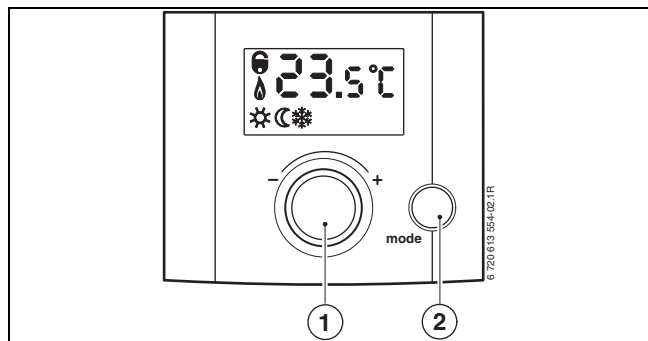
All packaging materials are environmentally compatible and can be recycled.

Old appliances

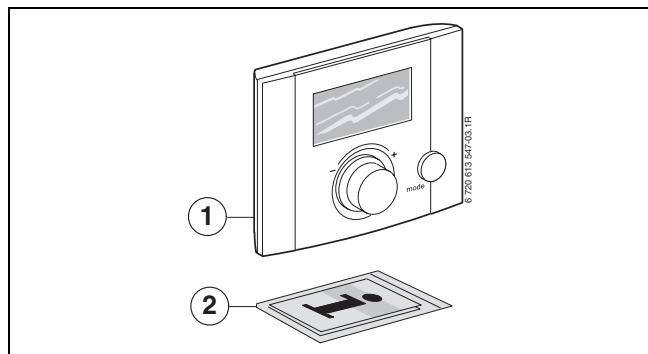
Old appliances contain materials that should be recycled.

The components are easy to separate and the types of plastic used are identified. This allows the various assemblies to be sorted for recycling or disposal.

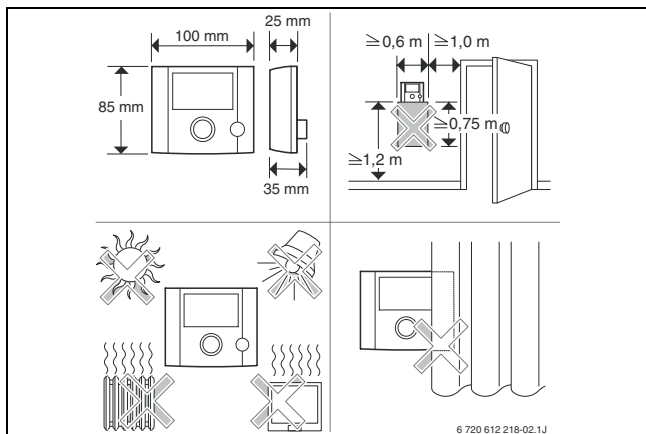
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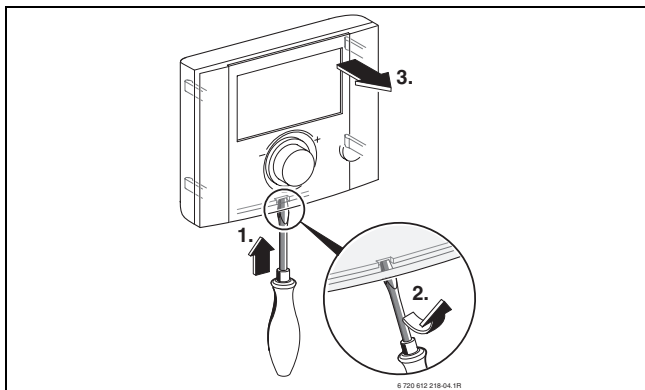
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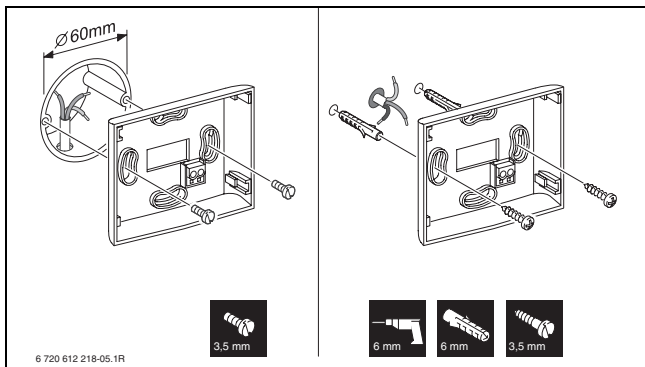
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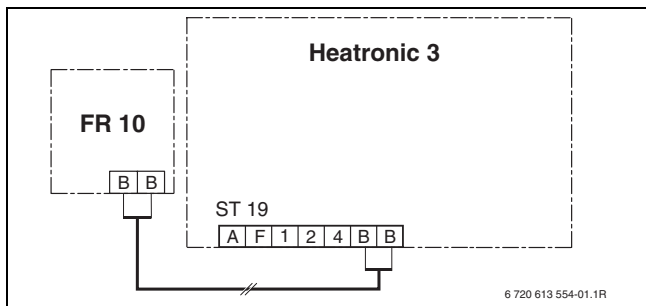
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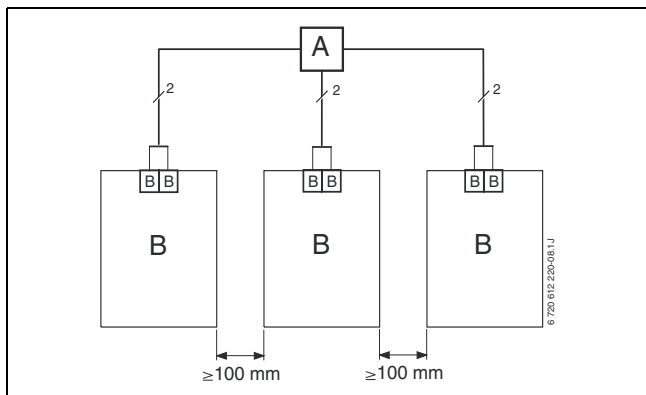
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5



6



7

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