EN

Digital timer thermosatat

Modulating clock thermostat

Installation and Service Manual

123189-AB

De Dietrich

Contents

1 Preface

1.1 General

The modulating clock thermostat is a thermostat with many enhanced functions.

The controller is supplied in a OpenTherm and RF variant:

- OpenTherm thermostat.
- OpenTherm thermostat and RF thermostat (Wireless). With the base station RF.

This installation and service manual describes all the functions of the thermostat. (OpenTherm) (RF).

2 Location of the installation

2.1 Position of the regulator

Controller OpenTherm and controller RF

The controller is set to room control by default. The controller can be installed on an inside wall or in a boiler, if the boiler is suitable for this. This means that the inside temperature is used to control the central heating. It is therefore best to locate the controller on an internal wall in the room in which you spend the most time, such as the living room.

For Germany: The controller is set to weather-compensated control by default.

Only controller RF

The following also applies for the controller RF:

- Position the controller at least 1 metres from equipment with electromagnetic emissions (Washing machines, dryers, cordless telephones, televisions, computers, microwave ovens etc).
- Position the controller so that it has good reception.

Take account of the fact that objects containing metal will affect the reception. These include steel-reinforced concrete, mirrors and windows with a metal coating, insulation films, etc.

CAUTION

Wireless range of controller RF

The range of the controller RF in buildings is generally 30 metres.

Note!

This value is purely an indication! The actual range of the RF signal depends heavily on the local environment. Remember that the number of walls and ceilings (regardless of whether they contain metal or not) can have a considerable impact on reception. Other objects that contain metal may also impact the reception.

These include steel-reinforced concrete, mirrors and windows with a metal coating, insulation films, etc.

The signal strength can be viewed via **Menu > Information**.

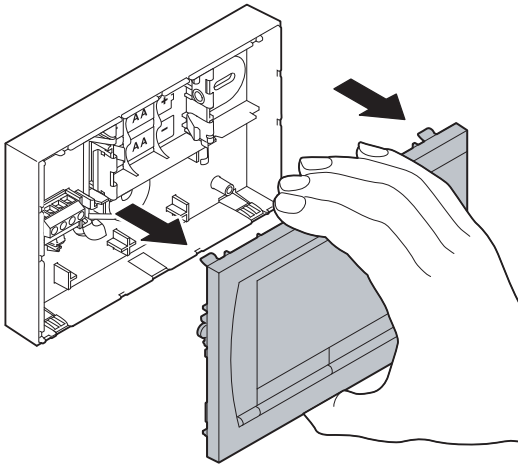
2.2 Installation and connection

Before you can connect the controller, you must first:

- Adjust the boiler so that it can be connected to a OpenTherm controller. See the installation and service manual for the boiler.
- Shut down the boiler.

To do this, proceed as follows:

1. Open the housing by pulling the front and the base plate apart.



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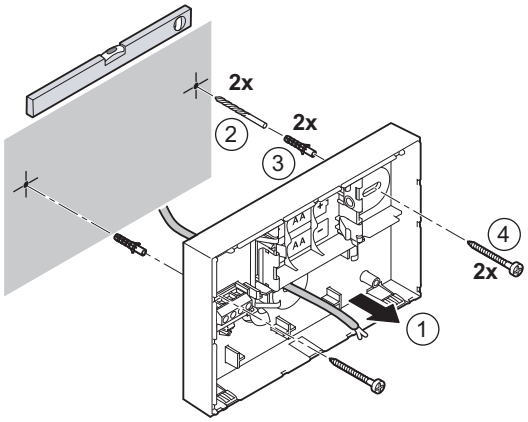
2. Attach the base plate to the wall using the screws and plugs supplied. Ensure that the OpenTherm connecting wires for the boiler are poking through the hole in the base plate.



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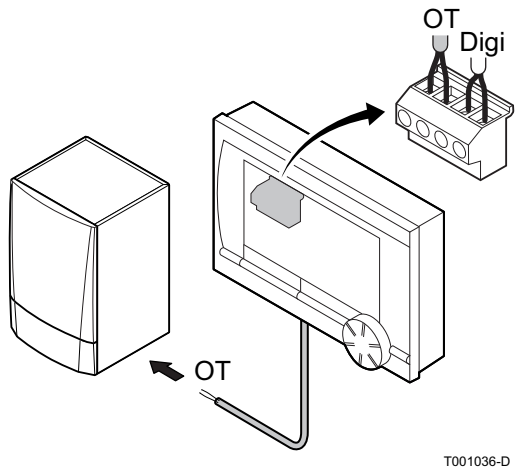
3. **(Only controller OpenTherm)** Connect the controller to the OpenTherm connection of the boiler, and to the OT connection of the controller. OpenTherm is not sensitive to polarity. The wires are interchangeable.



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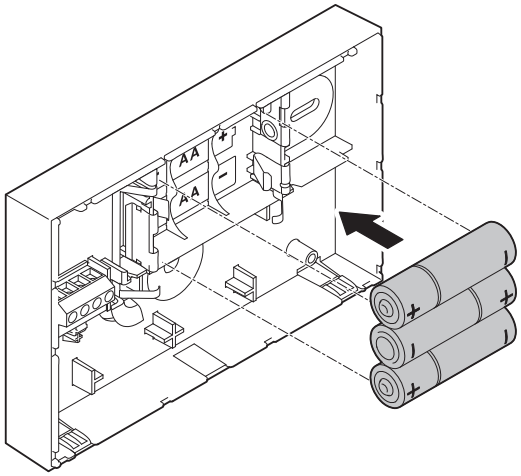


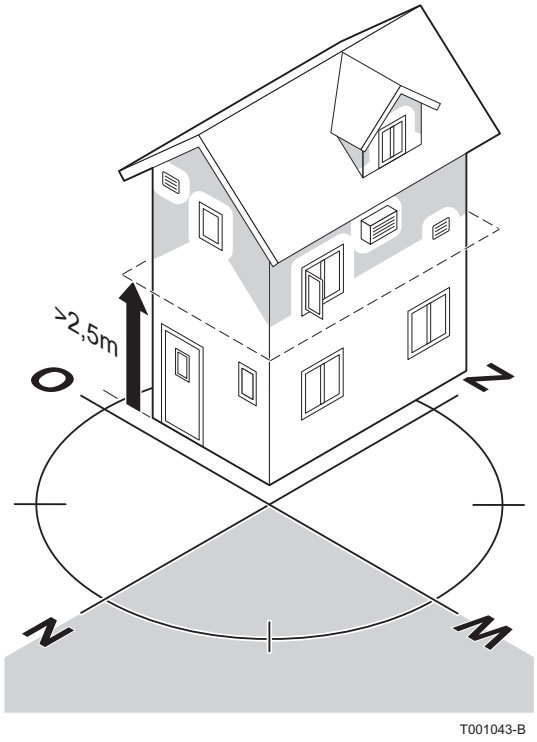
4. **(Only controller OpenTherm)** Place 3 AA batteries in the controller if necessary. These are not supplied. The batteries ensure that the clock keeps running when the boiler is switched off. The batteries also power the backlights of controllers for boilers that do not have OpenTherm Smart Power. If you have a boiler with Smart Power, then the backlight of the controller also works without batteries.

(Only controller RF) Insert 3 AA batteries into the controller. These are required to operate the controller RF.

The set programs will be retained if the boiler or controller is switched off (Even if no batteries are inserted).

The controller is now connected and ready for use. The base station must now be fitted for the controller RF. Consult the base station manual for this.

2.3 Location of the outside sensor



An outside temperature sensor is not supplied as standard with the controller. You only require this sensor if you want weather-compensated control of the inside temperature.

The following guidelines apply with regard to choosing a location for an outside temperature sensor:

- Install the outside sensor on the north or north-west side of the home, away from direct sunlight.
- The sensor must be positioned at least 2,5 metres above ground level.
- Do not install the outside temperature sensor next to a window, door, vent etc

Consult the documentation for your boiler for information on connecting an outside temperature sensor.

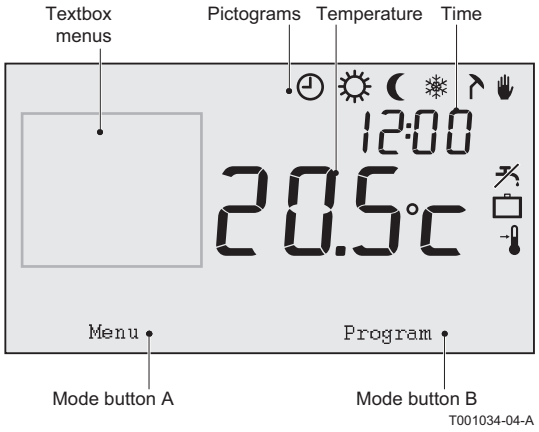
2.4 Room sensor

(Only controller RF)

A RF room sensor is optionally available for a controller RF. This sensor replaces the internal controller sensor.

3 Start-up

3.1 Fitted control unit



3.1.1. Meaning of the symbols on the display

Pictograms

- Clock program active
- Clock program A active
- Clock program B active
- Continuous day temperature
- Continuous night temperature
- Frost protection
- Summer mode
- Manual setting
- Vacation program
- DHW standby function switched off
- Set temperature
- Measured temperature
- Outside temperature measured
- Heating System

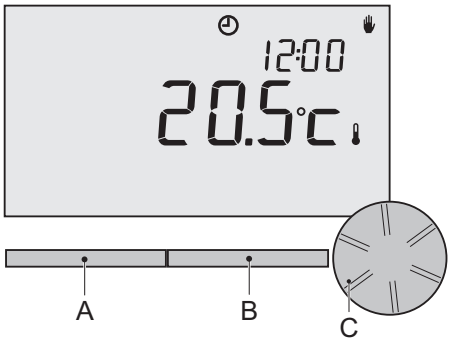
Pictograms not shown

- Controller requesting heat
- Central heating boiler on for hot water
- Central heating boiler on for central heating
- Button locking enabled
- Group 1 selected
- Group 2 selected
- Electricity production

Warning symbols

- Check the water pressure in the installation
- Boiler service required
- Battery in controller almost empty
- General warning symbol
- No wireless connection

3.1.2. Functions of the keys



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The controller is menu-controlled, which means it is very simple to operate.

It only has three buttons.

- The function of button A and button B depends on the task you are carrying out.
- The function is shown in the display immediately above the buttons.
- Button C is a push-turn button.
- You press it to confirm choices (Such as menu selections).
- By turning it you can perform various tasks such as scrolling through menus or changing values such as (Temperature Time Date Language).

3.2 Setting language, time and date

When you connect the controller, the language selection menu appears.

1. Select the desired language by pressing button C, and then press button C to confirm.
2. Follow the instructions on the display to select the time, year, month and day.

The controller is now connected and ready for use. The default clock program is activated after installation. "Default setting", page 9

The temperature is now controlled by this clock program.

The controller automatically switches between summer and winter time.

3.3 Default setting

The controller is set to room control by default (Central heating is controlled on the basis of the inside temperature). Weather-compensated control of the boiler is also possible (on the basis of the outside temperature).

Programme schedule

The default clock program sets the temperature daily as follows:

- 06.00 - 19.00: 20°C
- 19.00 - 23.00: 21°C
- 23.00 - 06.00: 15°C +

You can of course adapt the clock programs to your own requirements. "Defining or modifying a timer program", page 11

4 Setting

4.1 Changing the settings

4.1.1. Defining or modifying a timer program

Time	MO	TU	WE	TH	FR	SA	SU
7:00	20°C	20°C	20°C	20°C	20°C		
9:00	15°C	15°C		15°C	15°C	20°C	20°C
11:00							
13:00							
15:00						15°C	
17:00							
19:00	21°C		21°C	21°C	21°C	21°C	
21:00		21°C					
23:00	15°C	15°C	15°C				15°C
0:00				15°C	15°C	15°C	

The timing program automatically controls the room temperature on the basis of set time intervals and can be separately regulated for each day of the week. You can adjust the default clock program or enter a completely new program.

The controller starts pre-heating prior to the set time by default. This allows the room to reach the desired temperature at the correct time. To change the pre-heating setting ☞ "Central heating settings", page 20.

Setting the clock program indirectly determines when DHW standby is active ☞ "Controlling the tap water temperature", page 18.

Summary table

It is useful to draw up your own overview with switch times (What temperature does it need to be and when in your home ?).

This of course depends on who is at home and when, and what time you get up, etc. You can set 6 switch times per day. See the table on this page.

Creating a new clock program

1. Select in the controller: **Menu > Program > Clock prog. > New**.
2. Select an initial program if appropriate (Home in daytime, Home midweek or Home at weekends). You can now create your own clock program based on this program. Press button C to confirm.
3. Go to the day you want to set the clock program for. Press button C to confirm.

4. Go to the time you want to set. Press button C to confirm

You can use the **Remove** button to remove the selected switch time.

5. Use button C to set the time and the corresponding desired temperature.
6. Once you have set all switch times for a particular day, you can copy the settings for that day to other days:
   - Go to the day.
   - Press **Copy**
   - Use button C to select the day(s) you want to copy the settings to, and press **Save**
7. Go to the day. Then press button C.
8. Go to step 3 to set the next day. Or press **Back** to close this menu.

Changing an existing clock program

1. Select in the controller: **Menu > Program > Clock prog. > Change.**
2. Go to the day you want to change the clock program for. Press button C to confirm.
3. Go to the time you want to change. Press button C to confirm.

You can use the **Remove** button to remove the selected switch time.

4. Use button C to set the time and the corresponding desired temperature.
5. Once you have set all switch times for a particular day, you can copy the settings for that day to other days:
   - Go to the day.
   - Press **Copy**
   - Use button C to select the day(s) you want to copy the settings to, and press **Save**
6. Go to the day. Then press button C.
7. Go to step 2 to set the next day. Or press **Back** to close this menu.

Restoring the default settings

Proceed as follows to restore the settings for the default clock program:

Menu > Program > Clock prog. > Factory program.

4.1.2. Setting continuous temperatures

Instead of the clock program, you can also set the room temperature continuously to a particular value. You can set three different continuous temperatures via: **Menu > Program**

- **Day temp.:** room temperature during the day, corresponding to the: **Continuous day program**.
- **Night temp.**: Room temperature at night, corresponding to the: **Continuous night program**.
- **Frost temp.**: Room temperature to protect the room where the controller is installed from freezing. This setting comes under the program: **Frost**. For further information "Frost protection - System", page 21.

The **Night temp** setting is also used in combination with the functions Day temperature limit, Night temperature limit "Specific settings for weather-compensated control", page 24 DHW standby function "Controlling the tap water temperature", page 18.
If the set room temperature is below the value set at Night temp., Then the DHW standby function is switched off by default. "Controlling the tap water temperature", page 18

4.1.3. Setting the holiday mode

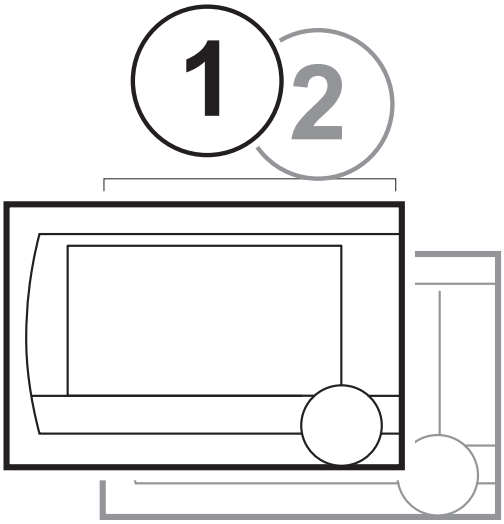
It can be useful to set a holiday program if you are away from home for some time. This ensures a constant temperature in your home for the period you set. You set the temperature yourself.

A holiday program automatically takes effect from 0:00 hours on the start date. And ends at the start of the end date.

The symbol appears on the display. This program is switched off and removed once the set period has ended.You can set a maximum of 16 holiday programs. You do this via: **Menu > Program > Holiday prog.:**

- Select **View** to look at the set holiday programs.
- Select **Change** to change or remove programs.
- Select **Enter** to add a new program.
- Select **Desired temp** to set the desired constant temperature.

4.1.4. Group control



Using the c-Mix, the controller can control 2 groups. Both groups can have their own program selection and control strategy. You do this via: **Menu > Settings > System > CH system > Zoning**

The default setting is **No groups**. The option **1&2 separately** can be used to assign each group its own program. The symbol appears in the standard display. Pressing the push-turn button allows you to switch between the operation of group 1 and 2. If **2 follows 1** is selected, both groups are assigned their own control strategy, but group 2 will follow the program for group 1.

4.2 Operating the controller

4.2.1. Selecting a program

You can select one of the following programs via **Program** in the main display:

- **Clock prog.**: The central heating temperature is controlled by the program you have set.
- **Continuous day program**: The temperature remains constant at the day temperature you have set.
- **Continuous night program**: The temperature remains constant at the night temperature you have set.
- **Frost**: The temperature remains constant at the frost protection temperature you have set. DHW standby is switched off for this program.
- **Continuous summer**: The temperature remains constant at the night temperature you have set. Whereby the tap water is on standby between 06:00 and 23:00. (which means that you will get hot water more quickly).

For DHW standby ☞ "Controlling the tap water temperature", page 18

4.2.2. Temporarily changing the temperature

You can temporarily switch off a selected clock program or continuous program at any time by setting the temperature manually.

1. Turn button C from the main display to set a new temperature.
2. Press **Adjust time** if you want to set an end time for the manually selected temperature. Select this time using push-turn button C.
3. Press **Adjust date** if you want to set an end date for the manually selected temperature. Select this date using push-turn button C.
4. Press button C to return to the main menu. Or alternatively wait 5 seconds until the controller automatically returns to the main menu.

If you do not select an end time and a clock program was active, that clock program will become active again at the next switch point. Manual operation will then be switched off.

Press the **Next program** button to cancel the manual temperature change.

4.2.3. Fireplace mode

Once the temperature has reached the desired level in the room where the controller is located, the central heating switches off. This may be inconvenient if you have an open fire. Or if a lot of people are present. Other rooms in the house are also no longer heated in this situation.

In order to ensure other rooms are still heated, you can switch on the fireplace mode. You do this via the **Program** button.

This switches off the built-in room sensor in the controller. The temperature of the central heating water at that point is then maintained. If it becomes too cold or too hot in the other rooms, you can increase or decrease the room temperature there using push-turn button C on the controller. This increases or decreases the central heating water temperature.You can fit thermostat valves to the radiators in order to control the temperatures individually in these rooms.

Fireplace mode should only be activated if the controller uses the room temperature to control the temperature.

To prevent the temperature in the room where the controller is located becoming too high. It is recommended that you close the radiator valves there.

The controller switches to weather-compensated control if the outside temperature sensor is used.

4.2.4. Information

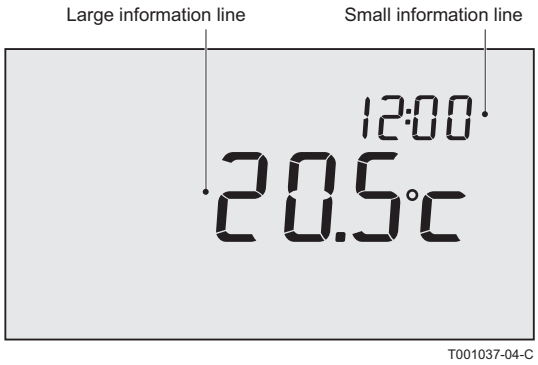
You can request operating information about your central heating system via: **Menu > Information**. Such as the water pressure in the central heating system and various temperatures.

The information available depends on your central heating unit. The **Basic** and **Normal** modes do not show all information categories which are available. Select **More information** to make all information available.

4.2.5. Groups

When the controller is set to control 2 groups separately, a ⌂ icon is displayed on the standard screen. The number in the icon shows which group is selected for control. The group can be changed by pressing button C once.

4.3 Changing usage settings



4.3.1. Setting the display

Set the following via: **Menu > Settings > Users > Display**

- **Info line small:** Select what information should be displayed on the small information line**.**
- **Info line large:** Select what information should be displayed on the large information line.
- **Light time-out:** Set how many seconds the backlight should remain on after the last button is touched.

4.3.2. Setting button locking

Button locking ensures that the buttons are locked if the controller has not been used for 30 seconds.

You can set button locking, with or without a PIN code, via: **Menu > Settings > Users > Key lock**

- **Off:** Button locking disabled.
- **On:** Button locking enabled. Button locking can be enabled again by pressing button C2 time.
- **On + pin code:** Button locking is enabled and can be disabled with the PIN code you enter here.

You can always disable button locking with 0012.

4.3.3. Setting the language

If you have the international version of the controller, you can set the language for the menus via: **Menu > Settings > Users > Language**.

4.3.4. Setting the user level

You can select the user level via: **Menu > Settings > Users > User mode**.

- **Basic mode**: In this mode, you can not use any clock programs. You can only set the temperature on the controller manually.
- **Normal mode**: This is the default setting. Most options are available, such as the clock program.
- **Extended mode**: In this mode, you can use two standard clock programs, A and B. You can also change more settings and request more detailed information.

Some settings can only be changed in the mode **Extended mode**. The settings you create remain enabled in the modes **Basic mode** and **Normal mode**.

4.3.5. Resetting factory settings

You can reset all settings, including the clock program, to the works setting via: **Menu > Settings > Users > Reset**

4.3.6. Calibration

You can adjust the measuring value from the inside and outside sensors via: **Menu > Settings > Users > Calibration.** This can be useful if the measured temperatures do not correspond to what you are used to.

Imagine that the measured temperature is 0,5°C higher than what you are used to. You can then enter an adjustment here of -0,5°C.

4.3.7. Restoring a connection with the base station (Only controller RF)

When the controller RF or the base station is replaced, you must restore the connection. To do this, proceed as follows:

1. Put the base station in connection mode. Consult the base station manual for this.
2. Select in the controller: **Menu > Settings > Users > Connection > Base station.**

After a few seconds, the connection is restored.

4.3.8. Connecting extra RF sensors (Only controller RF)

1. Set the RF sensor to be connected to connection mode. (Refer to the documentation for the relevant sensor).
2. In controller RF, select: **Menu > Settings > Users > Connection.** Select the correct sensor and press connect. After a few seconds, the connection is restored.

4.3.9. Setting the time and date

Set the correct date and time as follows: **Menu > Settings > Date/ time.**

- **Set time**
- **Set date**
- **Summer time:**

Europe: The controller automatically switches between summer and winter time.

Other: You can set the start and end of summer time yourself by indicating the month and the week. The time will change on the Sunday.

Manual: The controller does not switch between summer and winter time. The time must be changed manually.

4.3.10. Comfort correction

It feels more comfortable when the radiators in the home are hot (Between 50°C and 90°C).The perceived temperature is higher than the real temperature due to the radiant heat. Comfort correction ensures that the central heating does not heat to a temperature that is higher than the desired perceived temperature.

For example: The desired temperature is 21℃. The radiant heat from the radiators means that 20,7℃ feels like 21℃. Comfort correction ensures that the central heating does not carry on heating once the temperature has reached 20,7℃.

Change the comfort correction via: **Menu > Settings > System > Temperature > Comfort corr.**

Comfort correction is enabled by default.

4.3.11. Legionella function

The tap water can be heated to 65℃ once a week to prevent legionella in your boiler. This measure can be used for external boilers if necessary. This option is not available for combi-boilers.

When this setting is enabled, tap water is heated by default on Mondays at 02:00.

You can change the setting via: **Menu > Settings > DHW > Anti-Legionella**

To ensure this function works correctly, check whether any settings have to be changed on the boiler.

The boiler must allow an increased tap water temperature.

4.3.12. Controlling the tap water temperature

You can set if and when the temperature of the tap water can be lowered, in order to save energy. This can occur at night, for example, when the demand for hot tap water is lower. The controller has two settings for this:

- **Standby**
- **DHW temperature**

- Both functions are active simultaneously.
- The icon is shown in the display when DHW standby is switched off.

Time	Desired room temperature
07:00	20°C
09:00	15°C
11:00	
13:00	
15:00	
17:00	
19:00	21°C
21:00	
23:00	15°C
00:00	

DHW standby

The combi-boiler pre-heats periodically in order to be able to meet the demand for hot tap water quickly. You can set this option via:

Menu > Settings > DHW > Standby

You can choose from the following options:

- **Continuous off:** The combi-boiler does not keep itself hot. Select this option for maximum energy saving.
- **Continuous on:** The combi-boiler keeps itself hot continuously. Select this option for optimum comfort.
- **Night temp off** (appears on the display): The boiler is not pre-heated if the desired room temperature is the same as or lower than the night temperature, which is set via: **Menu > Program > Night temp.** For example: If the **Night temp** setting is on 15°C, for example, the tap water will not be kept hot for certain periods.

Select the **Night off** option for energy saving during the night.

Boilers respond differently to this function. Some do provide hot water, but take longer to get up to temperature. Others only provide the heat that is still present. For example in a boiler, and the water subsequently becomes cold.

See the installation and service manual for the boiler.

Domestic water temperature

1. Select in the controller: **Menu > Settings > DHW > DHW temperature**
2. You can choose from the following options:

- **Temperature:** Select the temperature that the hot tap water must have continuously.

- **Clock prog.:** Use a clock program to determine the temperature of the tap water. Setting this clock program is virtually identical to setting a clock program for the desired room temperature. "Defining or modifying a timer program", page 11.

The maximum temperature that can be set depends on the boiler settings.

When setting a clock program, start this an hour before you require the first hot water. This gives the boiler sufficient time to heat up.

4.3.13. Central heating settings

You can set a number of specific central heating settings via: **Menu > Settings > System > CH system:**

- **Pump control:** When this option is switched on, the pump switches off when there is no demand for hot water. This means the pump runs for less time (saving electricity). As the pump is off if the boiler is not on, it may take a few minutes for a radiator to actually fill with hot water when you turn it on.
- **Heating rate:** This allows you to determine how quickly or slowly the controller responds. This parameter affects the pre-heating and the control response.

Set this to **Slowest** for underfloor heating.

For the eVita, we recommend the setting **Extra Slow**.

- **Cooling rate:** This allows you to indicate how quickly the home cools or how well your home is insulated. The better the insulation, the slower the home cools down. This parameter affects the control strategies **RTC** and **OTC+comfort**. And the off-periods between the burner coming on.

Cooling rate > Slowest: Gives long off-periods between the burner coming on.

Cooling rate > Fastest: Gives short off-periods between the burner coming on.

- **Max. pre-heat:** The maximum time before a switch point that pre-heating can begin (Time in minutes).
- **Min. CH temp.:** Minimum desired temperature of the central heating water. This setting is particularly useful for convectors.
- **Max. CH temp.:** Maximum temperature of the control for the central heating water. This is not the maximum temperature of the boiler.

CAUTION

If this concerns a safety function, this must be set on the boiler.

The engineer installing the controller can set a number of specific settings.

4.3.14. Frost protection - System

You can use the frost protection system option to protect radiators in frost-sensitive rooms against freezing. For example: The temperature in the home at night does not drop below 19°C, which means the pump does not come on. The radiator in the annexe, which gets colder, runs the risk of freezing.

The frost protection system option is automatically switched on if you have an outside sensor. The outside temperature at which this switches on can be set via: **Menu > Settings > System > Temperature > Frost protection.**

This value is set to -10°C by default. The pump then starts at -10.5°C and stops again at -9.5°C

4.3.15. Frost protection - Room

Use "room" frost protection to protect the room where the controller is located from frost. This does not require an outside sensor.

The minimum room temperature for frost protection is set at 6°C. You can change this temperature via: **Menu > Program > Frost temp..**

Activate "room" frost protection via: **Program > Frost.**

Any radiator valves present in the reference room must be fully opened.

5 Selecting the control strategy

5.1 Six control strategies

The controller can be used as a weather compensator or as a room thermostat (Room control). Six control strategies are available for this.

1 RTC: (Modulating control) Room control

The control measures the room temperature in the reference room (the room where the thermostat is located). The required flow temperature based on an intelligent control system is now calculated. The boiler works by modulating. It controls the output on the basis of the flow temperature and return temperature of the water. This allows it to operate as efficiently as possible. With as constant a water temperature as possible.

Room control can be used anywhere. Unless you do not want a single reference room to determine the temperature for all the other rooms.

2 OTC: Control as a function of the temperature

The control measures the outside temperature with an outside temperature sensor. The controller has a programmed heating curve. Based on the outside temperature, the flow temperature is determined with the help of the heating curve.

The heating curve must be chosen so that the least favourable room can be heated efficiently, even when the outside temperatures are very low.

The measured inside temperature does not affect the control of the boiler. The desired inside temperature is only achieved with a correctly programmed heating curve and a correctly designed system.

Normal outside conditions are also important. Direct sunlight or a strong northerly wind mean lower or higher heating requirements respectively. This has no influence on the supply of heat. This is why weather-compensated control alone is insufficient. and adjustments have to be made in each room, using thermostat valves.

3 OTC + RT: Weather-compensated with the effect of the room temperature

The basis of this control strategy is the same as weather-compensated control. The heating curve must therefore be correctly entered. The heating curve is also shifted when the measured room temperature deviates from the desired room temperature. The degree of shift is influenced by the **RT effect** setting. "Specific settings for weather-compensated control", page 24

The advantage of this control is that desired changes in room temperature can be anticipated quickly. The boiler will remain off for longer for desired downward changes in room temperature. This is good for the energy consumption.

Adjustments are not needed in the room where the controller is located. Any radiator valves present in the reference room must be fully opened.

4 OTC + C-RT: Weather-compensated with comfort function

The basis of this control strategy is the same as weather-compensated control. The heating curve must therefore be correctly entered. The heating curve is also shifted on the basis of a room temperature that is calculated (therefore not measured). The outside temperature, the **heat up rate** and the **cooling rate** influence this.

The degree of shift is influenced by the **RT effect** setting. "Specific settings for weather-compensated control", page 24

The advantage of this control is that desired changes in room temperature can be anticipated quickly. Without the controller having to be located in the reference room.

The boiler will remain off for longer for desired downward changes in room temperature. This is good for the energy consumption.

5 OTC/RTC ECO: Weather-compensated with comfort function

The **OTC** control strategy is used where the desired room temperature is higher than the night temperature. Night temperature is set via: **Menu > Program > Night temp.**

The relevant settings must therefore be set. The **RTC** control strategy is used where the desired room temperature is the same as or lower than the **night temperature**.

The controller must then be located in a room which is representative for room temperature measurement during the night. This control strategy prevents the boiler from being switched on unnecessarily during the night.

6 RTC + Limit

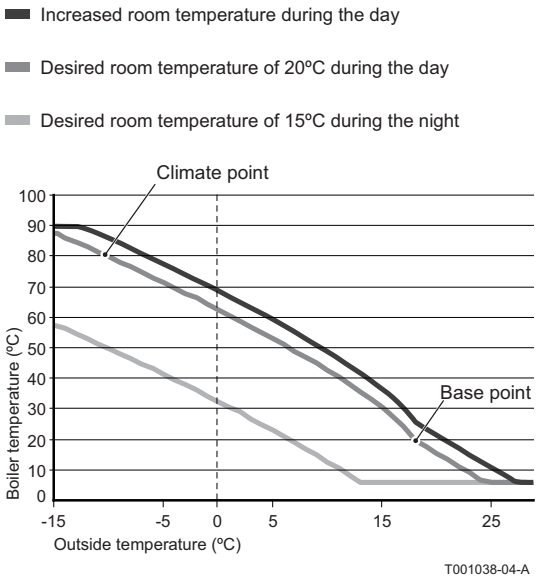
Room control with heating curve as limit. Same as control strategy **1**, but the heating curve is used as max boiler temperature. (External sensor required).

The **RTC** control does not have its full temperature control range available due to the heating curve limit. As a result, it may take longer to heat up.

5.2 Setting the control strategy

The controller lets you use the room control and/or weather-compensated control strategies in various ways. You can select one of the controls, described in paragraph 5.1 via: **Menu > Settings > System > Control settings**.

5.3 Specific settings for weather-compensated control



If you have opted for a weather-compensated control strategy, a number of extra settings are available via: **Menu > Settings > System > OTC settings > Heating curve**

- **Base outside:** Outside temperature base point.
- **Base flowtemp:** Flow temperature base point.
- **Climate outside:** Flow temperature climate point.
- **Curvature:** Degree of curvature of the heating curve, depending on your central heating system. Select the relevant type of heaters: Underfloor heating, radiators or convectors.

The heating curve is based on a desired room temperature of 20°C. By increasing the desired room temperature, the heating curve shifts upwards. The degree of shift is influenced by the **RT effect** setting.

- **RT effect:** Effect of room temperature on the shift in the heating curve.
- **Heat limit day:** Outside temperature above which the central heating is switched off during the day. The day temperature limit is relevant when the desired room temperature is higher than the night temperature which has been set via: **Menu > Program > Night temp.**
- **Heat limit night:** Outside temperature above which the central heating is switched off during the night. The night temperature limit is relevant when the desired room temperature is the same as or lower than the night temperature that has been set via: **Menu > Program > Night temp.**

5.4 Heating curve - For example

The settings for the heating curve are highly dependent on the design of the central heating system and the home. This means that no clear advice can be given on this matter. Use the tables below as a basic setting if you do not know the design information. The heating curve can be optimised during use. The heating curve also shifts upwards or downwards when the temperature is increased or decreased.

Heating by radiators					
	Building insulation				
	Very good	**Good**	**Average**	**Less good**	**Poor**
RT effect	4	5	5	6	6
Base outside	16	17	18	19	20
Base flowtemp	20	20	20	20	20
Climate outside	-10	-10	-10	-10	-10
Climate flowtemp	70	75	80	85	90

Underfloor heating					
	Building insulation				
	Very good	**Good**	**Average**	**Less good**	**Poor**
RT effect	1	2	3	3	4
Base outside	16	17	18	19	20
Base flowtemp	20	20	20	20	20
Climate outside	-10	-10	-10	-10	-10
Climate flowtemp	40	40	40	40	40

Air heating Convectors					
	Building insulation				
	Very good	**Good**	**Average**	**Less good**	**Poor**
RT effect	2	3	3	4	4
Base outside	16	17	18	19	20
Base flowtemp	50	50	50	50	50
Climate outside	-10	-10	-10	-10	-10
Climate flowtemp	70	75	80	85	90

6 Installer settings

6.1 Telephone number for service messages and failure signals

You can enter a telephone number to be shown if the boiler displays a service message or failure signal.

Select: **Menu > Settings > Installer > Phone number > Service or Repair**

No telephone number is shown with the message if no telephone number is entered.

6.2 Service messages on or off

You can set whether service messages from the boiler can be shown on the controller.

Select: **Menu > Settings > Installer > Service report**.

6.3 PIN code for menus for the installer and system

You can protect the **Installer** and **System** menus with a permanent PIN code (0012).

Select: **Menu > Settings > Installer > Service code**. The code remains active for 30 minutes after being entered.

6.4 Digital input

6.4.1. Operation

You can have an external module send a command to the controller. This is done via the digital input. For example: The controller can be ordered to start the day program if a movement detector detects a person.

On the controller OpenTherm the digital input is on the controller next to the OpenTherm connection. On the controller RF, it is on the base station.

WARNING

Do not send any voltage to the digital input.
Only use voltage-free contacts.

1. Select: **Menu > Settings > Installer > DIGI input**.

2. Use **Function** to select the command that the controller has to perform when ordered to by the external module.
   - **Not used:** The digital input is switched off.
   - **Day temp.:** The continuous day program is switched on.
   - **Night temp.:** The continuous night program is switched on.
   - **Service:** A service message is given.
   - **Water pressure**: A warning is given on the display if the water pressure is too low.
3. Select **Contact** to set whether the external module is a contact that is normally open or normally closed. This then lets the controller know when it must perform the command.
4. Select **Time open** or **Time closed** to indicate how many minutes the contact must be open or closed before the controller performs the command. (Depending on the type of contact). You can use this function to combat the effect of "rumbling". Or, for example, to stop the central heating coming on if somebody is only inside for a minute.

If **Time open** or **Time closed** is 0, it may take a moment before a change of digital input is visible on the controller.

6.4.2. Examples

Movement detector

FUNCTION

If the movement detector detects no movement for 30 minutes, the temperature must switch to continuous night temperature. If movement is detected, the controller switches to its normal program.

SETTING

The movement detector closes a relay when there is movement. Set the digital input as follows:

- Mode: Night temp.
- Contact: Normal. Closed
- Time open: **30 minutes**
- Time close: **0 minutes**

low water pressure switch

FUNCTION

If a water pressure switch is connected, then the icon  appears on the display if the water pressure is too low.

SETTING

Connect a water pressure switch to the digital input and set the digital input as follows:

- Mode: Water pressure
- Contact: Normally Open (Water pressure switch closes if the pressure is low) or:
  Contact: Normal. Closed (Water pressure switch opens if the pressure is low).
- Time open: **1 minute**
- Time close: **1 minute**

Door contact

FUNCTION

The temperature switches to continuous night temperature after 3 minutes if the door opens. The controller immediately switches back to its normal program when the door closes.

SETTING

Connect a door contact to the digital input and set the digital input as follows:

- Mode: Night temp.
- Contact: Normal. Closed (When the contact is closed for a closed door).
- Time open: **3 minutes**
- Time close: **1 minute**

Overtime timer

FUNCTION

The temperature immediately switches to continuous day temperature if the timer is activated during the night-time decrease. The controller immediately switches back to its normal program at the end of the timer period.

SETTING

Connect a timer to the digital input and set the digital input as follows:

- Mode: Day temp.
- Contact: Normally Open
- Time open: **0 minutes**
- Time close: **0 minutes**

6.5 Boiler Setting

You can choose a number of specific boiler settings via: **Menu > Settings > Installer > Boiler settings:** After setting code 0012, depending on the boiler, parameters can be changed.

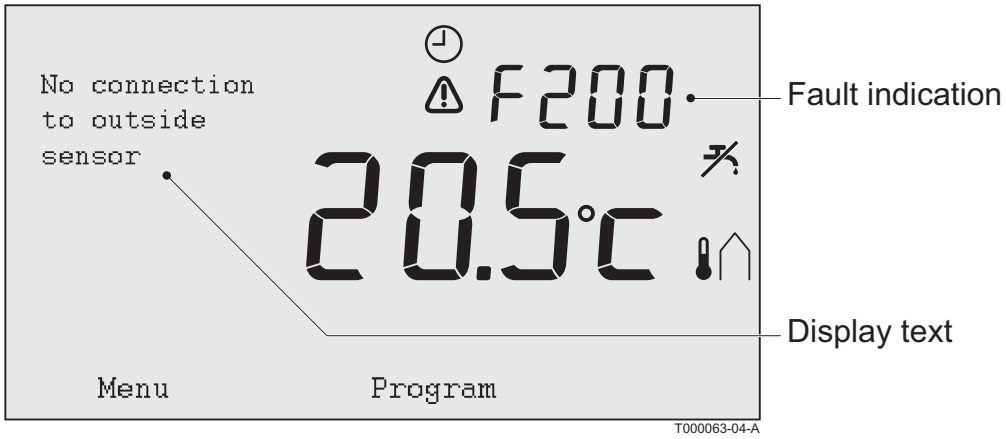
- **Parameters:** Use the boiler manual, when changing the boiler parameters.
- **Restore param.:** Restore the boiler factory default settings, using the dF dU code.
- **Reset service:** Reset the next service call when the service maintenance has been carried out.
- **Start detection:** Start the detection for boiler accessories.

- The values to be read may differ depending on the connected heating unit. See the installation and service manual for the boiler.
- The meaning of the various codes may differ for different boilers.
- After selection of a parameter, it takes 0,5 sec before it is retrieved.

7 Messages

7.1 Error messages

This is what a fault message or service message looks like:



Error codes	Fault indication	Display text	Solution
F200 No connection to outside sensor	⚠ and 🌡 are lit up.	No connection to outside sensor.	Check the boiler's connection to the outside temperature sensor.
F203 Faulty connection to boiler	⚠ is lit up.	Communication error. Check the connection.	Check the connection to the boiler.
F214 Incorrect room temperature reading	⚠ is lit up.	Room temperature is out of measuring range or sensor is defective.	Room temperature measurement is incorrect.The temperature sensor may be defective if the room temperature is between -5°C and 65°C. Contact your installer.
F215 Controller failure	⚠ is lit up.	Internal fault. Controller failure.	Contact your installer.
F216 **F219** No connection with base station (Only controller RF).	📡 and ⚠ are lit up.	Wireless communication fault.	Check whether the base station for the boiler is on and is functioning correctly (Consult the transmitter manual if necessary). If there is no connection between the controller and the base station, restore it as follows: Put the base station in connection mode. (Consult the transmitter manual if necessary). Select in the controller: **Menu > Settings > Users > Connection > Base station > Connect.** If this does not solve the problem, look for another location for the controller and/or the base station. Or remove obstacles that could interfere with the RF signal.
F227 Wait for RF sensor	Wait for RF sensor	Wait for RF sensor information. This may take 15 mins.	This fault code can appear after controller RF starts again (eg after changing the batteries). As soon as controller RF has received a message from the connected RF sensors, the message will disappear. If the RF sensors fail to report, another fault code will be displayed after 15 minutes.

Error codes	Fault indication	Display text	Solution
The water pressure is too low	Current water pressure and are lit up.	The water pressure in your central heating system is too low.	Top up the water in the central heating system. See the installation and service manual for the boiler.
E-Code: Boiler failure	E-Code is lit up.	Boiler failure: See the installation and service manual for the boiler. Or equipment between the controller and boiler.	Use the E code to find the fault in the equipment to be controlled (For example, boiler, cascade controller or c-Mix).
Controller batteries flat	and are lit up	-	The batteries are almost empty. Replace the three AA batteries.

7.2 Maintenance message

Boiler service required	
Fault indication	is lit up.
Display text	Maintenance service type (A,B, or C) required in two months. Make an appointment for this with your installer. Telephone number:
Solution	Contact your installer to have the central heating boiler serviced.

7.3 Incidents and solutions

Problem	Solution
The central heating comes on too early in the morning.	Adjust the **Max pre-heating time** setting. The home may well not be up to temperature on time as a result.
The home is not warm on time.	▸ Open the radiator valve further when the radiators warm up. ▸ Adjust the **Max pre-heating time** setting. ▸ Increase the **Max. pre-heat**. By adjusting this to **Fastest** for example For weather-compensated control you have the following options: ▸ Set the radiator thermostat valves correctly. ▸ Adjust the heating curve (Refer to the installation instruction booklet for further information). ▸ Change the control strategy. There may also be technical problems with the central heating installation. In that case contact your installer.
The house is too warm.	Weather-compensated control means that no account is taken of the room temperature. Solve the problem in one of the following ways: ▸ Set the radiator thermostat valves correctly. ▸ Adjust the heating curve. ▸ Change the control strategy. With room control, the heat-up rate may be too high or the controller may not be correctly calibrated.
The house does not become warm enough.	Weather-compensated control means that no account is taken of the room temperature. Solve the problem in one of the following ways: ▸ Set the radiator thermostat valves correctly. ▸ Increase the heating curve. ▸ Change the control strategy.

Problem	Solution
It takes a long time for the tap water to get up to temperature.	▸ Boiler: It may be that the DHW standby function is switched off. In that case, the symbol is shown in the display. Control the DHW standby function with the **DHW standby** setting ▸ Tank: It may be that the boiler is being heated up too late. Set the tap water temperature with the **Tap water temperature** setting.
The boiler starts heating the home or the tap water at night, even though the controller is set to low.	▸ Weather-compensated control (OTC) means that the boiler is controlled by the outside temperature. This can be prevented by adjusting the **Night temperature** limit or selecting another control strategy ▸ The boiler can start pre-heating before the following set point. Adjust the **Max pre-heating time** setting. The home may well not be up to temperature on time as a result. ▸ The tap water is only heated when the room temperature set is higher than the night temperature
The temperature measurement differs from what I am used to.	Correct the temperature measurement using the **Calibration** setting.
The display does not function.	▸ OpenTherm regulator: Check that the wiring is correct and that the plug for the boiler is securely in the wall socket. ▸ RF regulator: Insert fully charged batteries.
The backlight for the display does not work.	▸ OpenTherm regulator: Your boiler may not support the OpenTherm Smart Power. In that case, insert batteries into the controller. ▸ RF regulator: Insert fully charged batteries.
The boiler supplies no hot water, or water that is barely warm.	It may be that the DHW standby function is switched off. Depending on the type of boiler, this can be the result. Switch the DHW standby function to **Continuously on**.

8 Menu / Technical data

8.1 Menu structure

For user levels **Basic** and **Normal**, some menu items are not visible.
The **Set boiler** menu depends on the options offered by the boiler.

		Menu options		Factory setting	
Program	Clock prog.				
	Clock prog. A				
	Clock prog. B				
	Day temp.			20℃	
	Night temp.			15℃	
	Frost temp.			6℃	
	Holiday prog.				
	Fireplace				
Settings	Users	Display	Info line small	Time	
			Info line large	Act. room temp	
			Light time-out	15seconds	
		Key lock	Off	☑	
			On	☐	
			On + pin code	☐	
		User mode	Basic mode	☐	
			Normal mode	☑	
			Extended mode	☐	
		Reset			
		Calibration	Outside sensor	0.0	
			Inside sensor	0.0	
		Connection	Base station	Connect	
			RF outsidesensor	Connect	
				Disconnect	
			RF room sensor	Connect	
				Disconnect	
Settings	Installer	DIGI input	Mode	Not used	☑
				Day temp.	☐
				Night temp.	☐
				Service	☐
				Water pressure	☐
			Time open	1 min	
			Time close	1 min	
			Contact	Normal. Closed	☑
				Normally Open	☐

		Menu options		Factory setting	
		Remote input	Allow	☑	
			Disallow	☐	
		Phone number	Service	( )	
			Repair	( )	
		Service report	Off	☑	
			On	☐	
		Service code	Off	☑	
			On	☐	
Settings	Installer	Boiler settings	Parameters		
			Restore param.		
			Reset service		
			Start detection		
Settings	System	OTC settings	Heating curve	Base outside	20°C
				Base flowtemp	20°C
				Climate outside	-10°C
				Climate flowtemp	90°C
				Curvature	
			RT effect	5	
			Heat limit day	21°C	
			Heat limit night	10°C	
Settings	System	Control settings	RTC	☑	
			OTC + RT	☐	
			OTC + C-RT	☐	
			OTC/RTC ECO	☐	
			OTC	☐	
			RTC + limit	☐	
		Temperature	Comfort corr.	Off	☐
				On	☑
			Frost protection	-10°C	
Settings	System	CH system	Pump control	Off	☐
				On	☑
			Heating rate	Extra Slow	☑ eVita
				Slowest	☐
				Slower	☐
				Normal	☑
				Faster	☐
				Fastest	☐
			Cooling rate	Slowest	☐
				Slower	☐
				Normal	☑
				Faster	☐
				Fastest	☐
			Max. pre-heat	(180 min)	
			Min. CH temp.	(6°C)	
			Max. CH temp.	(90°C)	
			Zoning	No zoning	☑
				1 & 2 separate	☐
				2 follows 1	☐

		Menu options		Factory setting
Settings	DHW	Anti-Legionella	Activate on...	☐
			Off	☑
		Standby	Continuous off	☐
			Continuous on	☐
			Night temp off	☑
		DHW temperature	Temperature	☑ 60°C
			Clock prog.	☐
Settings	Time/date	Set time		
		Set date		
		Summer time	Europe	☑
			Other	☐
			Manual	☐
Information				

8.2 Technical characteristics

Specifications	
Dimensions	
	96 x 144 x 34 (l x b x h) mm Height excluding buttons 96 x 144 x 25 (l x b x h) mm
Power supply	
OpenTherm regulator	Via OpenTherm or separate 5Vdc adapter
RF regulator	Via batteries or separate 5Vdc adapter
Electrical connection	
OpenTherm regulator	OpenTherm communication. Connection for low-voltage wires
RF regulator	Bi-directional secure communication
Batteries	3 x AA Batteries. Service life: Dependent on the make of battery
Digital input	Volt free contact (Contactor)
Ambient conditions	
Storage conditions	Temperature: -25°C - 60°C
	Relative humidity 5% - 90% no condensation
Operating conditions	Without batteries: 0°C - 60°C . With batteries: 0°C - 55°C
Temperature	
Room temperature	Measurement range: -5°C - 65°C
	Maximum temperature deviation at 20°C : 0,3 °C
Outside temp	The measurement is taken in the boiler and passed to the controller. Consult the boiler documentation regarding the accuracy of the measurement.
Temperature control area	5 - 35°C
Calibration options	Inside and outside temperature sensor: -5 output +5 In steps of 0,5 °C
Adjustment	Modulating temperature control
	The control can be optimised
Room control	Overshoot: Maximum 1°C after pre-heating
	Temperature variation: Less than 0,25°C
Adjustment strategies	Adjustment of the room temperature
	Control as a function of the temperature
	4 Combination options
Features of the controller	
Backlight	Colour: blue
Date/Time indication	Time: 24h Clock. Accuracy: To about 365 seconds per year

Specifications	
	Date: Day - Month - Year.
	Automatic switching to summer time
Programs	2 clock programs with 6 switch points per day
	Boiler clock program with 6 switch points per day
	16 Holiday programs
	Day, Night, Frost protection, Summer mode, Fireplace mode
Control precision	Temperature: 0,5 °C
	Programme schedule: 10 minutes
Wireless range of controller RF	The range of the controller RF in buildings is generally 30 metres. However, this depends to a large extent on the situation "Position of the regulator", page 5
Controls	Controlled from the menu, using push buttons and a push-turn button
Mounting	Directly on the wall using screws. Or built-in junction box as per standards
	Built-in system possible using built-in part (art. S100994)
Quality marks and compliance with standards	EMC: 2004/108/EC - EN50165 (1997), 55014, 55022
	Emission: EN61000-6-3
	Immunity: EN61000-6-2
	Drop test: IEC 68-2-32
	RoHS compliant
	OpenTherm V3.0 Smartpower (Only controller RF)
	ETSI 300-220 (Only controller RF)
Protection classification	For wall installation: IP20 For the built-in system: IPx4

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