

For the heating engineer

Installation instructions



VRC 470f

GB, IE

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1 Notes on the installation instructions

1 Notes on the installation instructions

The following instructions are intended to guide you throughout the entire documentation. Further documents apply in combination with these installation instructions.

We accept no liability for damage caused by failure to observe these instructions.

1.1 Observing other applicable documents

- Always observe all installation instructions for parts and components of the system when installing the VRC 470f controller.

These installation instructions are enclosed with the various system components as well as additional components.

- Also observe all the operating instructions supplied with the system components.

1.2 Document storage

- Pass these installation instructions and all other applicable documents and, if necessary, any required tools to the system operator.

The system operator should retain those instructions and tools so that they are available when required.

1.3 Symbols used

The symbols used in the text are explained below: Symbols for identifying dangers are also used in these operating instructions (→ **Section 2.1.1**).



Symbol that denotes useful tips and information

- Symbol for a required action

1.4 Applicability of the instructions

These installation instructions apply only to appliances with the following article numbers:

Type designation	Article number	Countries
VRC 470f	0020108137	GB, IE

Tab. 1.1 Type designations and article numbers

The 10-digit article number can be found in the serial number of your appliance.

The serial number is displayed when you press the left function key under "Information/Serial number". It is in the second line of the display (→ **Operating instructions**).

1.5 CE label

CE labelling shows that, based on the type overview, the appliances comply with the basic requirements of the following directives:

- Electromagnetic compatibility directive (Council Directive 2004/108/EC)
- Low voltage directive (Council Directive 2006/95/EC)
- Directive on radio and telecommunications terminal equipment (R&TTE Directive 1999/5/EC)
- Directive on electromagnetic compatibility and radio spectrum matters (Directive ETSI EN 300220-2)

1.6 Glossary

Technical terms are explained in the Glossary (→ **Section 15**) at the end of these operating instructions.





2 Safety

2.1 Safety and warning information

- When installing the VRC 470f, take account of the basic safety instructions and the warnings that may appear before an action.

2.1.1 Classification of warnings


The warning notes are classified in accordance with the severity of the possible danger using the following danger signs and signal words:

Danger sign	Signal word	Explanation
	Danger!	Immediate risk of death or risk of severe personal injury
	Danger!	Risk of death from electric shock
	Warning!	Risk of minor personal injury
	Caution!	Risk of material or environmental damage

Tab. 2.1 Meaning of danger signs and signal words

2.1.2 Structure of warnings

Warning signs are identified by an upper and lower separating line and are laid out according to the following basic principle:

	Signal word!
	Type and source of danger! Explanation of the type and source of danger. ➤ Measures for averting the danger.

2.2 Intended use

The Vaillant VRC 470f controller is a state-of-the-art appliance constructed in accordance with recognised safety regulations. Nevertheless, there is a risk of death or serious injury to the operator or others or of damage to the appliances and other property in the event of improper use or use for which they are not intended.

The Vaillant VRC 470f controller controls a heating system based on outside temperature and programmed timings. The controller is connected to a Vaillant boiler with an eBUS interface.

The controller can also control the supply of domestic hot water from a connected DHW cylinder with or without secondary return.

You should only remove the controller temporarily from the wall-mounting base, e.g. to adjust the settings. Apart from that, you should always operate it in conjunction with the wall-mounting base.

Operation is permissible with the following components and accessories:

- Domestic hot water cylinder (conventional)
- Vaillant stratified charge cylinder actoSTOR VIH RL
- Circulation pump for the hot water supply
- Second heating circuit
- Solar system
- Remote control unit

Any other use, or use beyond that specified, shall be considered as improper use. Any direct commercial or industrial use is also deemed to be improper. The manufacturer/supplier is not liable for any damage resulting from improper use. In this case, the user alone bears the liability.

It is also considered as intended use to observe:

- the operating and installation instructions
- all other applicable documents
- compliance with the care and maintenance conditions.

Improper use of any kind is prohibited!

2.3 Basic safety instructions

The device must be installed by a competent person, who is responsible for compliance with the applicable requirements, regulations and directives.

- Read through these installation instructions carefully.
- Carry out the activities that are described in these installation instructions.
- During the installation, observe the following safety instructions and regulations.

2 Safety

Protecting against legionella

The controller is furnished with an anti-legionella function to protect against infection by germs (legionella). When the function is activated, the water in the domestic hot water cylinder is heated to over 60°C for at least one hour.

- Set the anti-legionella function when installing the controller.
- Explain to the operator how the anti-legionella function works.

Preventing the risk of scalding

There is a danger of scalding at the hot water draw-off points if the temperatures are greater than 60°C. Young children and elderly persons are particularly at risk from scalding at lower temperatures.

- Select a moderate target temperature.
- Inform the owner about the risk of scalding when the anti-legionella function is switched on.

Protecting the controller from damage

- The controller should only be installed in dry rooms.

Preventing malfunction

- Ensure that the heating system is in a technically perfect condition.
- Ensure that no safety or monitoring devices have been removed, bridged or disabled.
- Immediately rectify any faults and damage that may affect safety.
- Inform the operator that he must not cover the controller with furniture, curtains or other objects.
- If thermostatic control is activated, advise the operator that, in the room where the controller is mounted, all the radiator valves must be fully open.

2.4 Requirements for cables

- Use standard commercial cables for wiring.

Minimum cross-section of the cable:

- Supply cable 230 V (pumps or mixer supply cable): 1.5 mm²
- Low-voltage conductors(sensor or bus lines): 0.75 mm²

Maximum cable length:

- Sensor lines: 50 m
- Bus lines: 300m
- At lengths of over 10 m, 230V supply cables must be laid separately from sensor or bus lines.
- Fasten the supply cables using the strain relief device in the wall mount.
- Do not use the free terminals in the appliance as supports for other wiring.
- The controller should only be installed in dry rooms.

2.5 Directives, laws and standards

- All wiring must be in accordance with Building Regulations Part P and BS 7671 (IEE Wiring Regulations), and must be carried out by a suitably qualified person.

3 System description

3.1 System design

The VRC 470f controller controls the Vaillant heating and hot water systems.

You can fix the controller to a wall using the wall-mounting base.

You can mount the radio receiver unit on a wall using the wall-mounting base or in the controller slot of a Vaillant boiler, without the wall-mounting base.

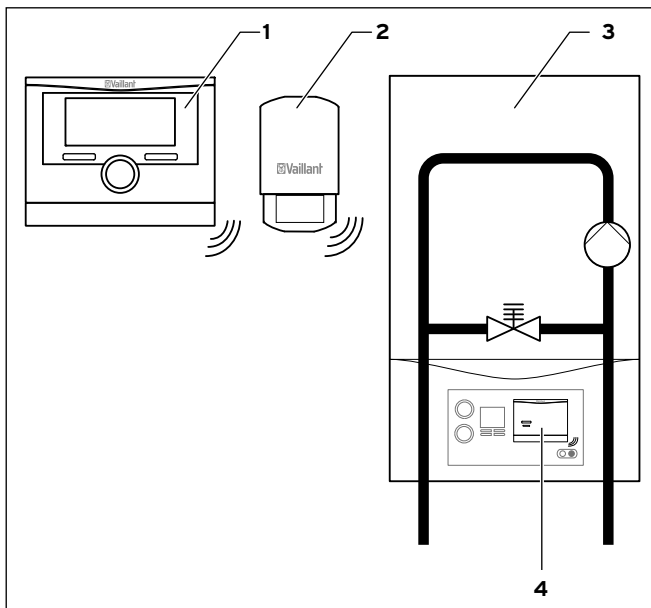


Fig. 3.1 System drawing

- 1 VRC 470f controller
- 2 VR 21 outside temperature sensor/transmitter (DCF77)
- 3 Boiler
- 4 Radio receiver unit

3.2 Functionality

Heating installation

The VRC 470f is a weather compensator with a separate sensor. The VR 21 sensor is fitted outdoors and measures the outside temperature and transmits it by radio signal to the controller. The controller controls the flow temperature of the heating as a function of the outside temperature. If the outside temperature is low, the controller increases the flow temperature, and if the outside temperature is high, it reduces the flow temperature again. Thus, the controller absorbs fluctuations in the outside temperature and the room temperature remains at the constant, preset temperature value.

Hot water production is not affected by the weather compensation.

The controller is supplied with power by batteries.

Data transmission between the controller and the radio receiver unit takes place via radio communication. Data transmission between the radio receiver unit and the boiler takes place via an eBUS interface, which also provides the power supply for the radio receiver unit.

For remote diagnosis and programming, you can equip the controller with the Vaillant Internet communication system vrnetDIALOG.

Hot water production

With the VRC 470f controller you can also specify the temperature and timings for hot water production. The boiler heats the water in the domestic hot water cylinder to the preset temperature. The times at which hot water should be available in the cylinder, can be defined with the help of time periods.

If a circulation pump is installed in the heating system, time periods can also be set for circulation of the hot water.

3 System description

3.3 Appliance design

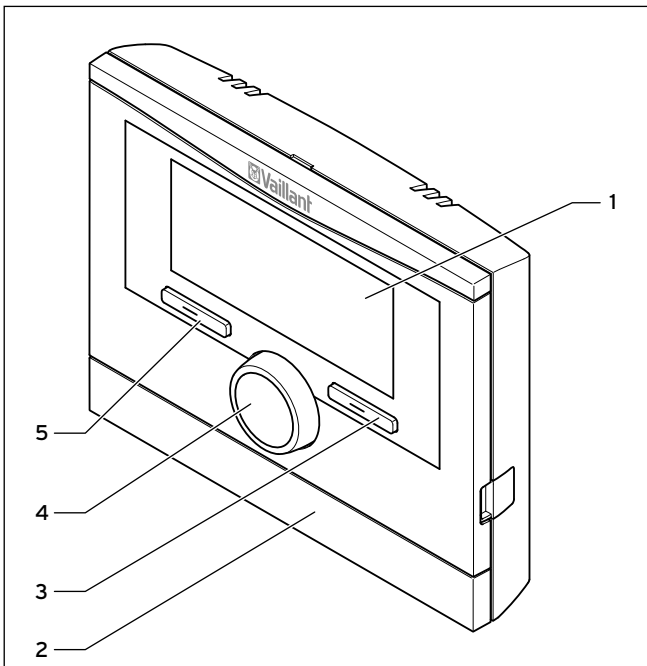


Fig. 3.2 Front view of VRC 470f radio controller

- 1 Display
- 2 Wall-mounting base cover
- 3 Right function key for "Mode" (soft key function)
- 4 Control knob (no button function)
- 5 Left function key for "Menu" (soft key function)

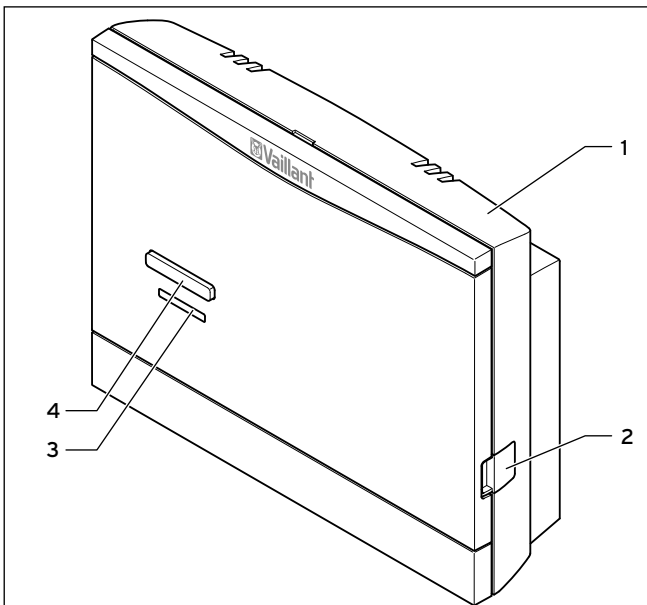


Fig. 3.3 Front view of radio receiver unit

- 1 Wall-mounting base
- 2 Diagnosis socket for the heating engineer
- 3 LED
- 4 Teach-in button

3.4 Identification plate

The identification plate is located on the rear panel of the controller casing.

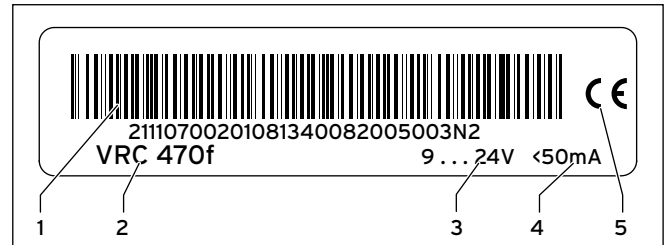


Fig. 3.4 Identification plate (example)

- 1 EAN code
- 2 Appliance designation
- 3 Operating voltage
- 4 Current consumption
- 5 CE label

3.5 Accessories



If the controller is supplemented with accessories, please note all relevant installation instructions.

The following accessories can be used to expand controller functionalities:

Multi-function module VR 40

The multi-function model VR 40 can be used by the controller to control a circulation pump.

Mixer module VR 61/2

The mixer module VR 61/2 expands the controller to a 2-circuit controller.

Solar module VR 68/2

The solar module VR 68/2 can be used by the controller to control a solar system.

Remote control unit VR 81/2

If the second heating circuit is to be satellite controlled, you can use the VR 81/2 remote control unit. You can use the remote control unit VR 81/2 to set the parameter "Room temp. target". In addition, the controller displays service and fault messages by means of symbols. Data interchange is via eBus line.

4 Installation

You can either integrate the radio receiver unit in the boiler or install it separately on a wall. If you are wall-mounting the radio receiver unit, you connect it to the boiler via a 2-core eBUS cable.

You can fix the controller to a wall in the living area.

4.1 Checking the delivery

Quantity	Component
1	VRC 470f controller
1	Radio receiver unit
1	VR 21 outside temperature sensor/transmitter
1	Wall-mounting base for radio receiver unit
1	Wall-mounting base for VRC 470f
2	Fastening material (2 screws and 2 wall plugs)
1	Battery set (4 x AA)
1	3-pin pin header connector
1	Operating instructions
1	Installation instructions

Tab. 4.1 Scope of delivery

4.2 Requirements for the installation site

4.2.1 Radio receiver unit

- Install the radio receiver unit in the boiler.
- If radio communication cannot be established when the radio receiver unit is installed in the boiler, then install it in a suitable position on a wall.

4.2.2 Controller

- Position the controller so that proper detection of the room temperature is possible; e.g. on an internal wall of the main living room, at a height of approx. 1.5 m
- If room temperature control is activated, advise the operator that, in the room where the controller is mounted, all the radiator valves must be fully open.

4.2.3 Outside temperature sensor/transmitter

The installation site of the outside temperature sensor/transmitter should be:

- not fully protected from wind
 - not particularly draughty
 - not in direct sunlight
 - not affected by heat sources
 - on a north or north-west facing wall
 - easily accessible so that the solar cell can easily be cleaned
 - a short distance from the radio receiver unit
- During start-up, check whether radio communication between the outside temperature sensor/transmitter and the radio receiver unit can be established.
- If radio communication is adversely affected by electrical equipment or buildings, then choose a different installation site for the outside temperature sensor/transmitter.

4.3 Fitting the radio receiver unit in the boiler



Danger!

Risk of death from live connections!

When working in the control cabinet of the boiler there is a risk of death from electric shock. Continuous voltage is present on the mains connection terminals, even if the main switch is turned off!

- Switch the main switch off before working on the control cabinet of the boiler.
- Disconnect the boiler from the mains power by disconnecting the mains plug or by de-energising the boiler via an isolating device with a contact opening of at least 3 mm (e. g. fuses or power switches).
- Secure the power supply against being switched on again.
- Open the control cabinet only when the appliance is disconnected from the power source.



When fitting the radio receiver unit in the boiler's switch box, follow the instructions for fitting a controller given in the boiler installation instructions.

Install the radio receiver unit in the boiler as follows:

- Switch off the boiler.
- Ensure that the boiler is disconnected from the power source.

4 Installation

- If necessary, open the front cover on the boiler.
- Carefully lever the blind cover from the control cabinet.
- Carefully lever the radio receiver unit from the wall-mounting base (→ **Section 4.4.1**).
- Check which type of switch box the boiler has:

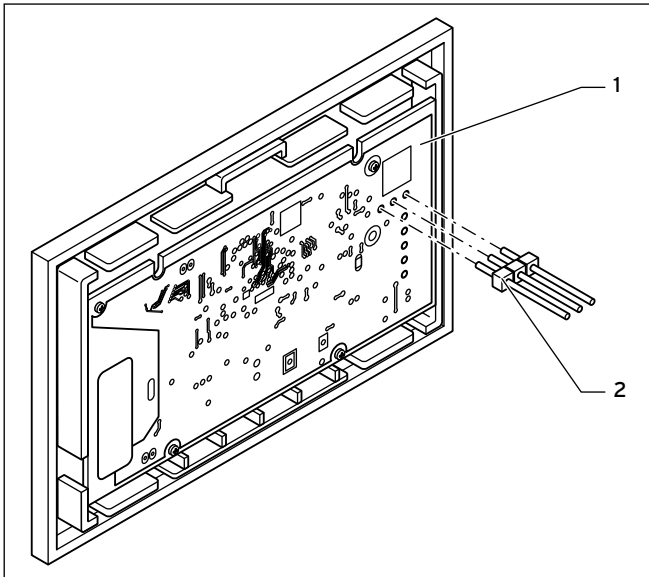


Fig. 4.1 Plugging in/removing pin header connector

If there are **vertical** plug connections with pins:

- If the 3-pin pin header connector (2) is pre-fitted on the PCB (1) of the radio receiver unit, then remove it.
- Carefully press the radio receiver unit into the connection in the switch box.

If there are **horizontal** plug connections without pins on the control cabinet:

- If the 3-pin pin header connector (2) is not pre-fitted, plug the **short pins** of the 3-pin pin header connector supplied with the controller into the horizontal row of 3 holes on the PCB (1) of the radio receiver unit.
- Carefully press the radio receiver unit with the pin header connector into the connection in the switch box.
- If you have not already done so, install the outside temperature sensor/transmitter (→ **Section 4.5**).
- Switch on the power supply to the boiler.
- Bring the boiler into operation.
- If necessary, close the front cover of the boiler.

4.4 Wall-mounting the radio receiver unit



Wall-mounting the radio receiver unit is only necessary if its position needs to be optimised after start-up in order to ensure good radio communication with the controller and the outside temperature sensor/transmitter.

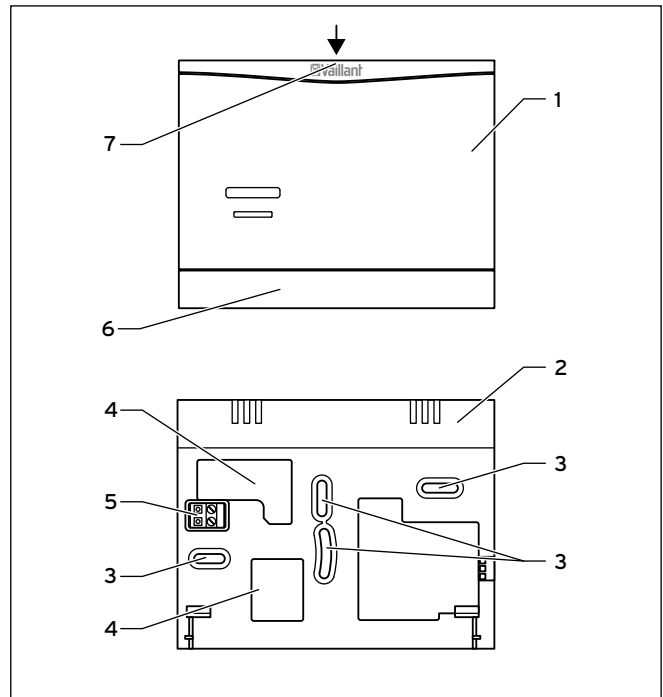


Fig. 4.2 Mounting the radio receiver unit

- 1 Radio receiver unit
- 2 Wall-mounting base
- 3 Mounting holes
- 4 Openings for cable entry
- 5 Pin header with terminals for the eBUS cable
- 6 Wall-mounting base cover
- 7 Slot for screwdriver

4.4.1 Removing the radio receiver unit from the wall-mounting base

- Insert a screwdriver into the slot (7) on the wall-mounting base (2).
- Carefully lever the radio receiver unit (1) off the wall-mounting base (2).

4.4.2 Secure the wall-mounting base to the wall

- Mark the position on the wall. Take the eBUS line route into account when doing so.
- Drill two holes of 6 mm diameter in accordance with the mounting holes (3).
- Insert the wall plugs supplied.
- Insert the eBUS cable through one of the cable opening (4).
- Use the screws supplied to secure the wall-mounting base.
- Connect the eBUS cable to the terminals of the pin header (→ Section 5).

4.4.3 Fitting the radio receiver unit

- Carefully insert the radio receiver unit in the wall-mounting base. Take care to ensure that the pin header connector (5) on the wall-mounting base fits in the connection provided on the radio receiver unit.
- Carefully press the radio receiver unit into the wall-mounting base until the catches on the controller audibly click into the sides of the wall-mounting base.

4.5 Fitting the outside temperature sensor/transmitter



Caution!

Risk of material damage if fitted incorrectly!

Incorrect fitting can cause damage to the device, e.g. caused by damp.

- Take care to fit the outside temperature sensor/transmitter the right way up.



The outside temperature sensor/transmitter is supplied with power by a solar cell. Therefore, there is no need for battery replacement.



The outside temperature sensor/transmitter should not be exposed to direct sunlight.

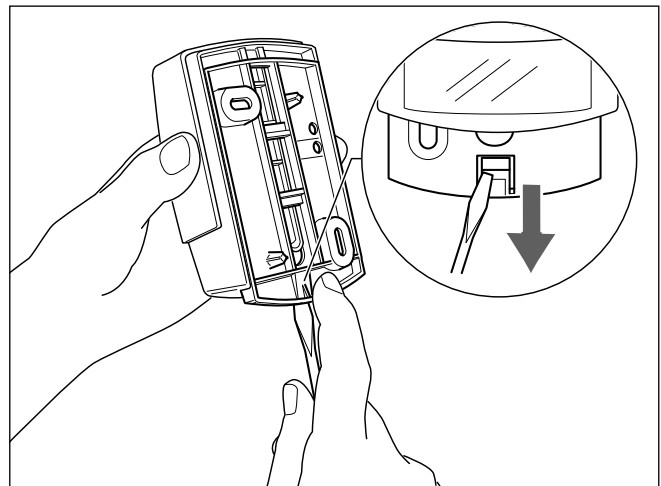


Fig. 4.3 Removing the wall-mounting base

Proceed as follows:

- Mark the position on the wall.
- Remove the wall-mounting base from the outside temperature sensor/transmitter.

4 Installation

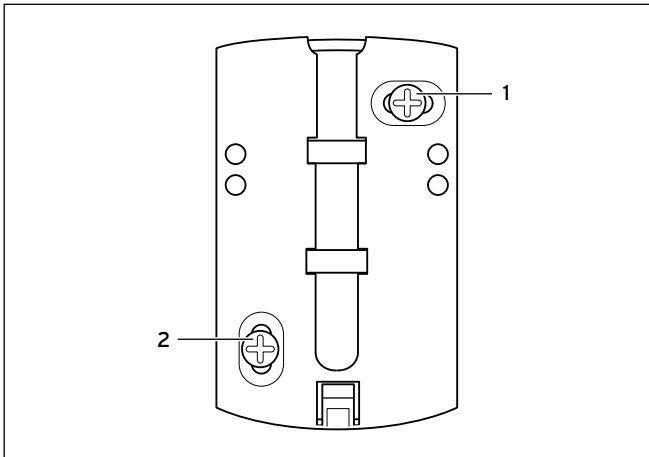


Fig. 4.4 Fitting the wall-mounting base

- ▶ Drill two holes of 6 mm diameter matching the positions of the fixing holes.
- ▶ Insert the wall plugs supplied.
- ▶ Fix the wall-mounting base to the wall using two screws (**1**, **2**).

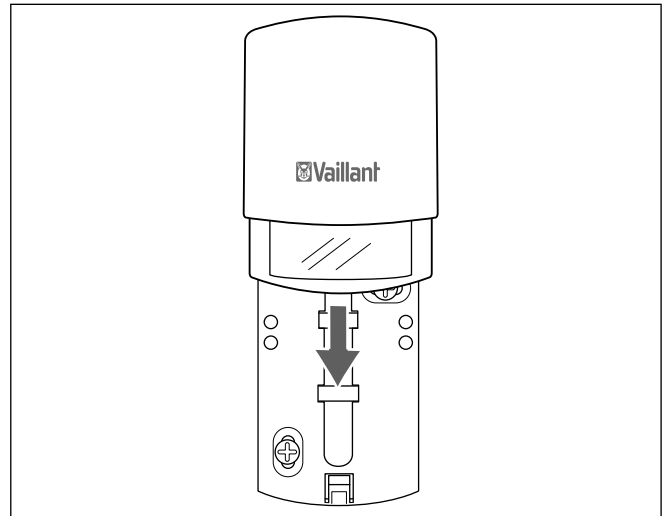


Fig. 4.6 Attaching the outside temperature sensor/transmitter

- ▶ Slide the outside temperature sensor/transmitter onto the wall-mounting base until it clicks into position.

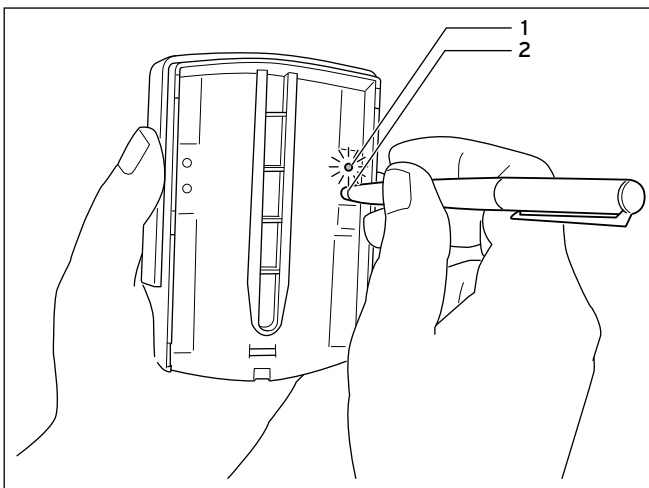


Fig. 4.5 Starting up the outside temperature sensor/transmitter

- 1 LED
- 2 Button

- ▶ Activate the outside temperature sensor/transmitter by pressing the red button (**2**) on the back of the unit with a pointed implement. The green LED (**1**) will flash for about 30 seconds.



Be certain to start up the outside temperature sensor/transmitter as otherwise no data (e.g. outside temperature) will be transmitted to the radio receiver unit.

4.6 Fitting the controller

- Before mounting the controller on the wall, check whether radio communication between the controller and the radio receiver unit can be established (→ **Section 8.7**).
- If radio communication is adversely affected by electrical equipment or buildings, then choose a different installation site for the controller or the radio receiver unit.

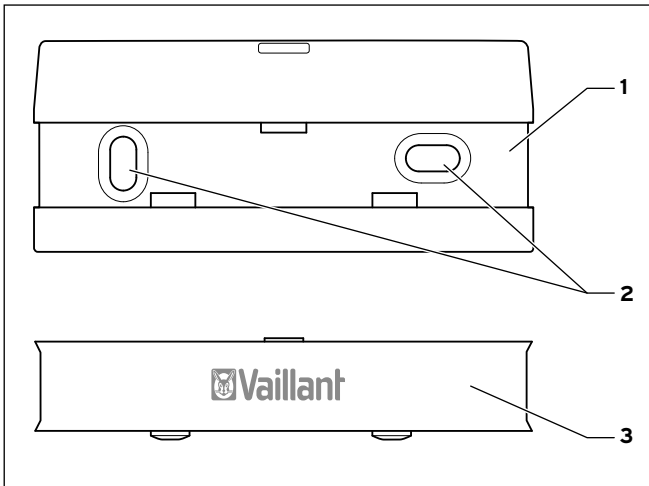


Fig. 4.7 Fitting the wall-mounting base

- 1 Wall-mounting base
- 2 Mounting holes
- 3 Wall-mounting base finishing panel

Proceed as follows:

- Remove the wall-mounting base from the rear of the controller by pulling the base downwards.
- Remove the finishing panel from the wall-mounting base by pulling the top edge of the panel away from the wall-mounting base with your fingers.
- Mark the position on the wall.
- Drill two holes of 6 mm diameter matching the positions of the fixing holes (2).
- Insert the wall plugs supplied.
- Fix the wall-mounting base (1) to the wall using the screws supplied.
- Locate the two bottom lugs of the finishing panel (3) in the holes in the wall-mounting base.
- Press the top edge of the finishing panel into the wall-mounting base until it clicks into position.

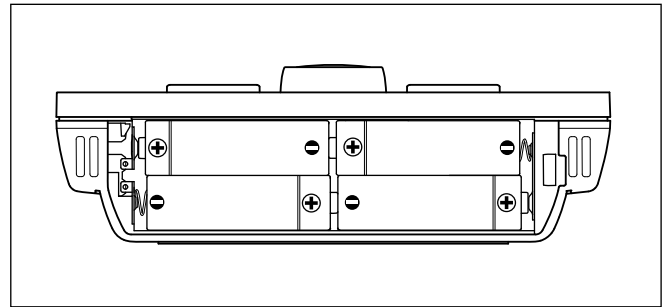


Fig. 4.8 Battery polarity

- Open the battery compartment on the underside of the controller.
- Remove the two plastic strips between the batteries and the contacts.



Make sure battery polarity is the right way round (→ **Fig. 4.8**). Depending on usage, the batteries should last approx. 1 to 1.5 years.

- Close the battery compartment.
- Hook the controller onto the wall-mounting base.
- Press the controller down onto the wall-mounting base until it audibly clicks into position.
- Check the quality of radio communication (→ **Section 8.7**).

5 Electrical installation



Danger!

Risk of death from live connections!

When working in the control cabinet of the boiler there is a risk of death from electric shock. Continuous voltage is present on the mains connection terminals, even if the main switch is turned off!

- Switch the main switch off before working on the control cabinet of the boiler.
- Disconnect the boiler from the mains power by disconnecting the mains plug or by de-energising the boiler via an isolating device with a contact opening of at least 3 mm (e. g. fuses or power switches).
- Secure the power supply against being switched on again.
- Open the control cabinet only when the appliance is disconnected from the power source.

If you fit the radio receiver unit in the boiler, the electrical connections are made by contact between the controller's pin header connector and the mating connection on the boiler. Wiring up the radio receiver unit is only required if you have mounted it on a wall.

Connecting up a wall-mounted radio receiver unit



Caution!

Malfunctions caused by incorrect installation!

Without a bridge between terminals 3 and 4 on the PCB in the control cabinet, the boiler cannot work.

- When connecting the radio receiver unit, ensure that the jumper is fitted between terminals 3 and 4.

- Disconnect the power supply to the boiler.
- Secure the power supply to the boiler against being switched on again.

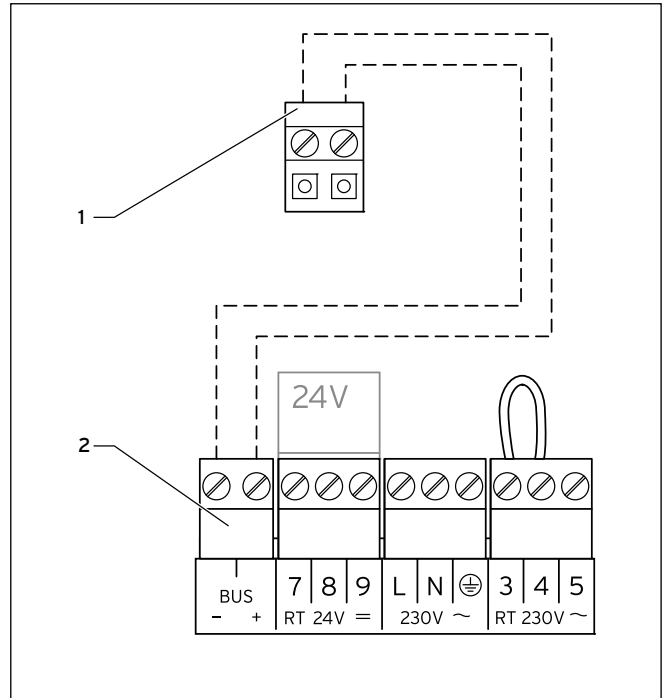


Fig. 5.1 Wiring up the radio receiver unit

- 1 Pin header connector in wall-mounting base of radio receiver unit
- 2 Boiler terminal strip



When connecting the eBUS line, there is no need pay attention to the polarity. If the two connections are switched around, communication is not affected.

Connect the radio receiver unit to the boiler as follows:

- Connect the eBUS line to the terminals (1) of the pin header connector in the wall-mounting base of the radio receiver unit.
- Connect the eBUS line to the terminal strip of the boiler (2).

6 Start-up

When you start the controller for the first time after electrical installation or after replacement, the Installation assistant starts automatically. The installation assistant helps you to enter the most important settings for the heating system.

The operating concept, an example of operation and the menu structure are described in the operating instructions of the controller (→ **Operating instructions**).

All settings that you have made via the Installation assistant can be changed again at a later date via the "Installer level" menu.

The reading and setting options of the Installer level are described in (→ **Section 7**) and (→ **Section 8**).

6.1 Overview of Installation assistant set-up options

Setting	Values		Unit	Step size, select	Factory reset	Own setting
	min.	max.				
Language	-	-	-	Languages available for selection	German	
Heating circuit 1 ³⁾				Generator circuit, inactive	Generator circuit	
Heating circuit 2 ³⁾				Zone, mixing circuit, inactive	Mixing circuit	
LP/ZP relay connection ³⁾				Cylinder charge pump, circulation pump, not connected	Not connected	
Solar flow volume ¹⁾	0.0	99.5	l/min	0.5	17.5	
Multi relay ¹⁾				Difference control, 2nd cylinder	Difference control	
Solar pump kick ¹⁾				OFF, ON	Off	
Solar circuit protection ¹⁾	Off, 110	150	°C	1	130	
Country of installation ²⁾				Country available for selection	Germany	
Heating circuit conf. ³⁾				HEATING 1, HEATING 2, HEATING 1 & HEATING 2	HEATING 1	
Low loss header ⁴⁾				On, Off	Off	
Cylinder				Active, Inactive	Active	

Tab. 6.1 Overview of Installation assistant set-up options

1) Appears only if solar module VR 68/2 is connected.

2) Appears only if solar station VMS is connected.

3) Appears only if mixing module VR 61/2 is connected.

4) Appears only if cylinder actoSTOR VIH RL is connected.

6 Start-up

6.2 Making settings for the operator

Make the following settings for the operator via the Operating level:

- If DCF77 reception is not possible, set the date and time.
- If necessary, change the factory-set designations of the components in the heating system.
- Set the mode for the heating function. The mode for hot water production is dependent on this and cannot be set separately.
- Set the target room temperature ("Desired day temperature").
- Set the set-back temperature ("Desired night temperature").
- Set the hot water temperature ("Desired hot water temperature").
- Set the period for automatic mode of the heating function.
- Set the period for hot water production.
- If relevant, set the period for circulation.

6.3 Setting other parameters for the heating system

You can set other parameters via the "Installer" operating level, (→ **Section 7**) and (→ **Section 8**).

7 Operation

The menu structure, the operating concept and an example of operation are described in the operating instructions of the controller (→ **Operating instructions**).

The controller has two operating levels, the Operator level and the Installer level.

The options for reading information and entering settings on the Operator level are also described in the operating instructions.

Below, you can find the reading and set-up options which can be accessed via the left function key "Menu" and list entry "Installer level".



Several consecutive displays indicate possible additional heating circuits. Menu entries shown in grey are only available if a corresponding expansion module is connected.

7 Operation

7.1 Overview of menu structure

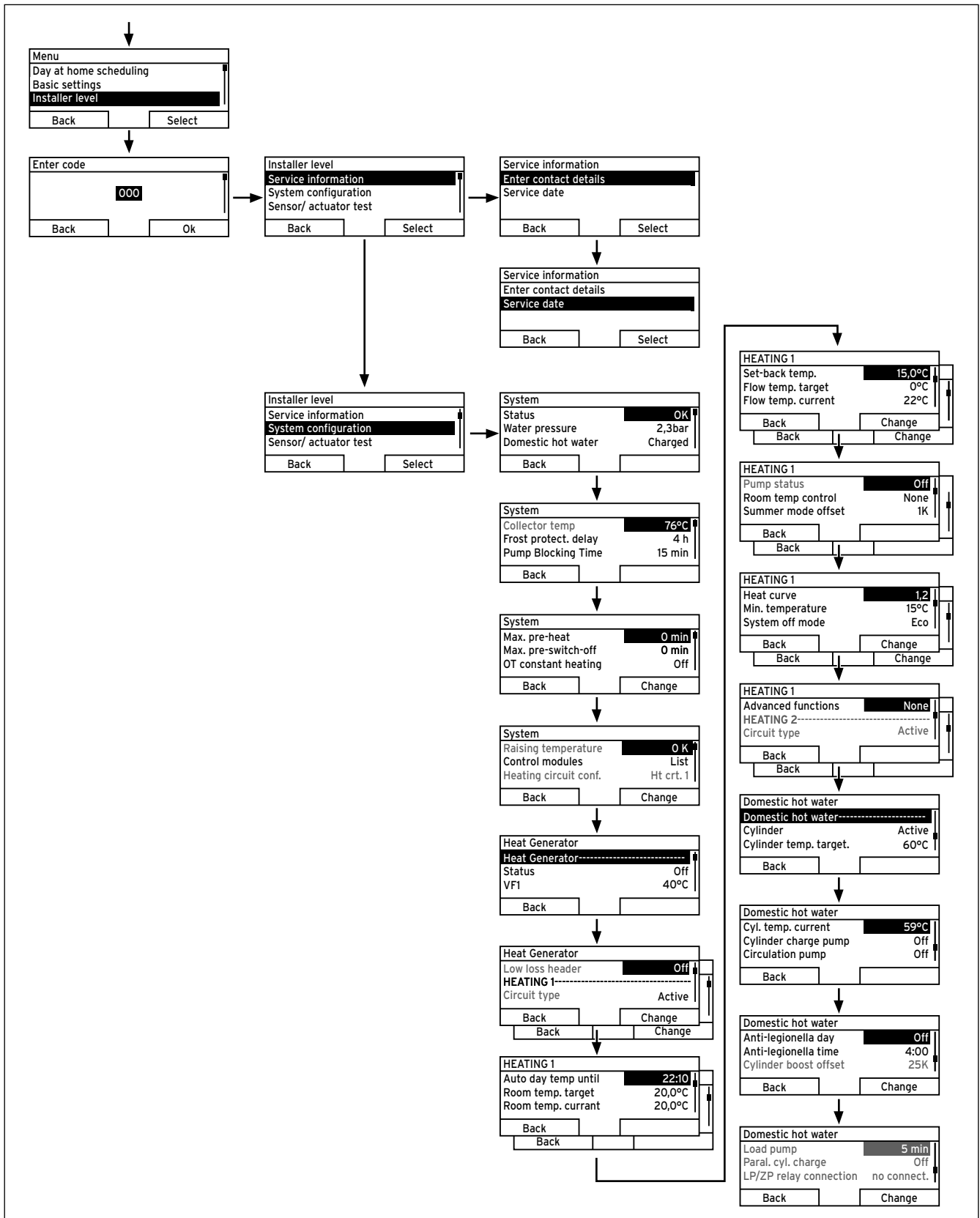


Fig. 7.1 Installer level menu structure Part 1

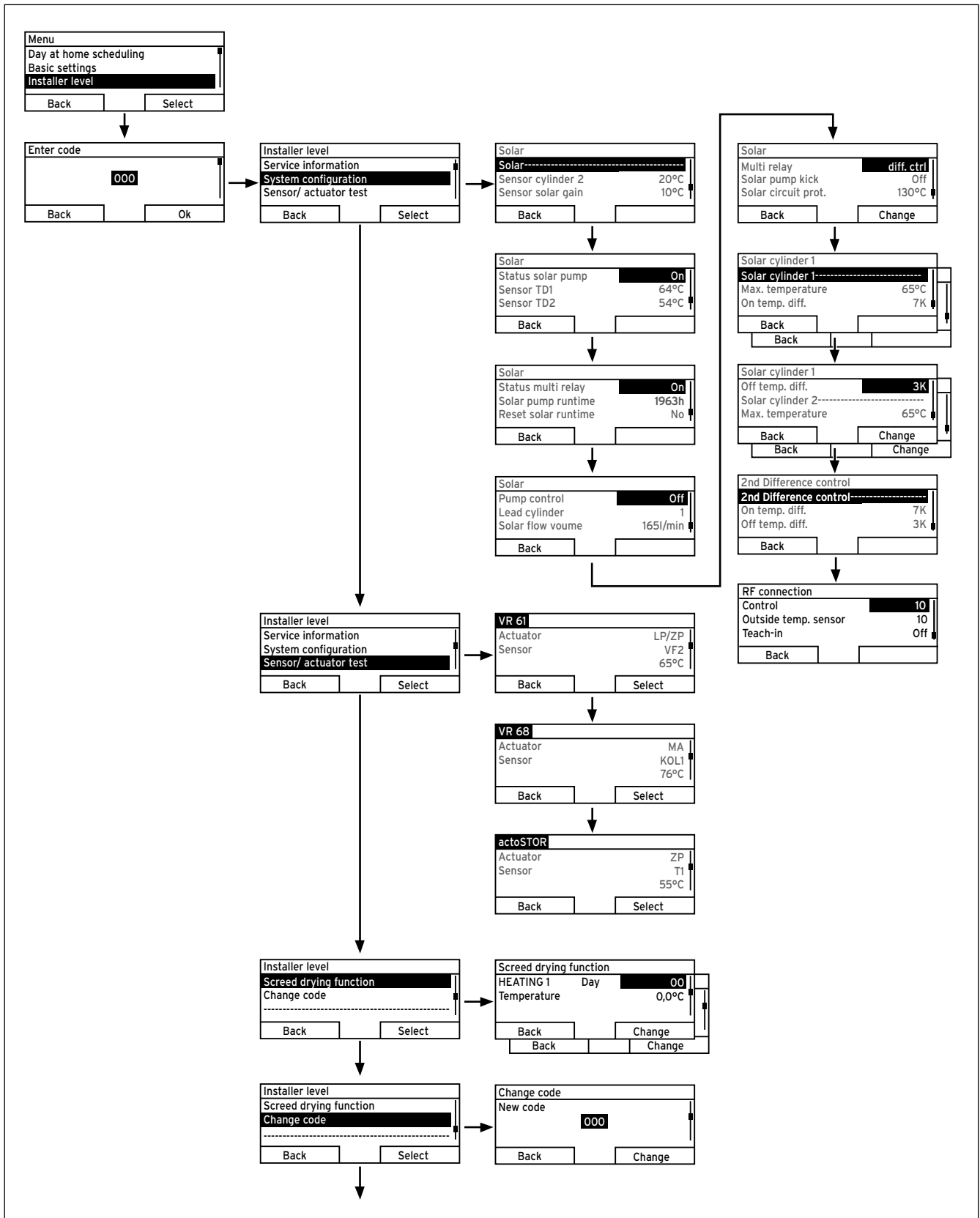


Fig. 7.2 Installer level menu structure Part 2

7 Operation

7.2 Overview of Installer level

Selection level 1	Selection level 2	Selection level 3	Setting level	Values		Unit	Step size, select	Factory reset	Own setting	
				min.	max.					
Installer level			Enter code	000	999	-	1	000		
	Service information	Enter contact details	Installer	1	11	Figures	A to Z, 0 to 9, blank spaces			
			Phone	1	12	Numbers	0 to 9, blank spaces, hyphen			
		Service date	Next service on			Date		01.01.11		
	System configuration	System								
		Status			Current value*		-			
		Water pressure			Current value		bar			
		Domestic hot water			Current value		°C			
		Collector temp ¹⁾			Current value		°C			
		Frost protect. delay			0	12	h	1	4	
		Pump Blocking Time			Off, 5	60	min	1	15	
		Max. pre-heat			0	300	min	10	0	
		Max. pre-switch-off			0	120	min	10	0	
OT constant heating			Off, -25	10	°C	1	Off			
Raising temperature ²⁾			0	15	K		0			
Control modules			List				Software version			
Heating circuit conf. ²⁾							Ht crt. 1, Ht crt. 2, Ht crt. 1&2	Ht crt. 1		

Tab. 7.1 Overview of Installer level

- 1) Appears only if solar module VR 68/2 is connected.
 - 2) Appears only if mixing module VR 61/2 is connected.
 - 3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
 - 4) Appears only if cylinder actoSTOR VIH RL is connected.
 - 5) Appears only if remote control unit VR 81/2 is connected.
 - 6) Appears only if no mixing module VR 61/2 is connected.
 - 7) This figure depends on which expansion module is connected. If no expansion module is connected, the upper limit may be limited by the setting on the boiler.
 - 8) Appears only if solar station VMS is connected.
- * If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message (→ **Section 10.2**) here.

Selection level 1	Selection level 2	Selection level 3	Setting level	Values		Unit	Step size, select	Factory reset	Own setting
				min.	max.				
Installer level	System configuration		Heat generator						
			Status	Current value			Off, Heating, DHW		
			VF1	Current value					
			Low loss header ⁴⁾	Current value			On, Off	Off	
			HEATING 1						
			Circuit type ²⁾	Inactive	Active		Inactive, Active	Active	
			Auto day temp until	Current value		h:min			
			Room temp. target (Day temperature)	5	30	°C	0.5	20	
			Room temp. current ⁵⁾ (Room temperature)	Current value		°C			
			Set-back temp. (Night temperature)	5	30	°C	0.5	15	
			Flow temp. target	Current value		°C			
			Flow temp. current	Current value		°C			
			Pump status ²⁾	Current value			On, Off		
			Room temp control				None, Modulation, Thermost.	None	
			Summer mode offset	-3	30	K	1	1	
			Heat curve	0.20	4.0		0.05	1.2	
			Min. temperature	15	90	°C	1	15	
			System off mode				Eco, Set-back, Frost prot.	Eco	
			Advanced functions	Current value				None	

Tab. 7.1 Overview of Installer level

- 1) Appears only if solar module VR 68/2 is connected.
 - 2) Appears only if mixing module VR 61/2 is connected.
 - 3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
 - 4) Appears only if cylinder actoSTOR VIH RL is connected.
 - 5) Appears only if remote control unit VR 81/2 is connected.
 - 6) Appears only if no mixing module VR 61/2 is connected.
 - 7) This figure depends on which expansion module is connected. If no expansion module is connected, the upper limit may be limited by the setting on the boiler.
 - 8) Appears only if solar station VMS is connected.
- * If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message (→ **Section 10.2**) here.

7 Operation

Selection level 1	Selection level 2	Selection level 3	Setting level	Values		Unit	Step size, select	Factory reset	Own setting
				min.	max.				
Installer level	System configuration		HEATING 2 ²⁾						
			Circuit type	Inactive	Active		Inactive, Active, Zone	Active	
			Auto day temp until	Current value		hr:min			
			Room temp. target (Day temperature)	5	30	°C	0.5	20	
			Room temp. currant (Room temperature)	Current value		°C			
			Set-back temp. (Night temperature)	5	30	°C	0.5	15	
			Flow temp. target	Current value		°C			
			Flow temp. current	Current value		°C			
			Pump status	Current value			On, Off		
			Mixer status	Current value			Opening, Stationary, Closing		
			Room temp control				None, Modulation, Thermost.	None	
			Summer mode offset	-3	30	K	1	1	
			Heat curve	0.20	4.0		0.05	1.2	
			Min. temperature	15	90	°C	1	15	
			Max. temperature	15	90	°C	1	75	
			System off mode				Eco, Set-back, Frost prot.	Frost prot.	
Advanced functions	Current value			None, Away from home, At home, Party function, Cyl. boost	None				

Tab. 7.1 Overview of Installer level

- 1) Appears only if solar module VR 68/2 is connected.
 - 2) Appears only if mixing module VR 61/2 is connected.
 - 3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
 - 4) Appears only if cylinder actoSTOR VIH RL is connected.
 - 5) Appears only if remote control unit VR 81/2 is connected.
 - 6) Appears only if no mixing module VR 61/2 is connected.
 - 7) This figure depends on which expansion module is connected. If no expansion module is connected, the upper limit may be limited by the setting on the boiler.
 - 8) Appears only if solar station VMS is connected.
- * If there is no fault, the status is "OK". If there is a fault, "Fault" appears here and you can read the error message (→ **Section 10.2**) here.

Selection level 1	Selection level 2	Selection level 3	Setting level	Values		Unit	Step size, select	Factory reset	Own setting
				min.	max.				
Installer level	System configuration		Domestic hot water						
			Cylinder	Inactive	Active		Active, Inactive	Active	
			Cylinder temp. target.	35 ⁷⁾	70	°C	1	60	
			Cyl. temp. current	Current value		°C			
			Cylinder charge pump	Current value			On, Off		
			Circulation pump	Current value			On, Off		
			Anti-legionella day				Mon, Tue, Wed, Thu, Fri, Sat, Sun, Off, Mon-Sun	Off	
			Anti-legionella time	0:00	23:50	hr:min	10 min	4:00	
			Cylinder boost offset ³⁾	15	40	K	1	25	
			Load pump ³⁾	0	10	min	1	5	
			Paral. cyl. charge ²⁾	Off	On		Off, On	Off	
LP/ZP relay connection ²⁾				no connect., Circ. pump, Charg.pump	no connect.				

Tab. 7.1 Overview of Installer level

- 1) Appears only if solar module VR 68/2 is connected.
 - 2) Appears only if mixing module VR 61/2 is connected.
 - 3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
 - 4) Appears only if cylinder actoSTOR VIH RL is connected.
 - 5) Appears only if remote control unit VR 81/2 is connected.
 - 6) Appears only if no mixing module VR 61/2 is connected.
 - 7) This figure depends on which expansion module is connected. If no expansion module is connected, the upper limit may be limited by the setting on the boiler.
 - 8) Appears only if solar station VMS is connected.
- * If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message (→ **Section 10.2**) here.

7 Operation

Selection level 1	Selection level 2	Selection level 3	Setting level	Values		Unit	Step size, select	Factory reset	Own setting
				min.	max.				
Installer level	System configuration		Solar ¹⁾						
			Cylinder sensor 2	Current value		°C			
			Sensor solar gain	Current value		°C			
			Status solar pump	Current value			On, Off		
			Sensor TD1	Current value		°C			
			Sensor TD2	Current value		°C			
			Status multi relay	Current value			On, Off		
			Solar pump runtime	Current value		h			
			Reset solar runtime	No	Yes		No, Yes	No	
			Pump control	Current value			Off, On	Off	
			Lead cylinder	1	2		1, 2	1	
			Solar flow volume	0.0	99.0	l/min	0.5	3.5	
			Multi relay				diff. ctrl, Cylinder2	diff. ctrl	
			Solar pump kick	On	Off		On, Off	Off	
			Solar circuit prot.	Off, 110	150	°C	1	130	
			VMS ⁸⁾						
			Country of installation				Country available for selection	Germany	
			Solar cylinder 1 ¹⁾						
			Max. temperature	20	90	°C	1	65	
			On temp. diff.	2	25	K	1	7	
Off temp. diff.	1	20	K	1	3				

Tab. 7.1 Overview of Installer level

- 1) Appears only if solar module VR 68/2 is connected.
 - 2) Appears only if mixing module VR 61/2 is connected.
 - 3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
 - 4) Appears only if cylinder actoSTOR VIH RL is connected.
 - 5) Appears only if remote control unit VR 81/2 is connected.
 - 6) Appears only if no mixing module VR 61/2 is connected.
 - 7) This figure depends on which expansion module is connected. If no expansion module is connected, the upper limit may be limited by the setting on the boiler.
 - 8) Appears only if solar station VMS is connected.
- * If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message (→ **Section 10.2**) here.

Selection level 1	Selection level 2	Selection level 3	Setting level	Values		Unit	Step size, select	Factory reset	Own setting
				min.	max.				
Installer level	System configuration		Solar cylinder 2 ¹⁾						
			Max. temperature	20	90	°C	1	65	
			On temp. diff.	2	25	K	1	7	
			Off temp. diff.	1	20	K	1	3	
			2nd Difference control						
			On temp. diff.	2	25	K	1	7	
			Off temp. diff.	1	20	K	1	3	
			RF connection						
			Control	0	10		1		
			Outside temp. sensor	0	10		1		
			Teach-in	On	Off		On, Off	Off	

Tab. 7.1 Overview of Installer level

- 1) Appears only if solar module VR 68/2 is connected.
- 2) Appears only if mixing module VR 61/2 is connected.
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- 4) Appears only if cylinder actoSTOR VIH RL is connected.
- 5) Appears only if remote control unit VR 81/2 is connected.
- 6) Appears only if no mixing module VR 61/2 is connected.
- 7) This figure depends on which expansion module is connected. If no expansion module is connected, the upper limit may be limited by the setting on the boiler.
- 8) Appears only if solar station VMS is connected.
- * If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message (→ **Section 10.2**) here.

7 Operation

Selection level 1	Selection level 2	Selection level 3	Setting level	Values		Unit	Step size, select	Factory reset	Own setting
				min.	max.				
	Sensor/actuator test		Select module	-	-	-	Connected expansion modules		
			VR 61 ²⁾						
			Actuator			-	LP/ZP, HK1-P, HK2 AUF, HK2 ZU, HK2-P		
			Sensor				VF2	VF2	
			VR 68 ¹⁾						
			Actuator	-	-	-	MA, KOL1-P, LEG-P		
			Sensor				KOL1, SP1, SP2, Yield, TD1, TD2		
			actoSTOR ⁴⁾						
			Actuator	-	-	-	ZP, P1, P2, AL		
			Sensor				T1, T2, T3, T4, Anode		
Installer level	Screed drying function		HEATING 1 Day ⁶⁾	00	29	Day	1	00	
			Temperature ⁶⁾	Curr. value	45	°C			
			HEATING 2 Day ²⁾	00	29	Day	1	00	
			Temperature	Curr. value	45	°C			
	Change code		New code	000	999		1	000	

Tab. 7.1 Overview of Installer level

- 1) Appears only if solar module VR 68/2 is connected.
 - 2) Appears only if mixing module VR 61/2 is connected.
 - 3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
 - 4) Appears only if cylinder actoSTOR VIH RL is connected.
 - 5) Appears only if remote control unit VR 81/2 is connected.
 - 6) Appears only if no mixing module VR 61/2 is connected.
 - 7) This figure depends on which expansion module is connected. If no expansion module is connected, the upper limit may be limited by the setting on the boiler.
 - 8) Appears only if solar station VMS is connected.
- * If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message (→ **Section 10.2**) here.

8 Description of functions

The list entry "Installer level" in selection level 1 of the menu structure has five sub-entries with further selection levels:

- Service information
- System configuration
- Sensor/ actuator test
- Screed drying function
- Change code

Functions with read-out options and functions with set-up options are grouped together here.

The list of the second selection level "System configuration" is structured by components of the heating system:

- System
- Heat generator
- HEATING 1
- Domestic hot water
- Radio communication

If an expansion module VR 61/2 is connected, also:

- HEATING 2

If an expansion module VR 68/2 is connected, also:

- Solar
- Solar cylinder 1
- Solar cylinder 2
- 2nd Difference control

8.1 Service information

8.1.1 Entering contact details

Menu → Installer level → Service information → Enter contact details

You can enter your contact details (company name and phone number) in the controller. When the date of the next service appointment is reached, the operator can view the data in the display of the controller.

You must run through each digit of the company name and telephone number and set them separately.

8.1.2 Entering the service date

Menu → Installer level → Service information → Service date

In the controller, you can save a date (day, month, year) for the next regular service.

When the date for the next service appointment is reached, the message "Service" is displayed in the basic display of the controller.

If a service appointment is saved in the boiler, the message "Service heat generator" appears on the boiler when this date is reached.

The message is switched off if:

- the date is in the future.
- the initial date 01.01.2011 is set.

8.2 System configuration: System

8.2.1 Reading the system status

Menu → Installer level → System configuration [System ----] → Status

This function allows you to read the status of the heating system. If there is no fault, the message "OK" appears here. If there is a fault, the status "Fault" is displayed. If you press the right function key, the list of error messages will be displayed.

Error messages are described in (→ **Section 10.2**).

8.2.2 Reading the water pressure of the heating system

Menu → Installer level → System configuration [System ----] → Water pressure

With this function, you can read the water pressure of the heating system, if the boiler provides this information.

8.2.3 Reading the DHW heating status

Menu → Installer level → System configuration [System ----] → Domestic hot water

This function allows you to read the hot water production status (i.e. Charged, Not charged).

8.2.4 Reading the collector temperature

Only with a connected VR 68/2

Menu → Installer level → System configuration [System ----] → Collector temp

This function allows you to read the current temperature at the collector sensor.

8 Description of functions

8.2.5 Setting the frost protection delay

**Menu → Installer level → System configuration
[System ----] → Frost protect. delay**

This function allows you to delay activation of the frost protection function by setting a delay time.

The frost protection function guarantees frost protection in the heating system for all connected heating circuits in mode "Off" and "Eco" (outside the set period). If the outside temperature falls below 3°C, the set-back temperature is applied as the target room temperature. The heating circuit pump is switched on.

The frost protection function is also activated when the measured room temperature falls below the preset set-back temperature (regardless of the measured outside temperature).

If you set a delay time, the frost protection function is suppressed during this period.

This function is only effective if the "Eco" setting is selected for the "System off mode" function.

8.2.6 Setting the pump blocking time

**Menu → Installer level → System configuration
[System ----] → Pump Blocking Time**

To save energy, you can set the pump blocking time during which the heating circuit pump remains deactivated. For each heating circuit, the controller checks if the measured flow temperature is 2 K above the calculated target value. If this is the case for 15 minutes, the pump of the heating circuit in question is deactivated for the set blocking time. The mixer remains in its current position.

The blocking time set is reduced as a function of the outside temperature.

Example:

Blocking time set = 60 minutes

Outside temperature 20°C = Blocking time 60 min.

Outside temperature 3°C = Blocking time 5 min.

8.2.7 Setting the maximum preheating time

**Menu → Installer level → System configuration
[System ----] → Max. pre-heat**

This function allows you to start the heating function for the heating circuits a set amount of time before the first period of the day, so that the target room temperature is already reached at the beginning of the first period.

The start of heating is determined as a function of the outside temperature (OT):

$OT \leq -20^\circ\text{C}$: preset duration of the pre-heat time

$OT \geq +20^\circ\text{C}$: no pre-heat time

The duration of the pre-heat time is interpolated linearly between these two values.

8.2.8 Setting the maximum pre-switch-off time

**Menu → Installer level → System configuration
[System ----] → Max. pre-switch-off**

You can avoid unnecessary heating in the heating system immediately before a defined switch-off time by setting a pre-switch-off time.

The controller calculates the actual period depending on the outside temperature.

Set the maximum period desired by the owner here.

If the outside temperature is -20°C, pre-switch-off does not take place.

If the outside temperature is +20°C, the set, maximum pre-switch-off time comes into effect.

At outside temperatures between -20 and +20, the controller calculates a value corresponding to a linear progression between -20°C and +20°C.



The calculation is made for the day already started. The earliest start time is 0:00 hours. If a pre-switch-off time of 120 minutes is set and a period of 0:00 to 01:00 hours, the pre-switch-off time does not start at 23:00 hours on the previous day, but at 0:00 hours.

8.2.9 Setting the temperature threshold for constant heating

**Menu → Installer level → System configuration
[System ----] → OT constant heating**

"Outside temperature constant heating" is a configurable temperature value below which heating using the target room temperature/heating curve assigned to the heating circuit is constant outside the programmed period.

The function allows you to define a value for the outside temperature at which a set-back or total shut-down should no longer occur.

8.2.10 Setting the raising temperature

Only with a connected VR 61/2

**Menu → Installer level → System configuration
[System ----] → Raising temperature**

The raising temperature function increases the current heating circuit target value for the mixing circuit by the set value.

This function allows you to heat the mixing circuit to the target temperature during the morning pre-heat mode (also at generator temperature in the target value), although this fixed addition acutely lowers the temperature of the mixing circuit.

The function also allows for an optimal control range for operation of the mixer. Stable operation is only possible if the mixer only rarely has to move to the limit stop.

This ensures improved quality of control.

8.2.11 Reading the software version

**Menu → Installer level → System configuration
[System ----] → Control modules**

This function allows you to read the software versions of the display, the boiler, the radio receiver unit, the outside temperature sensor/transmitter and all expansion modules connected via eBUS.

8.2.12 Configuring the heating circuit

**Menu → Installer level → System configuration
[System ----] → Heating circuit conf.**

This function allows you to define the heating circuit(s) to which the mode setting from Operator level should apply.

Example:

There are two connected heating circuits and you select HEATING 1. For both heating circuits, you activate the "Automatic mode" via the left function key "Menu → Basic settings → Mode". If the operator now changes the mode to "Comfort mode" via the right function key "Mode", then the mode is only changed for HEATING 1. HEATING 2 continues to be operated in "Automatic mode".

8.3 System configuration: Heat generator

8.3.1 Reading the status of the heat generator

**Menu → Installer level → System configuration
[Heat generator ----] → Status**

This function allows you to read the current status of the heat generator (boiler). Off, heating mode, hot water production.

8.3.2 Reading the value of the VF1 temperature sensor

**Menu → Installer level → System configuration
[Heat generator ----] → VF1**

This function allows you to read the current value of temperature sensor VF1.

8.3.3 Activating the low loss header

**Menu → Installer level → System configuration
[Heat generator ----] → Low loss header**

Only with a connected actoSTOR VIH RL

This function allows you to make a setting in the controller to define whether or not the cylinder is connected to the boiler via a low loss header.

8.4 System configuration: HEATING 1 and, if relevant, HEATING 2

8.4.1 Activating the heating circuits

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Circuit type**

This function allows you to define whether or not HEATING 1 or, if relevant, HEATING 2 (if expansion module VR 61/2 is connected) or zone (HEATING 2 without mixing valve) are each activated or deactivated. HEATING 1 is always defined as the Generator circuit, HEATING 2 is always the Mixing circuit.

8.4.2 Reading the end of the current time period

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Auto day temp until**

With this function, you can stipulate for a heating circuit, whether or not a set period is active for the "Auto" mode and how much of the period is still remaining. To do this, the controller must be in "Automatic mode". The information is specified in hr:min.

8 Description of functions

8.4.3 Setting the target room temperature

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Room temp. target**

This function allows you to set the desired target room temperature separately for each heating circuit.

8.4.4 Reading the current room temperature

**Menu → Installer level → System configuration
[HEATING 1 ----] → Room temp. current**

This function allows you to read the current value of the room temperature sensor integrated in the controller.

8.4.5 Setting the set-back temperature (set-back temp.)

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Set-back temp.**

This function allows you to set the desired set-back temperature separately for each heating circuit. The set-back temperature is the temperature to which the heating is to be reduced at times of low heat demand (e.g. overnight).

8.4.6 Reading the target flow temperature

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Flow temp. target**

This function allows you to set the target flow temperature separately for each heating circuit.

8.4.7 Reading the current flow temperature

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Flow temp. current**

This function allows you to read the current flow temperature separately for each heating circuit.

8.4.8 Reading the status of the heating circuit pump

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Flow temp. current**

Only with a connected VR 61/2

This function allows you to read the current status (On, Off) of the heating circuit pump separately for each heating circuit.

8.4.9 Reading the status of the heating circuit mixer valve

**Menu → Installer level → System configuration
[HEATING 2 ----] → Mixer status**

This function allows you to read the current status (opening, closing, stationary) of the heating circuit mixer for HEATING 2.

8.4.10 Activating room temperature control

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Room temp control**

This function allows you to define if the temperature sensor integrated in the controller or in the remote control unit should be used.

Requirement: The controller is not installed in the boiler, but is wall-mounted or the VR 81/2 remote control unit is connected.

None:

Temperature sensor is not used for control.

Thermostatic control:

The built-in temperature sensor measures the current room temperature in the reference room. This value is compared with the target room temperature and, if there is a difference, results in adjustment of the heating flow temperature by means of the so-called "Effective room set target temperature".

Effective room set target temp. = set room target temp. + (set room set temp. - measured room set temp.).

The effective room set target temperature is then used for controlling instead of the set target room temperature.

Thermostat:

Works in the same way as temperature control, however the heating circuit is also switched off when the measured room temperature is 2/16 K greater than the set target room temperature.

When the room temperature falls 3/16 K below the set target room temperature again, the heating circuit is switched on again.

The use of room thermostat control, in combination with careful selection of the heating curve, leads to optimum control of the heating installation.

8.4.11 Activating automatic summer time detection

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Summer mode offset**

This function allows you to define if the controller should automatically activate "Summer mode" based on a temperature calculation for all heating circuits. The controller remains in automatic mode.

You activate this function by setting an offset (in K). The controller activates summer mode when the outside temperature is greater than or equal to the current target room temperature + the set offset value. The target room temperature at night, for example, is the set-back temperature. The controller deactivates summer mode when the outside temperature is less than the target room temperature + the set offset value - 1K.

8.4.12 Setting the heating curve

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Heat curve**

If the heating curve setting is not sufficient to control the living room climate according to the operator's wishes, you can adapt the heating curve setting made during installation.

8.4.13 Setting the minimum flow temperature for heating circuits

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Min. temperature**

You can enter a minimum value for the flow temperature for each heating circuit, which should not be undershot during control. The controller compares the calculated flow temperature with the value set for the minimum temperature and, if there is a difference, adjusts to the higher value.

8.4.14 Setting the maximum flow temperature for the mixing circuit

**Menu → Installer level → System configuration
[HEATING 2 ----] → Max. temperature**

Only with a connected VR 61/2
You can enter a maximum value for the flow temperature of HEATING 2, which should not be undershot during control. The controller compares the calculated flow temperature with the value set for the maximum temperature and, if there is a difference, adjusts to the lower value.

8.4.15 Reading the status of advanced functions

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → Advanced functions**

With this function, you can define if a special operating mode (advanced function), such as Party function, Intermittent ventilation, etc. should be activated for a heating circuit.

8.4.16 Specifying control modes outside time periods

**Menu → Installer level → System configuration
[HEATING 1/2 ----] → System off mode**

This function enables you to specify, for each heating circuit separately, the controller functions in Automatic mode outside active time periods.

Factory reset: Eco

There are three control modes for selection, which you can adapt further by using the Room temperature control:

- **Frost protection:** The heating function is switched off and the frost protection function is active. The heating circuit pump is switched off.
If a second heating circuit is connected, the heating circuit pump is switched off and the heating circuit mixer is closed. The outside temperature is monitored. When the outside temperature falls below 3°C, the controller switches the heating pump on for 10 minutes after the end of the frost protection delay time. If a second heating circuit is connected, the heating circuit mixer remains closed. After the end of the time, the controller checks if the flow temperature is less than 13°C. If the temperature is greater than 13°C, the heating circuit pump is switched off.
If a second heating circuit is connected, the temperature of the VF2 temperature sensor is evaluated and the heating circuit pump is switched off at a temperature greater than 13°C. If the temperature is less than 13°C, the controller switches the heating function on and activates the heating circuit pump. The controller sets the target room temperature to 5°C and checks again if the outside temperature has reached 4°C. If the outside temperature is greater than 4°C, it switches the heating function and the heating circuit pump off.
- **ECO:** The heating function is switched off.
If a second heating circuit is connected, the heating circuit pump is switched off and the heating circuit mixer is closed. The outside temperature is monitored. If the outside temperature falls below 3°C, the controller switches the heating function on after the end of the frost protection delay time. The heating circuit pump is activated.
If a second heating circuit is connected, the heating circuit pump and the heating circuit mixer are activated. The controller controls the target room temperature to the set "Night temperature". Despite the heating function being activated, the burner is only active on demand. The heating function remains active until the outside temperature rises above 4°C, after which the controller switches the heating function off again, but the outside temperature monitoring remains active.
- **Night temperature:** The heating function is switched on and the target room temperature is set to the set "Night temperature" and adjusted to the "Night temperature".

8 Description of functions

8.5 System configuration: Domestic hot water

8.5.1 Setting the target temperature for domestic hot water cylinder (desired hot water temperature)

**Menu → Installer level → System configuration
[Domestic hot water ----] → Cylinder temp. target.**

This function allows you to define the target temperature for a connected domestic hot water cylinder ("desired hot water temperature").

To do this, the temperature for the domestic hot water cylinder must be set to the maximum value in the heat generator.

You must select the temperature in such a way that the heat requirement of the operator is just covered.

8.5.2 Reading the current temperature of the domestic hot water cylinder

**Menu → Installer level → System configuration
[Domestic hot water ----] → Cyl. temp. current**

This function allows you to read the current measured value of the SP1 cylinder sensor.

8.5.3 Reading the status of the cylinder charge pump

**Menu → Installer level → System configuration
[Domestic hot water ----] → Cylinder charge pump**

This function allows you to read the status of the cylinder charge pump (On, Off).

8.5.4 Reading the status of the circulation pump

**Menu → Installer level → System configuration
[Domestic hot water ----] → Circulation pump**

This function allows you to read the status of the circulation pump (On, Off).

8.5.5 Defining the day for executing the anti-legionella function

**Menu → Installer level → System configuration
[Domestic hot water ----] → Anti-legionella day**

With this function, you can define a day or a block of days for execution of the anti-legionella function. When the anti-legionella function is enabled, the respective cylinder and the corresponding hot water pipes are heated up to a temperature of over 60 °C on the set day or block of days. To this end the value of the target cylinder temperature is automatically raised to 70 °C (with 5 K hysteresis). The circulation pump is activated.

The function is terminated automatically when the cylinder sensor SP1 measures a temperature of >60 °C for more than 60 minutes or after a period of 120 minutes has elapsed (to avoid getting "stuck" in this function if water is drawn simultaneously).

Factory setting = Off means no anti-legionella function (due to risk of scalding)!

If "Days away from home" have been planned, the anti-legionella function is not active during these days. It is activated directly on the first day after the "Days away from home" have elapsed and is executed on the defined weekday/block of days at the defined time (→ **Section 8.5.6**).

Example:

The anti-legionella function should be executed weekly on Tuesday at 08:00 a.m. The planned "Days away from home" end on Sunday at 24:00 hours. The anti-legionella function is activated on Monday at 00:00 hours and executed on Tuesday at 08:00 hours.

8.5.6 Defining the time for executing the anti-legionella function

**Menu → Installer level → System configuration
[Domestic hot water ----] → Anti-legionella time**

With this function, you can define the time for executing the anti-legionella function.

When the time is reached on the defined day or block of days, the function starts automatically if "Days away from home" (holidays) are not planned.

8.5.7 Defining the offset for charging the domestic hot water cylinder

**Menu → Installer level → System configuration
[Domestic hot water ----] → Cylinder boost offset**

Only with a connected VR 61/2 or VR 68/2

With this function, you can define an offset value (K) for the desired hot water temperature. The domestic hot water cylinder is then charged with the temperature that results from the total of the desired hot water temperature and this offset value.

8.5.8 Defining the run-on time for the cylinder charge pump

**Menu → Installer level → System configuration
[Domestic hot water ----] → Load pump**

With this function, you can define a run-on time for the cylinder charge pump. The high flow temperature required for cylinder charging continues to be delivered to the cylinder as far as possible by means of the load-pump overrun before the heating circuits, the generator circuit in particular, are enabled again.

When cylinder charging ends ("desired hot water temperature" reached), the controller switches the boiler off. The run-on time for the cylinder charge pump starts. The controller automatically deactivates the cylinder charge pump after the run-on time has elapsed. If a VIH RL cylinder is connected and if the cylinder is connected directly to the boiler, the function has no effect.

8.5.9 Activating parallel charging (domestic hot water cylinder and mixing circuit)

Menu → Installer level → System configuration [Domestic hot water ----] → Paral. cyl. charge

With this function, you can define, for the connected mixing circuit, that the mixing circuit should continue to be heated during charging of the domestic hot water cylinder.

When parallel charging is enabled, the mixing circuit continues to be supplied while the cylinder is being charged. Provided there is a demand for heat in the mixing circuit, the controller does not deactivate the heating circuit pump in the mixing circuit.

HEATING 1 is always deactivated during cylinder charging.

8.5.10 Setting the relay output for the cylinder charge pump and circulation pump

Menu → Installer level → System configuration [Domestic hot water ----] → LP/ZP relay connection

Only with a connected VR 61/2

This function allows you to configure the LP/ZP output on the VR 61/2. You can set the controller to operate a cylinder charge pump (LP) or a circulation pump (ZP) as required for the system configuration implemented. The setting "Not connected" means that the output on the VR 61/2 is not used.

8.6 System configuration: Solar



Does not apply in combination with a VMS solar station.

8.6.1 Reading the value of the SP2 cylinder sensor

Menu → Installer level → System configuration [Solar ----] → Sensor cylinder 2

Only with a connected VR 68/2

This function allows you to read the current measured value of the SP2 cylinder sensor.

8.6.2 Reading the value of the solar gain sensor

Menu → Installer level → System configuration [Solar ----] → Sensor solar gain

Only with a connected VR 68/2

This function allows you to read the current measured value of the gain sensor.

8.6.3 Reading the status of the solar pump

Menu → Installer level → System configuration [Solar ----] → Status solar pump

Only with a connected VR 68/2

This function allows you to read the current status of the solar pump (On, Off).

8.6.4 Reading the value of the TD1 sensor

Menu → Installer level → System configuration [Solar ----] → Sensor TD1

Only with a connected VR 68/2

This function allows you to read the current measured value of the TD1 cylinder sensor.

8 Description of functions

8.6.5 Reading the value of the TD2 sensor

**Menu → Installer level → System configuration
[Solar ----] → Sensor TD2**

Only with a connected VR 68/2

This function allows you to read the current measured value of the TD2 cylinder sensor.

8.6.6 Reading the status of the multi relay

**Menu → Installer level → System configuration
[Solar ----] → Status multi relay**

Only with a connected VR 68/2

This function allows you to read the current status of the multi relay (On, Off).

8.6.7 Reading the runtime of the solar pump

**Menu → Installer level → System configuration
[Solar ----] → Solar pump runtime**

Only with a connected VR 68/2

This function allows you to read the measured operating hours of the solar pump since start-up or since the last reset.

8.6.8 Resetting the runtime measurement of the solar pump

**Menu → Installer level → System configuration
[Solar ----] → Reset solar runtime**

Only with a connected VR 68/2

This function allows you to set the totalled operating time in hours of the runtime measurement for the solar pump back to 0.

8.6.9 Activating the solar pump on temperature difference control

**Menu → Installer level → System configuration
[Solar ----] → Pump control**

Only with a connected VR 68/2

This function allows you to keep the solar circuit at the activation value, and thus in operation, for as long as possible. For this purpose the pump is switched on and off in periodical bursts depending on the collector temperature and "lower cylinder temperature".

On reaching the on temperature difference, the function is started with an activation duration of 30% - i.e. the pump is switched on for 18 seconds and then switched off for 42 seconds.

As the temperature difference increases, the activation duration is increased (e.g. 45 seconds on, 15 seconds off). As the temperature difference decreases, the activation duration is decreased (e.g. 20 seconds on, 40 seconds off). The period length is always a minute.

8.6.10 Defining the priority for charging the domestic hot water cylinder

**Menu → Installer level → System configuration
[Solar ----] → Lead cylinder**

Only with a connected VR 68/2

In systems with more than one solar charged domestic hot water cylinder, the lead cylinder is charged as a priority. With this function you can define a lead cylinder.

1 = Cylinder 1 is the cylinder with cylinder sensor SP1

2 = Cylinder 2 is the cylinder with cylinder sensor TD1

This function is only effective if you set "Cylinder 2" for the multi relay when making the setting (→ **Section 8.6.12**).

8.6.11 Setting the flow volume of the solar circuit

**Menu → Installer level → System configuration
[Solar ----] → Solar flow volume**

Only with a connected VR 68/2

This function allows you to set the flow volume for the solar circuit. The correct setting of the flow volume is required so that the solar gain can be determined correctly.

The setting of the flow rate depends on the setting of the solar pump. An incorrect setting results in an inaccurate calculation of the solar gain.

8.6.12 Defining the multi relay setting

**Menu → Installer level → System configuration
[Solar ----] → Multi relay**

Only with a connected VR 68/2

This function allows you to define if, depending on the installed hydraulic scheme, a difference control should be performed or if the second cylinder should be charged.

8.6.13 Activating the solar pump kick

**Menu → Installer level → System configuration
[Solar ----] → Solar pump kick**

Only with a connected VR 68/2

This function allows you to activate a pump kick for the solar pump, in order to speed up the temperature recording of the collector temperature.

Depending on the design, there is a time delay in some collectors during calculation of the measured value for temperature recording. With the solar pump kick function, you can reduce the time delay.

When the solar pump kick function is activated, the solar pump is switched on for 15 s (solar pump kick), when the temperature at the collector sensor has risen by 2 K/hour. This transports the heated solar fluid to the point of measurement more quickly.

If the temperature difference between the collector and the cylinder exceeds the preset switch-on difference, the solar pump runs for an appropriate length of time to heat up the cylinder (difference control).

8.6.14 Setting the solar circuit protection

Menu → Installer level → System configuration [Solar ----] → Solar circuit prot.

Only with a connected VR 68/2

With this function, you can define a temperature threshold for the calculated collector temperature in the solar circuit. If the available solar heat exceeds the current heat requirement (e.g. all cylinders fully charged), the temperature in the collector array may rise steeply.

If the protection temperature set at the collector sensor is exceeded, the solar pump is switched off to protect the solar circuit (pump, valves, etc.) against overheating. The solar pump is switched back on once the system has cooled down (30 K hysteresis).

In combination with a VMS solar station, the setting parameters are hidden. The solar station has its own protection function, which is always active.

8.6.15 Defining the maximum temperature for the solar cylinder

Menu → Installer level → System configuration [Solar ----] [Solar cylinder 1/2 ----] → Max. temperature

Only with a connected VR 68/2

This function allows you to define a maximum value as a limit for the solar cylinder temperature, in order to guarantee the highest possible gain from the solar cylinder heating, but also to ensure protection against calcification.

The maximum value of cylinder sensors SP1 and SP2 is used for the measurement.

For the second cylinder (swimming pool) cylinder sensor TD1 is used.

If the set maximum temperature is exceeded, the controller switches the solar pump off.

Solar charging is only enabled again once the temperature at the active sensor drops 1.5 K below the maximum temperature.

The maximum temperature can be set separately for each cylinder.

The programmed maximum temperature must not exceed the cylinder's maximum permissible water temperature!

8.6.16 Defining the on temperature difference value for solar charging

Menu → Installer level → System configuration [Solar ----] [Solar cylinder 1/2 ----] → On temp. diff.

Only with a connected VR 68/2

This function allows you to define a difference value for starting solar charging. If the temperature difference between cylinder sensor SP2 and collector sensor KOL1 exceeds the set value, the controller switches the solar pump on and the solar cylinder is charged.

The difference value can be defined separately for two connected solar cylinders.

8.6.17 Defining the off temperature difference value for solar charging

Menu → Installer level → System configuration [Solar ----] [Solar cylinder 1/2 ----] → Off temp. diff.

Only with a connected VR 68/2

This function allows you to define a difference value for stopping solar charging. If the temperature difference between cylinder sensor SP2 and collector sensor KOL1 falls below the set value, the controller switches the solar pump off and the solar cylinder is no longer charged.

The off temperature difference value must be at least 1K less than the set on temperature difference value. Therefore the value for the setting difference is automatically adjusted when 1 K is exceeded.

You can define the difference value separately for two connected solar cylinders.

8.6.18 Defining the on temperature difference value for second difference control

Menu → Installer level → System configuration [Solar ----] [2nd Difference control ----] → On temp. diff.

Only with a connected VR 68/2

This function allows you to define a difference value for starting solar support.

If the temperature difference between cylinder sensor TD1 and temperature sensor TD2 in the return of the solar circuit exceeds the set value, the controller activates output MA (Multi relay).

This function is only effective if "diff. ctrl." is selected when setting the multi relay (→ **Section 8.6.12**).

8 Description of functions

8.6.19 Defining the off temperature difference value for second difference control

Menu → Installer level → System configuration [Solar ----] [2nd Difference control ----] → Off temp. diff.

Only with a connected VR 68/2

This function allows you to define a difference value for stopping solar support.

If the temperature difference between cylinder sensor TD1 and temperature sensor TD2 in the return of the solar circuit falls below the set value, the controller deactivates the output MA (Multi relay).

This function is only effective if "diff. ctrl." is selected as the setting for the multi relay (→ **Section 8.6.12**).

8.7 Radio communication system configuration

8.7.1 Checking radio communication between controller and radio receiver unit

Menu → Installer level → System configuration [RF connection ----] → Control

The quality of the radio link is indicated by a number on a scale of 0 to 10.

0: No reception

1: Poor quality

10: Excellent quality

The reception quality indication automatically updates if there is a change.

You should change the location of the controller or radio receiver unit if the quality rating is below 3.

The range of radio transmission inside buildings greatly depends on the local conditions (e.g. design and structure of the building). Consequently, an indoor range of 25 m cannot always be guaranteed. Outside enclosed spaces (outdoors) the range is more than 100 m.

8.7.2 Checking radio communication between outside temperature sensor/transmitter and radio receiver unit

Menu → Installer level → System configuration [RF connection ----] → Outside temp. sensor

The quality of the radio link is indicated by a number on a scale of 0 to 10.

0: No reception

1: Poor quality

10: Excellent quality

The reception quality indication automatically updates if there is a change. In the case of the outside temperature sensor/transmitter, that process can take up to 15 minutes.

You should change the location of the outside temperature sensor/transmitter or radio receiver unit if the quality rating is below 3.

The range of radio transmission inside buildings greatly depends on the local conditions (e.g. design and structure of the building). Consequently, an indoor range of 25 m cannot always be guaranteed. Outside enclosed spaces (outdoors) the range is more than 100 m.

8.7.3 Commissioning a replacement radio controller (teach-in)

Menu → Installer level → System configuration [RF connection ----] → Teach-in

If you have replaced a defective controller, you can use this function to commission the new controller (→ **Section 11.4.4**).

8.8 Selecting the expansion module for sensor/ actuator test

Menu → Installer level → Sensor/ actuator test → [Select module]

This function allows you to select a connected expansion module for the sensor and actuator test.

The controller lists the actuators and sensors of the selected expansion module.

If you confirm the selection of an actuator with "Ok", the controller activates the relay. The actuator's function can now be checked. Only the activated actuator is active, all other actuators are "deactivated" at this time. For example, you can drive a mixer in the "OPEN" direction and check that it is connected the right way round or activate a pump and check that it starts up.

If you select a sensor, the controller shows the measured value of the selected sensor. For the selected component, read the measured values from the sensors and check whether the individual sensors are providing the expected values (temperature, pressure, flow volume ...).

8.9 Activating the screed drying function

Menu → Installer level → Screed drying function → HEATING 1/2

With this function, you can "dry heat" freshly laid screed in accordance with the construction regulations, according to a defined time and temperature plan.

When floor drying is activated, all the selected operating modes are interrupted.

The controller controls the flow temperature of the controlled heating circuit according to a pre-set program regardless of the outside temperature.

The function is available for HEATING 1 and HEATING 2, but not for both heating circuits at the same time. If mixing module VR 61 is connected, the function is only

available for HEATING 2. The controller operates HEATING 1 in the set mode.

Target flow temperature on starting day 1: 25 °C.

Days after starting the function	Target flow temperature for this day [°C]
1	25
2	30
3	35
4	40
5	45
6 - 12	45
13	40
14	35
15	30
16	25
17 - 23	10 (frost protection function, pump in operation)
24	30
25	35
26	40
27	45
28	35
29	25

Tab. 8.1 Screed drying time and temperature profile

In the display, the mode is displayed with the current day and the target flow temperature. You can set the current day manually.

When the function is started, the current time of the start is saved. The day is changed exactly at this time. After a mains Off/On, floor drying starts with the last active day.

The function ends automatically when the last day of the temperature profile has elapsed (day = 29)

or

if you set the start day to 0 (day = 0).

8.10 Changing the code for Installer level

Menu → Installer level → Change code

This function allows you to change the access code for "Installer level" operating level.

If the code is no longer available, you must reset the controller to the factory setting in order to obtain access to Installer level again.

8.11 Operator level functions

- Select language
- Set date, time
- Switch to summer time
- Set display contrast
- Set offset room temperature
- Set offset outside temperature
- Set modes for heating, hot water production and the circulation pump
- Changing heating circuit naming
- Restoring factory settings
- Activate advanced functions
- Set desired temperature for HEATING 1/HEATING 2
- Set desired temperatures for hot water production
- Set up time programmes for HEATING 1/HEATING 2, hot water production and the circulation pump
- Days away from home scheduling (holiday function)
- Days at home scheduling (bank holiday function)
- Reset the solar gain

9 Handing over to the operator

9 Handing over to the operator

You must inform the operator of the controller about the handling and function of the controller.

- Pass on the instructions and documents for the appliance to the operator for safe keeping.
- Tell the operator the article number of the controller.
- Tell the operator to keep the instructions close to the controller.
- Go through the operating instructions with the operator and answer any questions.
- To protect persons against scalding, inform the operator about
 - whether the anti-legionella function is activated,
 - when the anti-legionella function starts,
 - if a cold water mixing valve is integrated as protection against scalding.
- To avoid malfunctions, provide information on which rules the operator must observe:
 - Only operate the heating system if it is in perfect technical condition,
 - Do not remove, bridge or disable any safety or monitoring devices.
 - Immediately rectify any faults and damage that may affect safety,
 - If the controller is installed in the living room, ensure that the controller is not covered by furniture, curtains or other objects and that all radiator valves in the room in which the controller is mounted, are fully open.
- To avoid damage from frost, inform the operator at the time of handover that
 - the operator must ensure that the heating system remains in operation and rooms are heated adequately during periods of absence during frost,
 - the operator must observe the frost protection instructions.

10 Fault detection and elimination

10.1 Error messages

If a fault occurs in your heating system, an error message will appear in the controller display instead of the basic display. You can access the basic display again by pressing function key "Back".

If the display remains dark or you cannot make any change to the display by pressing the function keys or control knob, there is a system error.

You can also read all current error messages under menu option "Information/System status" (→ **Section 10.2**).

Display	Meaning	Connected appliances	Cause
Heat generator fault	Fault in boiler	Boiler	See boiler instructions
Heat generator communication fault	Boiler connection fault	Boiler	Cable defective, plug connection not correct
Heat generator communication fault	Cylinder connection fault	Cylinder actoSTOR VIH RL	Cable defective, plug connection not correct
Solar gain sensor anode fault	External current anode fault Cylinder	Cylinder actoSTOR VIH RL	Cable defective, plug connection not correct, external current anode defective
Sensor T1 fault	Fault in temperature sensor 1	Temperature sensor 1	Cable defective, plug connection not correct, temperature sensor defective
Sensor T2 fault	Fault in temperature sensor 2	Temperature sensor 2	Cable defective, plug connection not correct, temperature sensor defective
Sensor T3 fault	Fault in temperature sensor 3	Temperature sensor 3	Cable defective, plug connection not correct, temperature sensor defective
Sensor T4 fault	Fault in temperature sensor 4	Temperature sensor 4	Cable defective, plug connection not correct, temperature sensor defective
VR 68/2 communication fault	Solar module VR 68/2 connection fault	Solar module VR 68/2	Cable defective, plug connection not correct
Sensor KOL fault	Collector sensor fault	Solar module VR 68/2	Collector sensor defective
Sensor SP1 fault	Fault in cylinder sensor 1, first cylinder	Solar module VR 68/2	Cable defective, plug connection not correct, cylinder sensor defective
Sensor SP2 fault	Fault in cylinder sensor 2, first cylinder	Solar module VR 68/2	Cable defective, plug connection not correct, cylinder sensor defective
Sensor TD1 fault	Fault in cylinder sensor 1, second cylinder	Solar module VR 68/2	Cable defective, plug connection not correct, cylinder sensor defective
Sensor TD2 fault	Fault in cylinder sensor 2, second cylinder	Solar module VR 68/2	Cable defective, plug connection not correct, cylinder sensor defective
Solar gain sensor Solar gain sensor	Solar gain sensor fault	Solar gain sensor	Cable defective, plug connection not correct, solar gain sensor defective
VR 61/2 communication fault	Mixer module VR 61/2 connection fault	Mixer module VR 61/2	Cable defective, plug connection not correct
Sensor VF2 fault	Fault in flow sensor VF2	Mixer module VR 61/2	Cable defective, plug connection not correct, flow sensor defective
No radio communication	Radio communication fault between VRC 470f and radio receiver unit	VRC 470f radio controller Radio receiver unit	Installation site unsuitable, controller defective, radio receiver unit defective
Clean outside temperature sensor	Fault on VR 21 outside temperature sensor/transmitter	VR 21 outside temperature sensor/transmitter	Solar cell of outside temp. sensor/transmitter dirty, sensor/transmitter defective, installation site unsuitable
Replace battery	Radio controller fault	VRC 470f radio controller	Batteries in radio controller almost out of power

Tab. 10.1 Error messages

10 Fault detection and elimination

10.2 List of errors

Menu → Service information → System status → Status [Fault]

If there is a fault, the status "Fault" is displayed. In this case, the right function key has the function "Display". Press the right function key to view the list of error messages.



Not all error messages in the list appear automatically on the display.

10.3 Restoring factory settings

You can reset your settings back to the factory settings (→ Operating instructions).

Display	Meaning	Connected appliances	Cause
Heat generator fault	Fault in boiler	Boiler	See boiler instructions
Heat generator communication fault	Boiler connection fault	Boiler	Cable defective, plug connection not correct
Communication fault actoSTOR	Cylinder connection fault	Cylinder actoSTOR VIH RL	Cable defective, plug connection not correct
External current anode fault	External current anode fault Cylinder	Cylinder actoSTOR VIH RL	Cable defective, plug connection not correct, external current anode defective
Sensor T1 fault	Fault in temperature sensor 1	Temperature sensor 1	Cable defective, plug connection not correct, temperature sensor defective
Sensor T2 fault	Fault in temperature sensor 2	Temperature sensor 2	Cable defective, plug connection not correct, temperature sensor defective
Sensor T3 fault	Fault in temperature sensor 3	Temperature sensor 3	Cable defective, plug connection not correct, temperature sensor defective
Sensor T4 fault	Fault in temperature sensor 4	Temperature sensor 4	Cable defective, plug connection not correct, temperature sensor defective
Heat exchanger calcified	Heat exchanger of the boiler is calcified	Boiler	See boiler instructions
VR 68/2 communication fault	Solar module VR 68/2 connection fault	Solar module VR 68/2	Cable defective, plug connection not correct
Sensor KOL fault	Collector sensor	Solar module VR 68/2	Collector sensor defective
Sensor SP1 fault	Fault in cylinder sensor 1, first cylinder	Solar module VR 68/2	Cable defective, plug connection not correct, cylinder sensor defective
Sensor SP2 fault	Fault in cylinder sensor 2, first cylinder	Solar module VR 68/2	Cable defective, plug connection not correct, cylinder sensor defective
Sensor TD1 fault	Fault in cylinder sensor 1, second cylinder	Solar module VR 68/2	Cable defective, plug connection not correct, cylinder sensor defective
Sensor TD2 fault	Fault in cylinder sensor 2, second cylinder	Solar module VR 68/2	Cable defective, plug connection not correct, cylinder sensor defective
Solar gain sensor	Solar gain sensor fault	Solar gain sensor	Cable defective, plug connection not correct, solar gain sensor defective
VR 61/2 communication fault	Mixer module VR 61/2 connection fault	Mixer module VR 61/2	Cable defective, plug connection not correct
Sensor VF2 fault	Fault in flow sensor VF2	Mixer module VR 61/2	Cable defective, plug connection not correct, flow sensor defective
No radio communication	Radio communication fault between VRC 470f and radio receiver unit	VRC 470f radio controller Radio receiver unit	Installation site unsuitable, controller defective, radio receiver unit defective
Clean outside temperature sensor	Fault on VR 21 outside temperature sensor/transmitter	VR 21 outside temperature sensor/transmitter	Solar cell of outside temp. sensor/transmitter dirty, sensor/transmitter defective, installation site unsuitable
Replace battery	Radio controller fault	VRC 470f radio controller	Batteries in radio controller almost spent

Tab. 10.2 List of error messages

11 Replacing components

11.1 Recording radio controller settings



When you replace the radio receiver unit and/or the radio controller, the user settings will be partially or completely lost.

Before replacing the radio receiver unit and/or the radio controller, you should make a note of all the settings on the radio controller.

- Scroll through all display pages on the radio controller and note down all manually configurable parameters (e.g. target room temperature, programmed time period).

11.2 Replacing the radio receiver unit



Danger!

Risk of death from live connections!

When working in the control cabinet of the boiler there is a risk of death from electric shock. Continuous voltage is present on the mains connection terminals, even if the main switch is turned off!

- Switch the main switch off before working on the control cabinet of the boiler.
- Disconnect the boiler from the mains power by disconnecting the mains plug or by de-energising the boiler via an isolating device with a contact opening of at least 3 mm (e. g. fuses or power switches).
- Secure the power supply against being switched on again.
- Open the control cabinet only when the appliance is disconnected from the power source.

11.2.1 Removing the faulty radio receiver unit



Before you start, you should make a note of all the settings on the radio controller.

For wall-mounting:

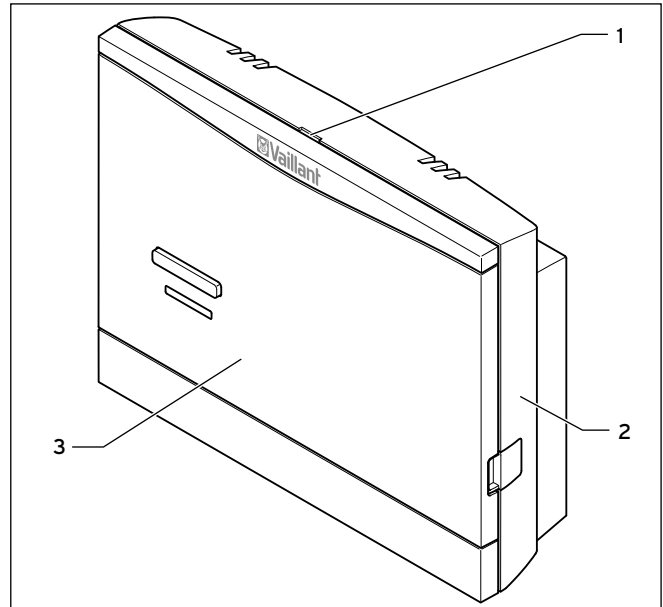


Fig. 11.1 Removing radio receiver unit

- Insert a screwdriver into the slot (1) on the wall-mounting base (2).
- Carefully lever the radio receiver unit (3) off the wall-mounting base (2).
- Dispose of the faulty radio receiver unit correctly.

For installation in the boiler:

- If necessary, open the front cover on the boiler.
- Carefully remove the radio receiver unit from the boiler switch box.
- If necessary, close the front cover on the boiler.
- Dispose of the faulty radio receiver unit correctly.

11.2.2 Fitting the new radio receiver unit

- Fit the new radio receiver unit to the wall as described in (→ **Section 4.3**)/ (→ **Section 4.4**).

11 Replacing components

11.3 Replacing the outside temperature sensor/transmitter

11.3.1 Removing the faulty outside temperature sensor/transmitter

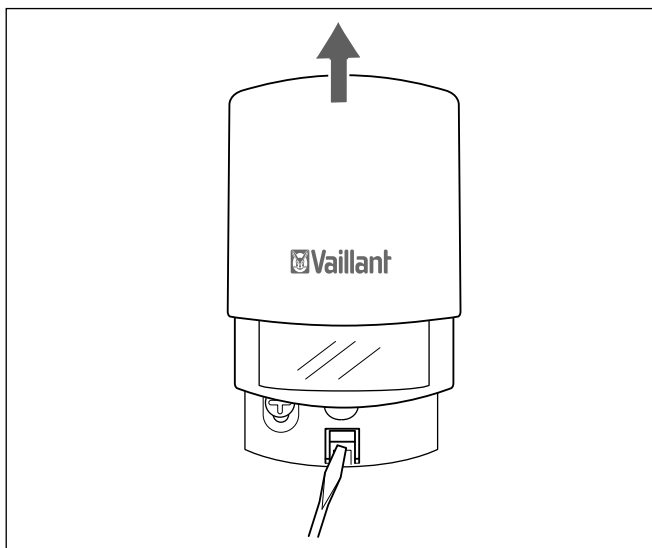


Fig. 11.2 Removing outside temperature sensor/transmitter

- Use a screwdriver to press in the catch at the bottom of the wall-mounting base.
- Lift the outside temperature sensor/transmitter upwards and off the wall-mounting base.



The outside temperature sensor/transmitter has a reserve power supply and will continue sending radio signals to the radio receiver unit for approx. 30 days.

- You should destroy the defective outside temperature sensor/transmitter to make sure it does not continue sending data to the radio receiver unit. (→ **Fig. 11.3**) to (→ **Fig. 11.5**) show how to do so.

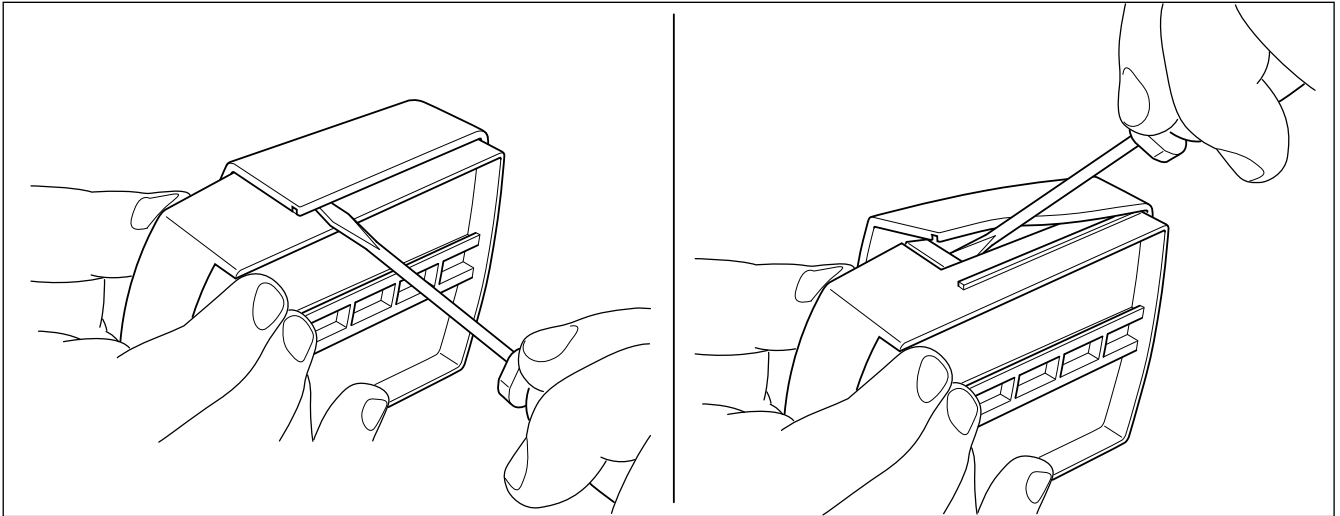


Fig. 11.3 Remove the cover

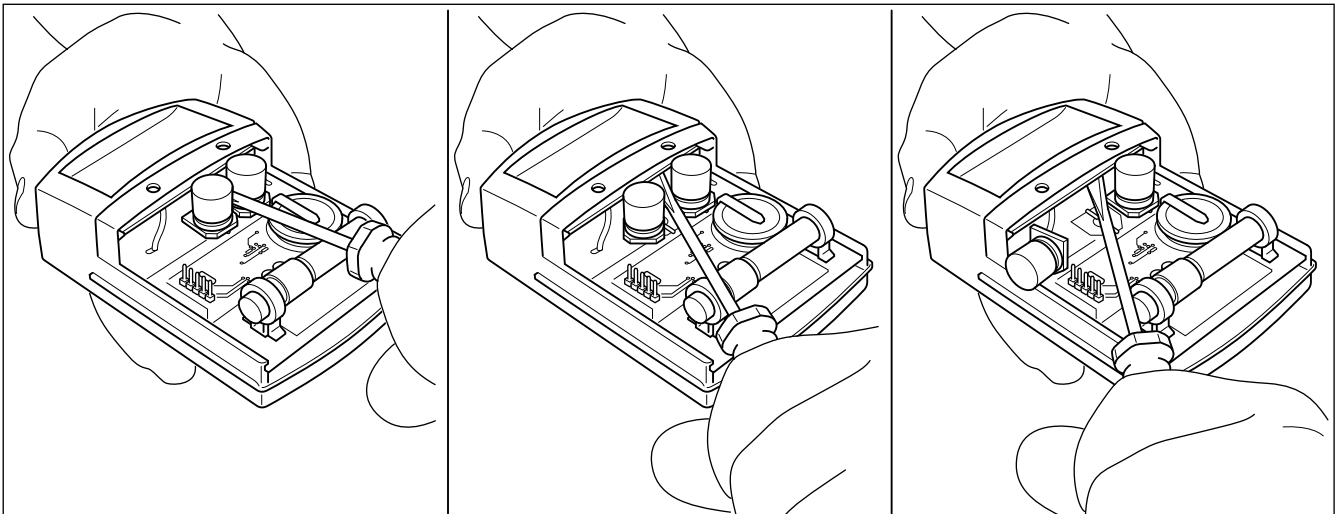


Fig. 11.4 Remove capacitor 1

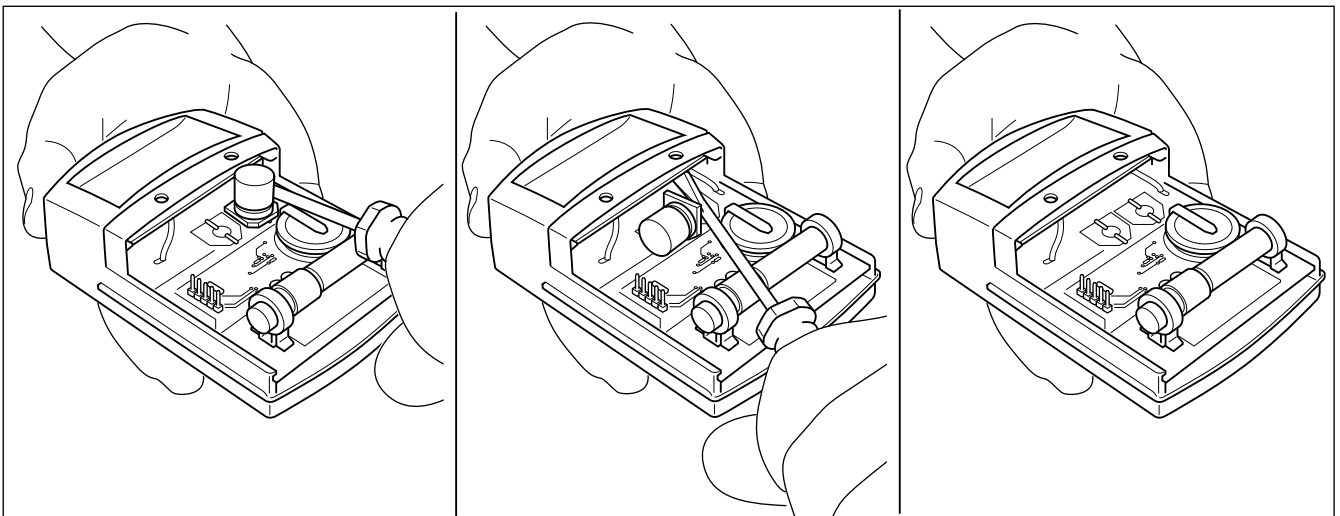


Fig. 11.5 Remove capacitor 2

11 Replacing components

11.3.2 Activating and fitting the new outside temperature sensor/transmitter

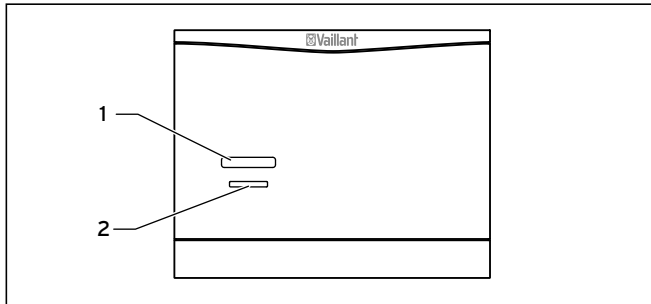


Fig. 11.6 Radio receiver unit controls



Before you activate the outside temperature sensor/transmitter, you must press the teach button on the radio receiver unit to start the teach-in function. The outside temperature sensor/transmitter then has to be activated within the next 15 minutes as the teach-in function automatically terminates after 15 minutes.

► Press the teach button (1) on the radio receiver unit. The teaching sequence starts. The LED (2) on the radio receiver unit flashes.

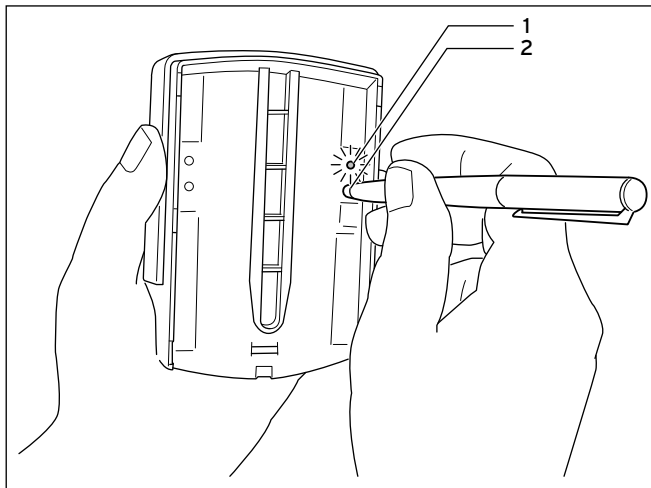


Fig. 11.7 Starting up the outside temperature sensor/transmitter

► Activate the outside temperature sensor/transmitter by pressing the red button (2) on the back of the unit with a pointed implement. The green LED (1) will flash for about 30 seconds.



The outside temperature sensor/transmitter has to be started up as otherwise no data (e.g. outside temperature) is transmitted to the radio receiver unit.

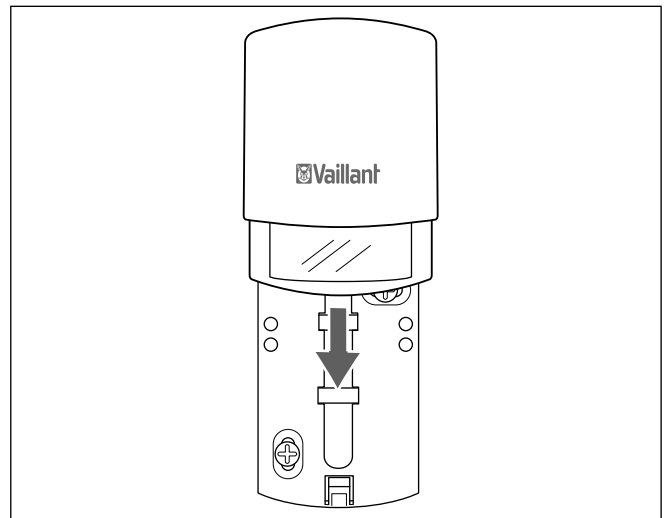


Fig. 11.8 Attaching the outside temperature sensor/transmitter to the wall-mounting base

► Slide the outside temperature sensor/transmitter onto the wall-mounting base until it clicks into position.

11.4 Replacing the radio controller



Before you start, you should make a note of the settings on the radio controller.

11.4.1 Removing the faulty radio controller

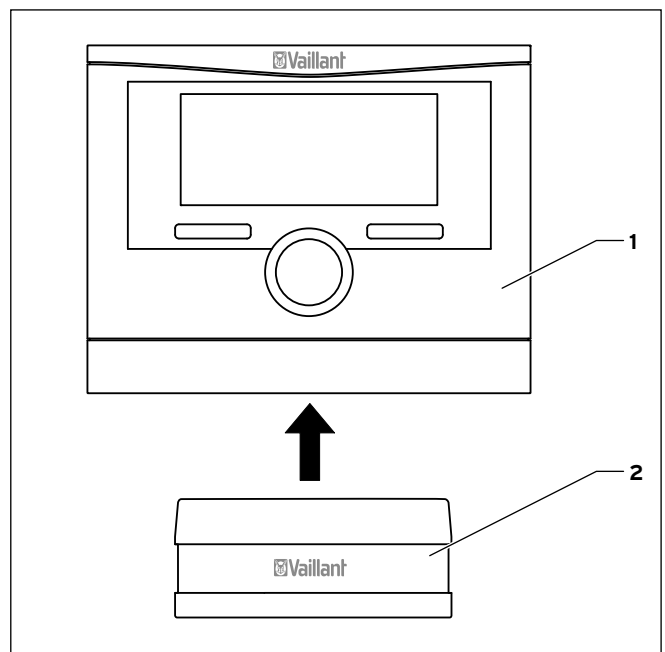


Fig. 11.9 Removing the radio controller

Proceed as follows:

- Pull the controller (1) upwards and off the wall-mounting base (2).
- Remove the batteries.
- Dispose of the batteries and the radio controller correctly.

11.4.2 Fitting the new radio controller

- Insert four **new** batteries of the same type in the controller.

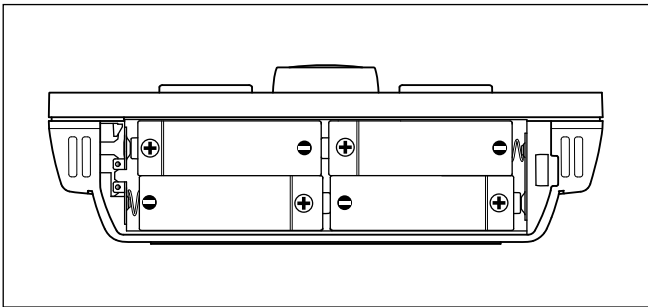


Fig. 11.10 Inserting batteries



Make sure battery poles are the right way round (→ Fig. 11.10).

Always replace all the batteries at the same time. Use only new batteries of the type Alkaline AA/LR6 Battery 1.5 V.

Do not use rechargeable batteries. Depending on usage, the batteries should last approx. 1 to 1.5 years.

- Hook the controller onto the wall-mounting base.
- Press the controller down onto the wall-mounting base until it audibly clicks into position.

11.4.3 Radio receiver unit: starting teach-in

The teaching process is started by pressing the teach button on the radio receiver unit. The teaching process is automatically terminated after approximately 15 minutes. If you also replaced the outside temperature sensor/transmitter before the radio controller, it may be that the process you initiated for activating the outside temperature sensor/transmitter is still active. If it is, the green LED on the radio receiver unit will be flashing.

- If the green LED on the radio receiver unit is flashing, press the teach button to stop the teaching process. The green LED should then stop flashing but remain lit.
- Press the teach button to restart the teaching process. The green LED will start flashing.

11.4.4 Radio controller: activating teach-in



Operation of the radio controller is described in the operating instructions for the radio controller.

- On the controller, select **Menu → Installer level → System configuration [RF connection ----] → Teach-in**
- Set the parameter **Teach-in** to **ON**.

As soon as radio signals are transmitted between the components, the parameter **Teach-in** is automatically reset to **OFF**. That can take less than a second in some cases.



If the figure "0" or "--" is displayed, repeat the teach process for the radio controller and/or the outside temperature sensor/transmitter (→ Section 11.3.2). Make sure that the teach-in function has been activated on the radio receiver unit (→ Section 11.4.3).

11.4.5 Radio controller: restoring recorded settings

- Reinststate all the settings noted down at the start.

12 Warranty and customer service

12 Warranty and customer service

12.1 Vaillant warranty

We only grant a Vaillant manufacturers warranty if a suitably qualified engineer has installed the system in accordance with Vaillant instructions. The system owner will be granted a warranty in accordance with the Vaillant terms and conditions. All requests for work during the guarantee period must be made to Vaillant Service Solutions (0870 6060 777).

12.2 Vaillant Service

To ensure regular servicing, it is strongly recommended that arrangements are made for a Maintenance Agreement. Please contact Vaillant Service Solutions (0870 6060 777) for further details.

13 Decommissioning



Danger!

Risk of death from live connections!

When working in the control cabinet of the boiler there is a risk of death from electric shock. Continuous voltage is present on the mains connection terminals, even if the main switch is turned off!

- Switch the main switch off before working on the control cabinet of the boiler.
- Disconnect the boiler from the mains power by disconnecting the mains plug or by de-energising the boiler via an isolating device with a contact opening of at least 3 mm (e. g. fuses or power switches).
- Secure the power supply against being switched on again.
- Open the control cabinet only when the appliance is disconnected from the power source.

13.1 Decommissioning the controller

- Pull the controller upwards and off the wall-mounting base.
- Remove the batteries.
- Remove the finishing panel from the wall-mounting base by pulling the top edge of the panel away from the wall-mounting base with your fingers.
- Unscrew the wall-mounting base from the wall.
- Plug the holes in the wall if necessary.

13.2 Decommissioning the outside temperature sensor/transmitter

- Remove the outside temperature sensor/transmitter (→ **Section 11.3.1**).
- Unscrew the wall-mounting base from the wall.
- Plug the holes in the wall if necessary.

13.3 Decommissioning the radio receiver unit

If you want to replace or remove the heating system's radio receiver unit, you must first shut down the boiler.

- To do this, follow the instructions in the boiler instructions.
- Ensure that the boiler is disconnected from the power source.

The rest of the procedure depends on where the radio receiver unit is installed.

For wall-mounting:

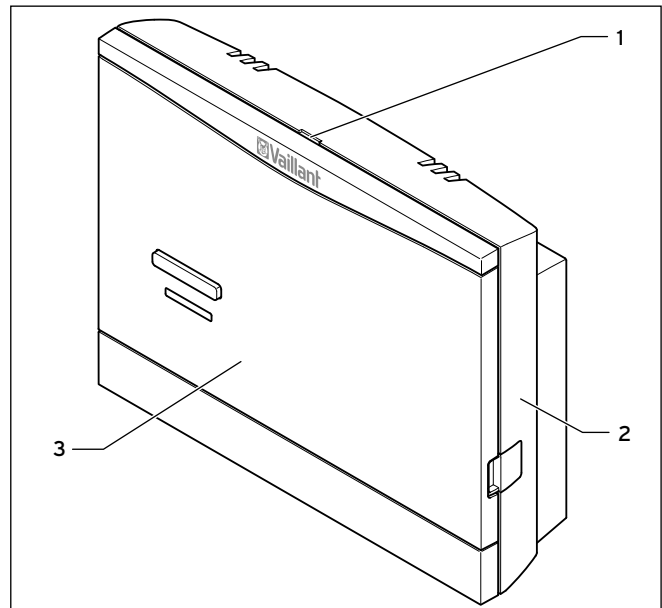


Fig. 13.1 Removing radio receiver unit

- Insert a screwdriver into the slot (1) on the wall-mounting base (2).
- Carefully lever the radio receiver unit (3) off the wall-mounting base (2).
- Disconnect the eBUS cable from the pin header connector in the wall-mounting base of the radio receiver unit.
- Unfasten the eBUS cable from the terminal strip on the boiler.
- Unscrew the wall-mounting base from the wall.
- Plug the holes in the wall if necessary.

For installation in the boiler:

- If necessary, open the front cover on the boiler.
- Carefully remove the radio receiver unit from the boiler switch box.
- If necessary, close the front cover on the boiler.

13 Decommissioning

13.4 Recycling and disposing of the controller, radio receiver unit and outside temperature sensor/transmitter

The devices and their associated transport packaging are made very mainly of recyclable raw materials.

13.4.1 Devices

Neither the devices nor any of their accessories should be disposed of as normal household waste.

- Make sure that the old devices and any accessories are disposed of correctly.

13.4.2 Packaging

- The recognised specialist company that installed the appliance is responsible for disposing of the transport packaging.

13.4.3 Batteries

Used batteries should not be disposed of as normal household waste.

- When disposing of the batteries, make sure you follow the applicable regulations.

14 Technical data



The range of radio transmission inside buildings is heavily dependent on the local conditions (e.g. the design and structure of the building). Consequently, an indoor range of 25 m cannot always be guaranteed. Outside enclosed spaces (outdoors) the range is more than 100 m.

14.1 VRC 470f controller

Designation	Unit	VRC 470f
Operating voltage U_{\max}	V	4 x 1.5 V (AA)
Battery life (alkaline)	Years	Approx. 1.5
Protection type	-	IP 20
Protection class	-	III
Max. permissible ambient temperature	°C	50
Transmission frequency	MHz	868
Transmission power	mW	< 10
Range:		
Outdoors	m	> 100
Inside building	m	Approx. 25
Height	mm	115
Width	mm	147
Depth	mm	50

Tab. 14.1 Technical data of VRC 470f radio controller

14.2 Radio receiver unit

Designation	Unit	Radio receiver unit
Operating voltage U_{\max}	V	24
Current consumption	mA	< 60
Protection type	-	IP 20
Protection class	-	III
Max. permissible ambient temperature	°C	50
Transmission frequency	MHz	868
Transmission power	mW	< 10
Range:		
Outdoors	m	> 100
Inside building	m	Approx. 25
Height	mm	115
Width	mm	147
Depth	mm	50

Tab. 14.2 Technical data of radio receiver unit

14.3 Outside temperature sensor/transmitter

Designation	Unit	Outside temperature sensor/transmitter VR 21
Power supply	-	From solar cell with energy store
Reserve power supply (with full energy store)	Days	Approx. 20
Protection type	-	IP 44
Protection class	-	III
Permissible operating temperature	°C	- 35 ... + 60
Transmission frequency	MHz	868
Transmission power	mW	< 10
Range:		
Outdoors	m	> 100
Inside building	m	Approx. 25
Height	mm	110
Width	mm	76
Depth	mm	41

Tab. 14.3 Technical data of VR 21 outside temperature sensor/transmitter

15 Glossary

Auto_Off

In the "Auto_Off mode" (Installer level), in Automatic mode the control functions outside active time periods can be specified separately for each heating circuit. There are three control modes (frost protection, ECO, set-back temp.) available for selection, which can be further adapted through the use of the room temperature control.

Circulation pump

When you turn on the hot water tap it can take a few moments - depending upon the length of the pipe - before hot water comes out. A circulation pump pumps hot water through the hot water pipe. This ensures that hot water is immediately available when you turn on the tap. Periods can be set for the circulation pump.

DCF77 receiver

A DCF77 receiver receives a remote time signal from sender DCF77 (D-Germany C-Long-wave transmitter F-Frankfurt 77). The time signal sets the time on the controller automatically and provides automatic switching between summer time and winter time. The DCF77 time signal is not available in all countries.

Flow temperature

See Heating flow temperature.

Frost protection delay time

By setting a frost protection delay time (Installer level), activation of the frost protection function (outside temperature < 3°C) can be delayed by a certain period of time (1 - 12 hours).

The frost protection delay setting also works in the "ECO" function in the "Auto_Off" mode (see location). The frost-protection delay time starts when the outside temperature drops below 3°C.

Frost protection function

The frost protection function protects the heating system and dwelling against frost damage. It remains active in the operating mode "OFF".

The frost protection function monitors the outside temperature. When the outside temperature drops below 3°C, the heating pump is switched on for approx. 10 min. and then off for 10 to 60 min. (depending on the outside temperature). If the heating flow temperature is lower than 13°C, the boiler is switched on. The target room temperature is regulated at 5°C. If the outside temperature rises above 4°C, the outside temperature monitoring remains active while the heating pump and boiler are switched off.

When the outside temperature drops below -20°C, the boiler is switched on. The target room temperature is regulated at 5°C.

Heating circuit

A heating circuit is a closed circulation system of pipes and heat consumers (e. g. radiators). The heated water from the boiler flows into the heating circuit and returns to the boiler as cooled water.

A heating installation usually has at least one heating circuit. However additional heating circuits can be connected, e.g. to supply several dwellings or additional underfloor heating.

Heating curve

The heating curve represents the relationship between external temperature and the flow temperature. The selection of a heating curve allows you to influence the flow temperature of the heating system and therefore also the room temperature.

Fig. 1 shows the possible heating curves for a target room temperature of 20°C.

If, for example, heating curve 0.4 is selected, a flow temperature of 40°C is maintained at an outside temperature of -15°C.

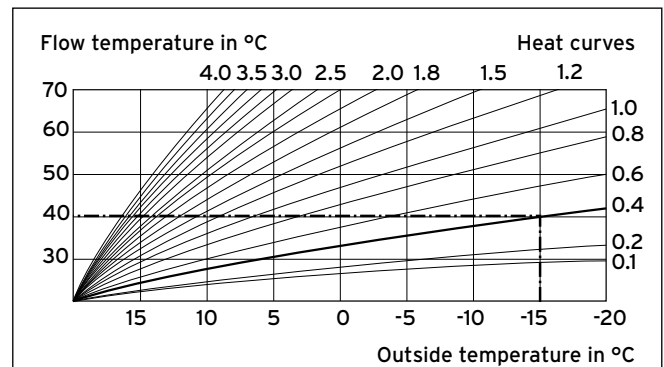


Fig. 15.1 Heating curve diagram

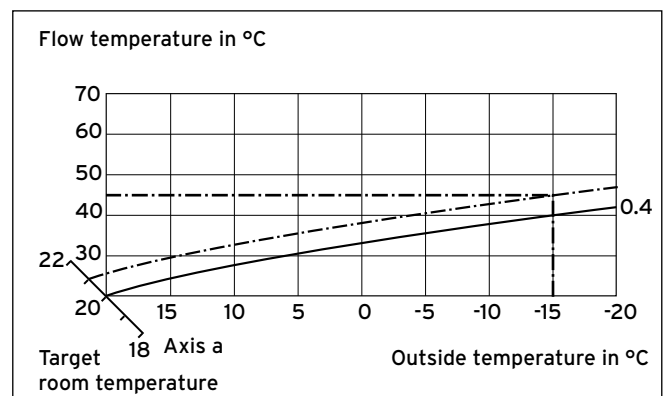


Fig. 15.2 Parallel displacement of the heating curve

If heating curve 0.4 is selected and 21°C rather than 20°C is specified as the target room temperature, the heating curve is displaced as shown in Fig. 2. The heating curve is displaced according to the value of the room target temperature along axis a which is angled at 45°. This means that when the outside temperature is -15°C, the control provides a flow temperature of 45°C.

Heating flow temperature

The boiler heats water which is then pumped through the heating installation. The temperature of this hot water as it leaves the boiler is referred to as the flow temperature.

HK2

HK2 refers to heating circuit 2, which is additional to the appliance's internal circulation system, heating circuit 1. In other words, it refers to the first heating circuit in the heating system.

Hot water production

The boiler heats the water in the domestic hot water cylinder to the selected target temperature. If the temperature in the domestic hot water cylinder falls by specific amount, the water is heated up again to the target temperature. You can set time periods for heating up the contents of the cylinder.

Legionella

Legionella are water-borne bacteria which can quickly propagate and cause serious lung diseases. They occur wherever heated water provides the optimum conditions for multiplication. Temporarily heating the water to above 60°C kills off the legionella.

Mode

With the modes, you determine how the heating system or hot water production is controlled, e.g. in automatic mode or manually.

Room temperature

The room temperature is the temperature actually measured in the dwelling.

Room temperature control

In menu page C8 "HK1 Parameter" you define under option "Room temp control" if you are going to use the integrated temperature sensor in the controller or in the remote control unit. A prerequisite is that the controller is wall-mounted or the VR 81/2 remote control unit is connected.

Set-back temperature

The set-back temperature is the temperature to which your heating system reduces the room temperature outside set period.

Soft key function

The function of the function keys switches depending on the menu you are currently in.

The current functions of the function keys are displayed in the bottom display lines.

Target room temperature (Desired temperature)

The target room temperature is the temperature that you would like in the dwelling and which is specified to the controller. The boiler continues to provide heat until the room temperature is equal to the target room temperature. The target room temperature serves as a guideline for regulating the flow temperature according to the heating curve.

Target values

Target values are desired values that you specify in the controller, e.g. the target room temperature or target temperature for hot water production.

Time periods

Three time periods per day can be set for the heating, hot water production and circulation pump.

Example:

Period 1: Mon 09.00 - 12.00 hrs.

Period 2: Mon 15.00 - 18.30 hrs.

In the heating, each period is allocated a target value, which the heating system maintains during this time.

For hot water generation, the target hot water temperature prevails for all time periods.

In the case of the circulation pump the time periods determine the operating times.

In automatic mode the system is controlled according to the time period settings.

Weather-compensated

The outside temperature is measured by a separate sensor which is mounted in the open air, and the results are transmitted to the controller. At low outside temperatures the controller provides increased heating output; at higher outside temperatures the heating output is reduced.

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