

For the competent person

Installation instructions



## Weather compensator

VRC 700/4

**GB, IE**

**Publisher/manufacturer**

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# 1 Safety

## 1.1 Intended use

In the event of inappropriate or improper use, damage to the product and other property may arise.

The product controls a heating installation with a Vaillant heat generator with an eBUS interface in a way that is weather-controlled and time-dependent.

Intended use includes the following:

- observance of accompanying operating, installation and servicing instructions for the product and any other system components
- installing and fitting the product in accordance with the product and system approval
- compliance with all inspection and maintenance conditions listed in the instructions.

Intended use also covers installation in accordance with the IP class.

Any other use that is not specified in these instructions, or use beyond that specified in this document shall be considered improper use. Any direct commercial or industrial use is also deemed to be improper.

### Caution.

Improper use of any kind is prohibited.

## 1.2 General safety information

### 1.2.1 Risk caused by inadequate qualifications

The following work must only be carried out by competent persons who are sufficiently qualified to do so:

- Installation
- Disassembly
- Installation
- Start-up
- Maintenance
- Repair
- Decommissioning
- ▶ Observe all instructions that are included with the product.
- ▶ Proceed in accordance with the current state of technology.

- ▶ Observe all applicable directives, standards, laws and other regulations.

### 1.2.2 Risk of material damage caused by frost

- ▶ Do not install the product in rooms prone to frost.

### 1.2.3 Danger due to malfunctions

- ▶ Install the controller in a location where it is not covered by 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.
- ▶ At lengths of 10 m or more, mains voltage supply lines must be laid separately from sensor or bus lines.

## 1.3 Selecting the lines

- ▶ Use standard commercial lines for the wiring.
- ▶ Do not use flexible lines for mains voltage supply lines.
- ▶ Use insulation cables for mains voltage supply lines (e.g. NYM 3 x 1.5).

### Line cross-section

Supply line for mains voltage (pump or mixer mains cable)	$\geq 1.5 \text{ mm}^2$
eBUS line (extra-low voltage)	$\geq 0.75 \text{ mm}^2$
Sensor line (extra-low voltage)	$\geq 0.75 \text{ mm}^2$

### Line length

Sensor lines	$\leq 50 \text{ m}$
Bus lines	$\leq 125 \text{ m}$

## 1.4 Regulations (directives, laws, standards)

- ▶ Observe the national regulations, standards, guidelines and laws.

## 2 Notes on the documentation

### 2 Notes on the documentation

#### 2.1 Observing other applicable documents

- ▶ You must observe all the operating and installation instructions included with the system components.

#### 2.2 Storing documents

- ▶ Pass these instructions and all other applicable documents on to the system operator.

#### 2.3 Applicability of the instructions

These instructions apply only to:

##### VRC 700/4 – Article number

Great Britain	0020184838
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#### 2.4 Nomenclature

The following terms are used for simplification:

- Heat pump, for all heat pumps
- Hybrid heat pump, for **VWS 36/4 230V** and **VWL 35/4 S 230 V**
- Controller, as of version **VRC 700**
- Remote control unit, as of version **VR 91**

## 3 Product description

### 3.1 Identification plate

The identification plate is located on the product's PCB and is no longer accessible from the outside after the product has been installed in the boiler or mounted on a wall in the living area.

The identification plate contains the following information:

Information on the identification plate	Meaning
Serial number	For identification
<b>VRC 700/4</b>	Product description
V	Operating voltage
mA	Current consumption

### 3.2 CE label



The CE label shows that the products comply with the basic requirements of the applicable directives as stated on the identification plate.

The declaration of conformity can be viewed at the manufacturer's site.

### 3.3 Checking the scope of delivery

Quantity	Contents
1	Controller
1	<b>VRC 693</b> outside temperature sensor or <b>VRC 9535</b> outside temperature sensor
1	Fastening material (2 bolts and 2 wall plugs)
1	6-way edge connector
1	3-pin pin header connector
1	Documentation

- ▶ Check that the scope of delivery is complete.

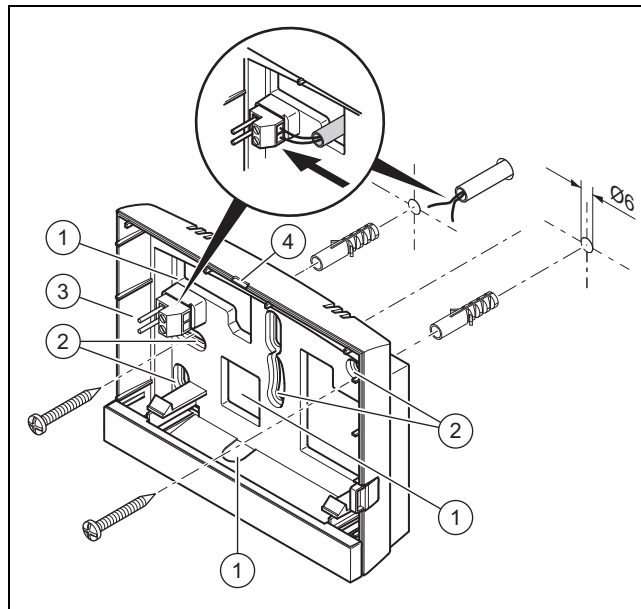
## 4 Installation

You can either install the controller within the boiler or install it separately on a wall in the living area.

### 4.1 Installing the controller in the living room

**Conditions:** Controller PCB without connected 3-pin header

- ▶ Install the controller on an interior wall of the main living room in such a way that perfect recording of the room temperature is ensured.
  - Installation height: 1.5 m



- |   |                         |   |   |
|---|-------------------------|---|---|
| 1 | Openings for cable duct | 3 | Pin header with terminals for the eBUS line |
| 2 | Mounting holes          | 4 | Opening slot                                |

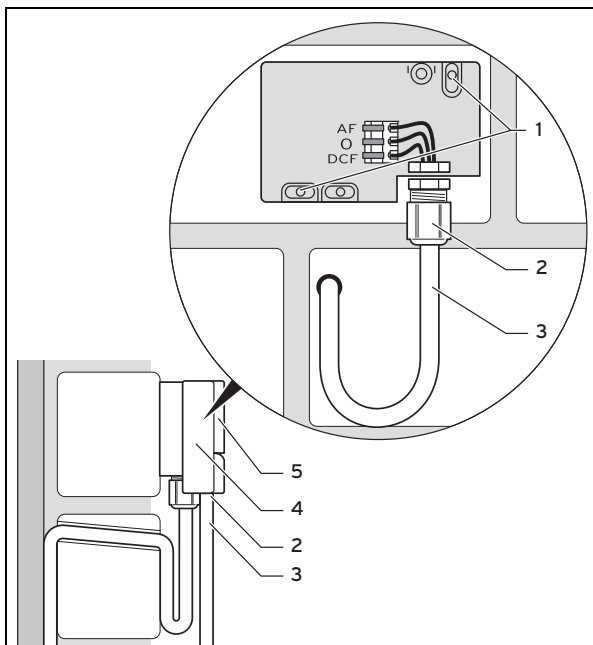
1. Screw in the wall socket in accordance with the illustration.
2. Connect the eBUS line. (→ Page 6)



## 5 Electrical installation

### 2. Alternatives 2 / 2

Conditions: VRC 9535 outside temperature sensor



- ▶ Drill holes in line with the mounting holes (1).
- 3. Route the connection cable (3) in accordance with the illustration.
- 4. Remove the housing cover (5).
- 5. Undo the cap nut (2) and slide the connection cable through the cable duct from below.
- 6. Tighten the cap nut.
  - ◀ The seal in the cable duct adapts to the diameter of the cable used.
- 7. Connect the outside temperature sensor. (→ Page 6)
- 8. Place the seal between the wall-mounting base and the housing cover.
- 9. Secure the housing cover.

## 5 Electrical installation

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

### 5.1 Connecting a controller to the heat generator

1. When opening the electronics box in the heat generator, proceed as described in the installation instructions for the heat generator.
2. Connect the eBUS line to the eBUS terminals in the controller's wall socket.
3. Connect the eBUS line to the eBUS terminals in the heat generator.

### 5.2 Connecting a controller to the ventilation unit

1. When connecting the controller to the ventilation unit, proceed as described in the installation instructions for the ventilation unit.

Conditions: Ventilation unit connected to the eBUS without VR 32, Ventilation unit without Vaillant heat generator

- ▶ Connect the eBUS line to the eBUS terminals in the controller's wall socket.
- ▶ Connect the eBUS line to the eBUS terminals on the ventilation unit.

Conditions: Ventilation unit connected to the eBUS with VR 32, Ventilation unit with one or more Vaillant heat generators

- ▶ Connect the eBUS line to the eBUS terminals in the controller's wall socket.
- ▶ Connect the eBUS line to the common eBUS on the heat generator.
- ▶ Set the address switch for the VR 32 in the ventilation unit to position 3.

### 5.3 Connecting the outside temperature sensor



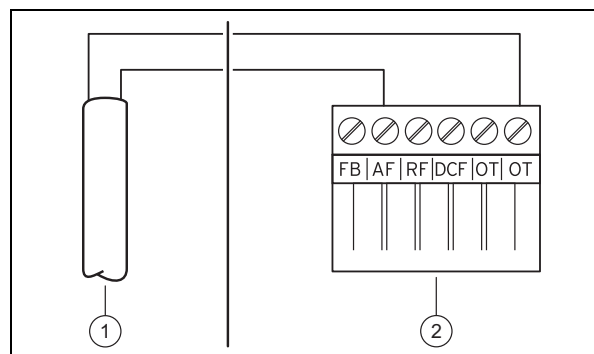
#### Note

If an additional module has been connected, pay attention to the instructions for the additional module when installing the outside temperature sensor electrically.

1. When connecting the outside temperature sensor, proceed as described in the installation instructions for the heat generator.

### 2. Alternatives 1 / 2

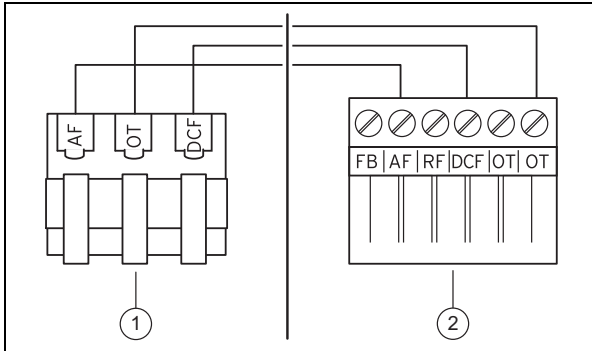
Conditions: VRC 693 outside temperature sensor



- ▶ Connect the connection cable to the terminals on the outside temperature sensor (1).

## 2. Alternatives 2 / 2

Conditions: VRC 9535 outside temperature sensor



- ▶ Connect the connection cable to the terminal block on the outside temperature sensor (1).

3. Connect the connection cable to the 6-pin edge connector on the heat generator (2).
4. Route the connection cable with the 6-pin edge connector into the heat generator's electronics box.
5. Connect the 6-pin edge connector to slot X41 of the electronics box PCB.

## 6 Start-up

When you are operating the system for the first time after installing the electrical wiring, the installation assistants for the components start automatically. Set the required values for the components first and then for the controller.

Installation assistant (→ Page 25)

After you have run the installation assistant, **Installation complete** appears in the display. If you press the **OK** selection button, you access the system configuration for the installer level.

You set all other values in the installer level and operating level for the operator.

Installer level (→ Page 25)

Operating levels (→ Operating instructions, Appendix A.2)

All settings that you have made via the installation assistant can be changed again at a later date via the operator or installer operating level.

## 7 Handing over to the operator

- ▶ Inform the operator of how to handle and operate their product.
- ▶ Provide the operator with all relevant instructions and unit documentation for safe-keeping.
- ▶ Tell the operator the article number of the product.
- ▶ Go through the operating instructions with the operator.
- ▶ Answer any questions the operator may have.
- ▶ In particular, draw the operator's attention to the safety information that they must follow.
- ▶ Ensure that the operator is familiar with all of the Anti-legionella measures in order to comply with the applicable regulations regarding legionella prevention.

## 8 Operating and display functions



### Note

The functions described in this section are not available for all system configurations.

The controller has a level for the operator and a level for the competent person.

The setting and read-out options for the operator, the operating concept and an operating example are described in the operating instructions for the controller.

The setting and read-out options for the competent person can be found via the selection button **Menu/Installer level** → **Enter code**.

Installer level (→ Page 25)

The path details given at the start of each function description indicate how you reach this function in the menu structure. The square brackets contain the level of detail to which the function belongs.

The description of the functions for **HEATING 1, ZONE1, Heat pump 1, Heat generator 1** and **Solar cylinder 1** applies representatively for all existing heating circuits, zones, heat pumps, heat generators and solar cylinders. If a function applies only for certain heating circuits, zones, heat pumps, heat generators and solar cylinders, this is noted for the function.

### 8.1 Service information

#### 8.1.1 Entering contact details

**Menu** → **Installer level** → **Service information** → **Enter contact details**

- You can enter your contact details (**Installer** and **Phone number**) in the controller.
- As soon as the date of the next service appointment is reached, the operator can view these contact details in the display of the controller.

#### 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 a service appointment is reached, a maintenance message is displayed in the basic display.

### 8.2 System

#### 8.2.1 Reading the fault status

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Fault status**

- This function allows you to read the status of the heating installation. If there is no fault present, the **No fault** message appears. If there is a fault, then **Fault list** appears as a status. If you press the right-hand selection button, the fault messages (→ Page 20) will be displayed.

## 8 Operating and display functions

### 8.2.2 Reading the water pressure of the heating installation

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

- You can use this function to read the water pressure of the heating installation.

### 8.2.3 Reading the system status

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

- You can use this function to read the heating installation's operating mode.

**Standby:** The heating installation does not report any energy requirement.

**Heat. mode:** The heating installation is in heating mode for the heating circuits.

**Cooling:** The heating installation is in cooling mode.

**DHW:** The heating installation is in heating mode for the hot water in the cylinder.

### 8.2.4 Setting the frost protection delay

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

- You can use this function to delay activation of the frost protection function by setting a delay time.

### 8.2.5 Setting the temperature threshold for constant heating

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

- If the outside temperature is lower than or equal to the defined temperature value, the controller regulates the heating circuit with the set day temperature and heating curve, even outside of the time period.

AT ≤ set temperature value: No night set-back or total shut-down

### 8.2.6 Reading the software version

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

- You can use this function to read the software versions of the display, the heat generator and the expansion modules.

### 8.2.7 Activating the adaptive heating curve

Menu → Installer level → System configuration → [System ----] → Adaptive heat. curve

- You can use this function to activate an automatic heating curve.

If you have activated this function using the **Yes** setting, the controller automatically adjusts the heating curve. The automatic adjustment of the heating curve is performed in small steps. Use the **Heating curve** function to adapt the heating curve to the building so that the **Adaptive heat. curve** function still has to carry out the fine adjustment.

The prerequisite for this is:

- The controller is installed in the living room.

- Any remote control unit that is present is installed in the living room
- In the **Zone assignment** function, the controller or, if required, the remote control unit is assigned to the correct zone.
- The **Thermost.** or **Temp. mod.** value is selected for the **Room temp. mod.** function.

### 8.2.8 Configuring the heating circuit

Menu → Installer level → System configuration → [System ----] → Configure heat. circ.

- You can use this function to define the zones on which you want the settings for the operating mode and desired temperature from the operator level to take effect.

Example: Two zones are connected and you set **ZONE1**. For both zones, use the left-hand selection button **Menu** → **Basic settings** → **Operating mode** to activate the **Heating** → **Auto** operating mode. If the operator now uses the right-hand selection button **Op. mode** to change the operating mode to **Day**, the operating mode is changed only for **ZONE1**. The **Auto** operating mode remains in place for **ZONE2**.

### 8.2.9 Activating automatic cooling

Menu → Installer level → System configuration → [System ----] → Automatic cooling

- Use this function to activate or deactivate automatic cooling.

If a heat pump is connected and the **Automatic cooling** function has been activated, the controller automatically switches between heating and cooling.

### 8.2.10 Setting the cooling start temperature

Menu → Installer level → System configuration → [System ----] → Start OT cooling

- You can use this function to set the cooling start temperature. If the outside temperature is greater than the cooling start temperature that is set, cooling mode is possible.

Activating **Cooling possible** (→ Page 14)

### 8.2.11 Activating Source regeneration

Menu → Installer level → System configuration → [System ----] → Source regeneration

- If the **Automatic cooling** function is activated, you can use the **Source regeneration** function.

When the **Days away from home scheduling** function is activated, the controller switches the heating and cooling off. If you also activate the **Source regeneration** function, the controller switches the cooling back on and ensures that the heat from the living area is returned to the ground via the heat pump.

### 8.2.12 Read current room air humidity

Menu → Installer level → System configuration → [System ----] → Current room air hum.

- You can use this function to read the current room air humidity. The room air humidity sensor is installed in the controller.

The function is activated only if the controller is installed in the living room.

## 8.2.13 Reading the current dew point

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Current dew point**

- You can use this function to read the current dew point.

The current dew point is calculated from the current room temperature and room air humidity. The controller obtains the values for calculating the current dew point from the room temperature sensor and room air humidity sensor.

To do this, the controller must be installed in the living area and assigned to a zone. The thermostat function must be activated.

## 8.2.14 Defining the hybrid manager

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Hybrid manager**

- You can use this function to determine the hybrid manager with which the heating installation should be controlled.

The hybrid heat pump always works with the **triVAI** function, meaning that the **Hybrid manager** function does not appear as a list point in the display.

**triVAI**: The price-oriented hybrid manager picks the heat generator on the basis of the rates set in relation to the energy requirement.

**Biv. point**: The bivalence point hybrid manager picks the heat generator on the basis of the outside temperature.

## 8.2.15 Setting the heating bivalence point

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Heat. bivalence point**

- If the bivalence point is selected for the **Hybrid manager** function, you can then use the **Heat. bivalence point** function.

When outside temperatures are low, an auxiliary heater helps the heat pump to generate the energy required. You can use this function to set the outside temperature above which the auxiliary heater remains switched off.

## 8.2.16 Setting the hot water bivalence point

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **DHW bivalence point**

- When outside temperatures are low, an auxiliary heater helps the heat pump to generate the energy required for hot water generation. You can use this function to set the outside temperature below which the auxiliary heater is enabled.

Irrespective of the affected setting, the auxiliary heater for the Anti-legionella function is activated.

## 8.2.17 Setting the alternative point

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Alternative point**

- If the bivalence point is selected for the **Hybrid manager** function, you can then use the **Alternative point** function.

The function represents the alternative point. When the outside temperature lies below the set temperature value, the controller always switches the heat pump off and the auxiliary heater creates the required energy in heating mode.

## 8.2.18 Setting the limp home mode temperature

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **T. emergency mode**

- If a heat pump is connected, you can use the **T. emergency mode** function.

If the heat pump fails, the auxiliary heater generates the required energy. To avoid high heating costs due to the auxiliary heater, set a low flow temperature.

The operator notices a heat loss and recognises that there is a problem with the heat pump. In addition, the message **Restricted operation/ comfort protection** appears on the display. If the operator releases the auxiliary heater for generating the required energy, the controller overrides the set temperature for limp home mode.

You cannot use this function with the hybrid heat pump and it therefore does not appear in the listbox.

## 8.2.19 Defining the boiler type

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Auxiliary heater type**

- If the **triVAI** entry is selected for the **Hybrid manager** function, you can then use the **Auxiliary heater type** function.

This function allows you to select which heat generator, apart from the heat pump, is still installed.

To ensure that the heat pump and additional heat generator can work effectively and in coordination, you must select the applicable heat generator. If the heat generator setting is incorrect, this may lead to increased costs for the operator.

## 8.2.20 Deactivating units at the request of the energy supply company

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Energy supplier**

- The energy supply company can use this function to send a deactivation signal.

The deactivation signal relates to the heat pump, the auxiliary heater and the system's heating and cooling functions. You can specify which units and functions are deactivated by the controller. The units and functions specified are deactivated until the energy supply company cancels the deactivation signal.

The heat generator ignores the deactivation signal as soon as the heat generator is in frost protection mode.

## 8.2.21 Selecting the type of auxiliary heater support

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Auxiliary heater for**

- You can use this function to specify whether the auxiliary heater should support the heat pump for hot water, heating or not at all.
- **DHW**: Supports the heat pump during hot water generation

## 8 Operating and display functions

The auxiliary heater is activated for frost protection or de-icing the heat pump.

- **Heating:** Supports the heat pump during heating  
The auxiliary heater is activated for the Anti-legionella function.
- **DHW+heat.:** Supports the heat pump during hot water generation and heating
- **Inactive:** No support is provided to the heat pump  
The auxiliary heater is activated for the Anti-legionella function, frost protection or de-icing.

If the auxiliary heater is inactive, the system cannot guarantee comfort.

You cannot use this function with the hybrid heat pump and it therefore does not appear in the listbox.

### 8.2.22 Reading the system flow temperature

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **System flow temp.**

- You can use this function to read the current temperature of the low loss header, for example.

### 8.2.23 Setting the offset for the buffer cylinder

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Buff. cyl. offs.**

- If a heat pump is connected, you can use this function to set an offset value (K) for the buffer cylinder for the heating circuit.

The buffer cylinder is charged to the flow temperature + the set offset value when the **PV** entry is activated for the **Multi-funct. Input** function.

### 8.2.24 Activating the actuation sequence for the cascade

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Actuation reversal**

- If the system contains a cascade, you can use the **Actuation reversal** function.
- **Off:** The controller always actuates the heat generators in the sequence 1, 2, 3, etc.
- **On:** This function is used to ensure that the heat generators are used evenly. Once a day, the controller sorts the heat generators based on their actuation time. The auxiliary heater is excluded from this sorting.

### 8.2.25 Reading the actuation sequence for the cascade

**Menu** → **Installer level** → **System configuration** → [**System** ----] → **Actuation sequence**

- You can use this function to read the sequence in which the controller actuates the heat generators. The auxiliary heater is not affected by this actuation sequence and is therefore not listed.

## 8.3 Configuring the system diagram

Each heating installation is based on a system diagram with corresponding connection diagram. A separate system diagram book contains the system diagram and the corresponding connection diagrams with explanations.

Download the system diagram book from Vaillant's website.

### System diagram book:

Document number	0020200783
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#### 8.3.1 Defining the system diagram

**Menu** → **Installer level** → **System configuration** [**System diagram configuration** ----] → **System diagram**

- You use this function to define the system diagram in the controller.

The selected system diagram must match the heating installation that is installed. The system diagram book contains the possible system diagrams along with a system diagram number. You must enter the system diagram number in the controller.

#### 8.3.2 Configuring the inputs and outputs of the VR 71

**Menu** → **Installer level** → **System configuration** [**System diagram configuration** ----] → **Config.: VR71**

- You can use this function to configure which inputs and outputs you can use and which functions the inputs and outputs have.

Each configuration has a unique setting value, which you need to enter in the **Config.: VR71** function. You can find the set value and the terminal assignment for the selected system diagram in the system diagram book.

Connecting the sensors to **VR 71** (→ Page 31)

Connecting the actuators to **VR 71** (→ Page 31)

#### 8.3.3 Configuring the inputs and outputs of the VR 70

**Menu** → **Installer level** → **System configuration** [**System diagram configuration** ----] → **Config.: VR70 addr. 1**

- You can use this function to configure which inputs and outputs you can use and which functions the inputs and outputs have.

Each configuration has a unique setting, which you need to enter in the **Config.: VR70 addr. 1** function. You can find the set value and the terminal assignment for the selected system diagram in the system diagram book.

Connecting the actuators and sensors to **VR 70** (→ Page 30)

#### 8.3.4 Configuring the VR 70's multi-function output

**Menu** → **Installer level** → **System configuration** [**System diagram configuration** ----] → **MA VR70, addr. 1**

- You can use this function to set which functions are to be assigned to the multi-function output.

Connecting the actuators and sensors to **VR 70** (→ Page 30)

If you have set configuration 3 (**Config.: VR70 addr. 1**) for the **VR 70**, you cannot set **Charg.pump** or **Leg. pump**.

The **MA VR70, addr. 1** function does not appear on the display if the functions of the multi-function output have been defined by the system configuration.

## 8.3.5 Configuring the VR 71's multi-function output

**Menu** → **Installer level** → **System configuration [System diagram configuration ----]** → **MA VR71**

- You can use this function to set which functions are to be assigned to the multi-function output.

Connecting the sensors to **VR 71** (→ Page 31)

Connecting the actuators to **VR 71** (→ Page 31)

If you have set configuration 3 (**Config.: VR71**) for the **VR 71**, you cannot set **TD con..** For configuration 6, you cannot set **Charg.pump, Leg. pump** or **TD con..**

The **MA VR71** function does not appear in the display if the functions of the multi-function output have been set by the system configuration.

## 8.4 Additional module

### 8.4.1 Configuring the multi-function output

**Menu** → **Installer level** → **System configuration [Additional module ----]** → **Multi-funct. output 2**

- You can use the multi-function output 2 to control the circulation pump, dehumidifier or legionella protection pump.

Depending on the system diagram specified, multi-function output 2 is specified with a single function, or you can set a function from a selection of two or three.

### 8.4.2 Setting the auxiliary heater output

**Menu** → **Installer level** → **System configuration [Additional module ----]** → **Aux. heater output**

- If you have connected an **aroTHERM**, you can use this function **Aux. heater output**. You can use this function to set the level (max. output) at which the auxiliary heater should work when heat is required.

You can operate the auxiliary heater at three different levels (outputs).

### 8.4.3 Configuring the multi-function input

**Menu** → **Installer level** → **System configuration [Additional module ----]** → **Multi-funct. Input**

- If a heat pump is connected, you can use the **Multi-funct. Input** function. The controller requests the heat pump's input for this purpose.
- Input for the **aroTHERM** is: ME of the additional module VWZ-AI
- Input for the **flexoTHERM** is: X41, terminal in the functional drawing

If there is a signal at the input of the heat pump, the following functionalities are possible.

**Not conn.:** The controller does not activate any functions. The controller ignores the signal present.

**Circ. boost:** The operator has pressed the circulation button. The controller activates the circulation pump for a short time period.

**PV:** The connected photovoltaic system generates surplus current, which is intended to be used for the heating installation. The controller activates the **Cylinder boost** function once. If the signal remains at the input, the controller activates the charging of the buffer cylinder in the heating circuit. The buffer cylinder is charged to the flow temperature and an offset, see Setting the offset for the buffer cylinder (→ Page 10), until the signal at the input of the heat pump falls again.

## 8.5 Heat generator 1, heat pump 1, additional module

### 8.5.1 Reading the status

**Menu** → **Installer level** → **System configuration [Heat generator 1 ----]** → **Status**

**Menu** → **Installer level** → **System configuration [Heat pump 1 ----]** → **Status**

**Menu** → **Installer level** → **System configuration [Additional module ----]** → **Status**

- You can use this function to read which requirement the controller reports to the heat generator, the heat pump or the additional module for the heat pump.

**Standby:** The controller does not report any energy requirement.

**Heat. mode:** The controller reports an energy demand for heating mode.

**Cooling:** The controller reports an energy demand for cooling mode.

**DHW:** The controller reports an energy demand for hot water generation.

### 8.5.2 Reading the current flow temperature

**Menu** → **Installer level** → **System configuration [Heat generator 1 ----]** → **Current flow temp.**

**Menu** → **Installer level** → **System configuration [Heat pump 1 ----]** → **Current flow temp.**

**Menu** → **Installer level** → **System configuration [Additional module ----]** → **Current flow temp.**

- You can use this function to read the current actual flow temperature of the heat generator, the heat pump or the heat pump's additional module.

## 8.6 HEATING 1

You can use the heating circuit for various functions (heating circuit, pool circuit, fixed value circuit, etc.). The display only shows the functions that you require when using the heating circuit. You can use the overview to see which functions you can set or read for your configuration.

Functions for the heating circuit (→ Page 29)

### 8.6.1 Setting Type of circuit

**Menu** → **Installer level** → **System configuration** → **[HEATING1 ----]** → **Type of circuit**

- You can use this function to define the functions that the heating circuit is to have.

The first heating circuit in the system has the default setting **Heating**. All other heating circuits have the default setting **Inactive**, which you may have to activate.

## 8 Operating and display functions

**Inactive:** The heating circuit is not being used.

**Heating:** The heating circuit is being used to heat and is weather-controlled. Depending on the system diagram, the heating circuit may be a mixer circuit or a direct circuit.

**Pool:** The heating circuit is being used as a pool circuit. You can connect the external pool controller to the DEM1 to DEMx input on the **VR 70** or **VR 71**. If the terminals at the input have short-circuited, there is no heat demand. If the terminals at the input are open, there is a heat demand.

**Fixed val.:** The heating circuit is maintained at two fixed target flow temperatures. The heating circuit can be switched between two target flow temperatures.

**Ret.fl.incr.:** The heating circuit is used for the increase in return flow. The increase in return flow is used to protect against corrosion in the floor-standing boiler as a result of falling below the dew point for an extended period.

**DHW:** The heating circuit is being used as a hot water circuit for an additional cylinder.

Depending on the **Type of circuit** that is selected, only the corresponding functions appear on the display as list entries.

### 8.6.2 Reading the status of the heating circuit

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Status**

- You can use this function to read the operating mode for **HEATING1**.

**off:** The heating circuit does not report any energy requirement.

**Heat. mode:** The heating circuit is in heating mode.

**Cooling:** The heating circuit is in cooling mode.

**DHW:** The heating circuit is in heating mode for the hot water in the cylinder.

### 8.6.3 Reading the heating circuit's target flow temperature

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Target flow temp.**

- You can use this function to read the target flow temperature for the heating circuit.

### 8.6.4 Reading the target flow temperature of the pool circuit

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Target flow temp. pool**

- You can use this function to read the target flow temperature of the pool circuit.

### 8.6.5 Setting the day target flow temperature for the pool circuit or fixed value circuit

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Target flow temp.: Day**

- You can use this function to set the target flow temperature for the pool circuit or fixed value circuit for the day (within a time period).

### 8.6.6 Setting the set-back target flow temperature for the pool circuit or fixed value circuit

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **T.fl.temp.: Set-back**

- You can use this function to set the target flow temperature for the pool circuit or fixed value circuit for the night (outside of the time period).

### 8.6.7 Setting the target return temperature for the "increase in return flow" circuit type

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Target return temp.**

- You can use this function to set the target return temperature for the "increase in return flow" circuit type.

### 8.6.8 Setting the minimum cooling flow target value

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Min. cool. fl. tgt temp.**

- If a heat pump is connected and the **Cooling possible** function is activated for the heating circuit, you can set the minimum target flow value for the **Cooling possible** mode.

The controller regulates the heating circuit at the minimum cooling target flow value, even if the operator has set a lower desired temperature for cooling.

### 8.6.9 Reading the current temperature

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Current temperature**

- You can use this function to read the current temperature of the heating circuit.

### 8.6.10 Setting the excess temperature

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Excessive temp.**

- You can use this function to set the excess temperature. The excess temperature increases the current set target temperature of the heating circuit by the value that is set.

On mixer circuits with fixed mixing, this function means that the set target temperature can be reached in pre-heat mode, even though the temperature of the mixer circuit drops substantially.

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

### 8.6.11 Setting the temperature threshold for deactivating the heating circuit

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Max limit outs.temp.**

- You can use this function to set the temperature threshold. If the outside temperature is greater than the switch-off threshold set, the controller deactivates heating mode.

### 8.6.12 Setting the minimum flow temperature for the heating circuit

Menu → Installer level → System configuration → [HEATING1 ----] → Minimum temperature

- You can use this function to specify a minimum value for the flow temperature in heating mode for each heating circuit; the control system will not fall below this value. The controller compares the calculated flow temperature with the value set for the minimum temperature and, if there is a difference, adjusts this to the higher value.

### 8.6.13 Setting the maximum flow temperature for the heating circuit

Menu → Installer level → System configuration → [HEATING1 ----] → Maximum temperature

- You can use this function to specify a maximum value for the flow temperature in heating mode for each heating circuit; the control system will not exceed this value. 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.

### 8.6.14 Specifying controller behaviour outside time periods

Menu → Installer level → System configuration → [HEATING1 ----] → Auto Off mode

- This function enables you to specify, for each heating circuit separately, the controller functions in automatic mode outside active time periods. Default setting: **Eco**

You can select from two controller behaviours, which you can adapt further by using the room temperature control.

If you have set the **Thermost.** value in the **Room temp. mod.** function, the **Auto Off mode** function is ineffective. The controller always brings the target room temperature to 5 °C.

- **Eco:** The operating mode **Auto Off mode**, **Auto** (outside of the time period) and **off** are switched off. If a mixer circuit is connected, the heating pump is switched off and the heating circuit mixer is closed. The outside temperature is monitored. If the outside temperature falls below 4 °C, the controller switches the heating function on after the end of the frost protection delay time. The heating pump is activated. If a mixer circuit is connected, the heating pump and the heating circuit mixer are activated. The controller regulates the target room temperature at the set temperature **Set-back**. Despite the heating function being switched on, the heat generator 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.
- **Set-back:** The heating function is switched on and the target room temperature is set to and maintained at the set **Set-back** temperature.

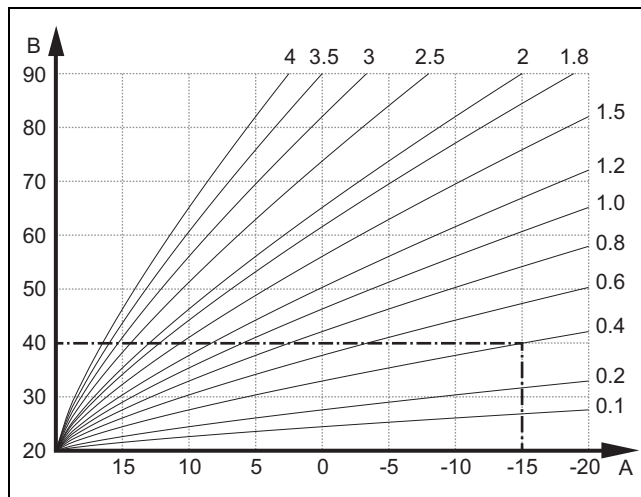
### 8.6.15 Setting the heating curve

Menu → Installer level → System configuration → [HEATING1 ----] → Heating curve

- If the heating curve setting is not sufficient to control the living room climate according to the operator's wishes,

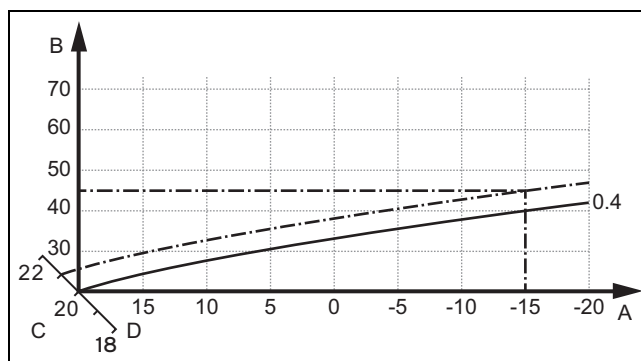
you can adapt the heating curve setting made during installation.

If you activate the **Adaptive heat. curve** function, you must always adjust the value for the heating curve to the heating surface design.



A Outside temperature °C B Target flow temperature °C

The illustration shows the possible heating curves of 0.1 to 4.0 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.



A Outside temperature °C B Target flow temperature °C C Target room temperature °C D Axis a

If the heating curve 0.4 is selected and 21 °C is specified for the target room temperature, the heating curve is then translated, as shown in the figure. The heating curve is displaced according to the value of the room target temperature along axis a which is angled at 45°. At an outside temperature of -15 °C, the control system provides a flow temperature of 45 °C.

### 8.6.16 Activating Room temp. mod.

Menu → Installer level → System configuration → [HEATING1 ----] → Room temp. mod.

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

The prerequisite for this is:

- The controller is installed in the living room.

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- Any remote control unit that is present is installed in the living room.
- In the **Zone assignment** function, the controller or, if required, the remote control unit is assigned to the zone in which the controller or remote control unit is installed. If you do not assign any zones, the **Room temp. mod.** function is ineffective.

**None:** Temperature sensor is not used for control.

**Temp. mod.:** 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 flow temperature by means of the so-called "Effective target room temperature". Effective room temp. target = set room temp. target + (set room temp. target - measured room temp. target). The effective target room temperature is then used for controlling instead of the set target room temperature.

**Thermost.:** Works in the same way as temperature control, however the zone is also switched off when the measured room temperature is + 3/16 K greater than the set target room temperature. When the room temperature falls + 2/16 K back below the target room temperature set, the zone 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.

### 8.6.17 Activating Cooling possible

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Cooling possible**

- When a heat pump is connected, you can activate the **Cooling** function for the heating circuit .

### 8.6.18 Activating the dew point monitoring

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Dew point monitoring**

- You can use this function to activate the dew point monitoring.

If the dew point monitoring has been activated, the controller compares the set minimum cooling target flow value with the dew point+offset. The controller always selects the higher temperature so that no condensate can form.

### 8.6.19 Setting the end cooling temperature

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **End OT cooling**

- You can use this function to set the temperature threshold from which cooling switches off. If the outside temperature is lower than the temperature threshold set, the controller ends cooling mode.

### 8.6.20 Setting the dew point offset

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Offset dew point**

- You can use this function to set the dew point offset.

The offset is a safety margin that is added to the dew point. The controller selects the maximum for the flow temperature calculated from the flow temperature that is set and the dew point + offset.

### 8.6.21 Reading the status of the external heat demand

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Status ext. heat dem.**

- You can use this function to read the status on the external input to see whether there is a heat demand.

Depending on the configuration of the **VR 70** or **VR 71**, there is one external input for each heating circuit. You can connect an external zone controller, for example, to this external input.

### 8.6.22 Reading the heating pump status

**Menu** → **Installer level** → **System configuration** → [HEATING1 ----] → **Pump status**

- You can use this function to read the current status (**On, off**) of the heating pump for the heating circuit.

### 8.6.23 Reading the status of the heating circuit mixer

**Menu** → **Installer level** → **System configuration** → [HEATING2 ----] → **Mixer status**

- You can use this function to read the current status (**Opening, Closing, Stationary**) of the heating circuit mixer from **HEATING2**.

## 8.7 ZONE1

### 8.7.1 Deactivating the zone

**Menu** → **Installer level** → **System configuration** → [ZONE1 ----] → **Zone activated**

- You can use this function to deactivate the zone that you do not require.

All available zones appear on the display if the existing heating circuits are activated in the **Type of circuit** function.

Setting the type of circuit (→ Page 11)

### 8.7.2 Setting the day temperature

**Menu** → **Installer level** → **System configuration** → [ZONE1 ----] → **Day temperature**

- You can use this function to set the required day temperature for the zone.

### 8.7.3 Setting the set-back temperature

**Menu** → **Installer level** → **System configuration** → [ZONE1 ----] → **Set-back temp.**

- You can use this function to set the required set-back temperature for the zone.

The set-back temperature is the temperature to which the heating is to be reduced at times of low heat demand (e.g. overnight).

### 8.7.4 Reading the room temperature

**Menu** → **Installer level** → **System configuration** → [ZONE1 ----] → **Room temperature**

- If the controller is installed outside of the heat generator and is assigned to a zone, you can read the current room temperature.

The controller has an integrated temperature sensor, which determines the room temperature.

## 8.7.5 Assigning a zone

**Menu** → **Installer level** → **System configuration** → [ZONE1 ----] → **Zone assignment**

- You can use this function to assign the unit (controller or remote control unit) that is installed in the zone to the selected zone. The control system also uses the room temperature sensor for the assigned unit.

If you have assigned a remote control unit, the remote control unit uses all of the values for the assigned zone.

If you do not assign any zones, the **Room temp. mod.** function is ineffective.

## 8.7.6 Reading the zone valve status

**Menu** → **Installer level** → **System configuration** → [ZONE1 ----] → **Zone valve status**

- You can use this function to read the current status of the zone valve (**Open, Closed**).

## 8.8 DHW circuit

### 8.8.1 Setting the cylinder

**Menu** → **Installer level** → **System configuration** [DHW circuit ----] → **Cylinder**

- You can use this function to activate or deactivate a cylinder for the hot water circuit.

If a cylinder is connected to the heating installation, the setting must always be active.

### 8.8.2 Reading the hot water circuit's target flow temperature

**Menu** → **Installer level** → **System configuration** → [DHW circuit ----] → **Target flow temp.**

- You can use this function to read the target flow temperature of the hot water circuit.

### 8.8.3 Setting the cylinder set target temperature (domestic hot water)

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

**Menu** → **Installer level** → **System configuration** [HEATING1 ----] → **Domestic hot water**

- You can use this function to define the desired set target temperature for a connected domestic hot water cylinder (**Domestic hot water**). Set the set target temperature on the controller in such a way that the heat demand of the operator is covered.

### 8.8.4 Reading the current temperature of the domestic hot water cylinder

**Menu** → **Installer level** → **System configuration** [DHW circuit ----] → **Current cyl. temp.**

**Menu** → **Installer level** → **System configuration** [HEATING1 ----] → **Current cyl. temp.**

- You can use this function to read the measured cylinder temperature.

### 8.8.5 Reading the status of the cylinder charging pump

**Menu** → **Installer level** → **System configuration** [DHW circuit ----] → **Cyl. charging pump**

**Menu** → **Installer level** → **System configuration** [HEATING1 ----] → **Cyl. charging pump**

- You can use this function to read the status of the cylinder charging pump (**On, off**).

### 8.8.6 Reading the status of the circulation pump

**Menu** → **Installer level** → **System configuration** [DHW circuit ----] → **Circulation pump**

- You can use this function to read the status of the circulation pump (**On, off**).

### 8.8.7 Defining the day for the Anti-legionella function

**Menu** → **Installer level** → **System configuration** [DHW circuit ----] → **Anti-legionella day**

- You can use this function to define whether the Anti-legionella function is carried out daily or on a specific day.

When the Anti-legionella function is activated, 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. For this, 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 temperature sensor 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 there is no Anti-legionella function.

If **Days away from home scheduling** have been scheduled, the Anti-legionella function is not active on these days. It is activated directly on the first day after the **Days away from home scheduling** period has elapsed and is carried out on the specified day/block of days at the specified **Time** (→ Page 15).

If a heat pump is installed in the heating system, the controller activates the auxiliary heater for the Anti-legionella function.

### 8.8.8 Defining the time for the Anti-legionella function

**Menu** → **Installer level** → **System configuration** [DHW circuit ----] → **Anti-legionella time**

- You can use this function to define the time for executing the Anti-legionella function.

When the time is reached on the defined day, the function starts automatically if **Days away from home scheduling** are not planned.

### 8.8.9 Setting the hysteresis for cylinder charging

**Menu** → **Installer level** → **System configuration** [DHW circuit ----] → **Cyl. boost hysteresis**

## 8 Operating and display functions

- If a heat pump is connected, you can use this function to set a hysteresis for the cylinder charging.

For example: If the desired temperature is set to 55 °C and the temperature difference for cylinder charging is set to 10 K, cylinder charging begins as soon as the cylinder temperature drops to 45 °C.

### 8.8.10 Defining the offset for charging the domestic hot water cylinder

**Menu** → **Installer level** → **System configuration [DHW circuit ----]** → **Cylinder boost offset**

- If a heat pump is connected, you can use this function to specify an offset value (K) for the set hot water temperature. The domestic hot water cylinder is then charged to the flow temperature, which equates to the total of the set hot water temperature and this offset value.

### 8.8.11 Setting the maximum cylinder charging time

**Menu** → **Installer level** → **System configuration [DHW circuit ----]** → **Max. cyl. charg. time**

- If a heat pump is connected, you can use this function to set the maximum charge time for which the cylinder is charged without interruption.

The **off** setting means that there is no time limit for the cylinder charging time.

### 8.8.12 Setting the anti-cycling time for the hot water demand

**Menu** → **Installer level** → **System configuration [DHW circuit ----]** → **DHW req. anti-cy time**

- If a heat pump is connected, you can use this function to set a time period in which cylinder charging is blocked.

If the maximum cylinder charging time is reached but the domestic hot water cylinder connected has not yet reached its set target temperature, the **DHW req. anti-cy time** function takes effect.

### 8.8.13 Defining the run-on time for the cylinder charging pump

**Menu** → **Installer level** → **System configuration [DHW circuit ----]** → **Ch. pump overrun time**

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

When the set hot water temperature (cylinder charging) is reached, the controller switches off the heat generator. The run-on time for the cylinder charging pump starts. The controller automatically deactivates the cylinder charge pump after the run-on time has elapsed.

### 8.8.14 Activating parallel cylinder charging (domestic hot water cylinder and mixer circuit)

**Menu** → **Installer level** → **System configuration [DHW circuit ----]** → **Parallel cyl. charging**

- You can use this function to define, for the connected mixer circuit, that the mixer circuit should continue to be heated during charging of the domestic hot water cylinder.

If the **Parallel cyl. charging** function is activated, the mixer circuits continue to be supplied while the cylinder is being charged. Provided there is an energy demand in the mixer circuit, the controller does not deactivate the heating pump in the mixer circuit. The non-mixed heating circuit is always switched off during cylinder charging.

## 8.9 Buffer cylinder

### 8.9.1 Reading the top cylinder temperature in the buffer cylinder

**Menu** → **Installer level** → **System configuration [Buffer cylinder ----]** → **Cyl. temp.: Top**

- You can use this function to read the current temperature in the upper section of the buffer cylinder.

### 8.9.2 Reading the bottom cylinder temperature in the buffer cylinder

**Menu** → **Installer level** → **System configuration [Buffer cylinder ----]** → **Cyl. temp.: Bottom**

- You can use this function to read the current temperature in the lower section of the buffer cylinder.

### 8.9.3 Reading the top cylinder temperature for hot water in the buffer cylinder

**Menu** → **Installer level** → **System configuration [Buffer cylinder ----]** → **DHW temp. sensor, top**

- You can use this function to read the current temperature in the upper section of the buffer cylinder's hot water component.

### 8.9.4 Reading the bottom cylinder temperature for hot water in the buffer cylinder

**Menu** → **Installer level** → **System configuration [Buffer cylinder ----]** → **DHW tmp. sensor, bot.**

- You can use this function to read the current temperature in the lower section of the buffer cylinder's hot water component.

### 8.9.5 Reading the top cylinder temperature for heating in the buffer cylinder

**Menu** → **Installer level** → **System configuration [Buffer cylinder ----]** → **Heat. temp. sens., top**

- You can use this function to read the current temperature in the upper section of the buffer cylinder's heating component.

### 8.9.6 Reading the bottom cylinder temperature for heating in the buffer cylinder

**Menu** → **Installer level** → **System configuration [Buffer cylinder ----]** → **Heat. temp. sens., bot.**

- You can use this function to read the current temperature in the lower section of the buffer cylinder's heating component.

## 8.9.7 Setting the max. target flow temperature in the buffer cylinder

Menu → Installer level → System configuration [Buffer cylinder ----] → Max.DHW fl.targ.temp.

- You can use this function to set the buffer cylinder's maximum target flow temperature for the domestic hot water unit. The max. target flow temperature that is to be set must be lower than the max. flow temperature for the heat generator. While the cylinder's set target temperature is not reached, the controller does not allow the heat generator to go into heating mode.

You can find the maximum target flow temperature that the heat generator can achieve in the installation instructions for the heat generator.

If the max. target flow temperature that is set is too low, the domestic hot water unit cannot provide the required hot water temperature for the cylinder.

## 8.10 Solar circuit

### 8.10.1 Reading the collector temperature

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

- You can use this function to read the current temperature on the collector temperature sensor.

### 8.10.2 Reading the status of the solar pump

Menu → Installer level → System configuration → [Solar circuit ----] → Solar pump status

- You can use this function to read the current status of the solar pump (**On, off**).

### 8.10.3 Reading the running time of the solar pump

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

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

### 8.10.4 Resetting the solar pump running time

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

- You can use this function to reset the total operating hours of the solar pump to zero.

### 8.10.5 Reading the value of the solar yield sensor

Menu → Installer level → System configuration → [Solar circuit ----] → Solar yield sensor

- You can use this function to read the current value for the solar yield sensor.

### 8.10.6 Setting the flow rate of the solar circuit

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

- In this function, enter the value for the volume flow. This value is used to calculate the solar yield.

If a **VMS 70** is installed in the system, **VMS 70** supplies the value for the volume flow. The controller ignores the value that is entered in this function.

### 8.10.7 Activating Solar pump boost

Menu → Installer level → System configuration → [Solar circuit ----] → Solar pump boost

- 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. You can use the **Solar pump boost** function to reduce the time delay. When this function is activated, the solar pump is switched on for 15 seconds (solar pump boost) if the temperature at the collector temperature sensor has risen by 2 K/hour. This transports the heated solar fluid to the point of measurement more quickly.

### 8.10.8 Setting the solar circuit protection

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

- 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 demand (e.g. all cylinders fully charged), the temperature in the collector field may rise steeply. If the protection temperature set at the collector temperature 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 (35 K hysteresis).

### 8.10.9 Setting the minimum collector temperature

Menu → Installer level → System configuration → [Solar circuit ----] → Min. collector temp

- You can use this function to set the minimum collector temperature.

Defining the switch-on differential for solar charging (→ Page 18)

### 8.10.10 Setting the purging time for the solar circuit

Menu → Installer level → System configuration → [Solar circuit ----] → Purging time

- This function supports the purging of the solar circuit.

The controller stops the function once the specified purging time has elapsed, the solar circuit protection function is active or the max. cylinder temperature has been exceeded.

### 8.10.11 Reading the current flow rate for the VMS 70

Menu → Installer level → System configuration → [Solar circuit ----] → Current flow rate

- You can use this function to read the measured flow rate (volume flow) for the **VMS 70**.

## 8 Operating and display functions

### 8.11 Solar cylinder 1

#### 8.11.1 Defining the switch-on differential for solar charging

Menu → Installer level → System configuration → [Solar cylinder 1 ----] → Switch-on diff.

- This function allows you to define a differential value for starting solar charging. The temperature difference is measured between the lower cylinder temperature sensor and the collector temperature sensor.

If the temperature difference exceeds the differential value set and the minimum collector temperature set, the controller switches the solar pump on. The solar cylinder is charging. The differential value can be defined separately for two connected solar cylinders.

#### 8.11.2 Defining the switch-off differential for solar charging

Menu → Installer level → System configuration → [Solar cylinder 1 ----] → Switch-off diff.

- This function allows you to define a differential value for stopping solar charging. The temperature difference is measured between the lower cylinder temperature sensor and the collector temperature sensor.

If the temperature difference falls below the differential value that is set, the controller switches the solar pump off. The solar cylinder is no longer charged. The off temperature differential value must be at least 1 K less than the set on temperature differential value.

#### 8.11.3 Defining the maximum temperature for solar cylinder

Menu → Installer level → System configuration → [Solar cylinder 1 ----] → Maximum temperature

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

If the maximum temperature set on the bottom cylinder temperature sensor is exceeded, the controller switches the solar pump off. Solar charging is only enabled again once the temperature at the bottom cylinder temperature sensor has fallen by between 1.5 K and 9 K, depending on the maximum temperature. The maximum temperature set must not exceed the maximum permissible cylinder water temperature of the cylinder that is used.

#### 8.11.4 Reading the value for the bottom cylinder temperature sensor

Menu → Installer level → System configuration → [Solar cylinder 1 ----] → Cyl. temp.: Bottom

- You can use this function to read the current measured value for the bottom cylinder temperature sensor.

### 8.12 2nd temperature difference control

#### 8.12.1 Defining the switch-on differential for the second temperature difference control

Menu → Installer level → System configuration → [2nd temperature difference control ----] → Switch-on diff.

- You can use this function to define a differential value for starting the temperature difference control, such as solar heating support.

If the difference between temperature difference sensor 1 and temperature difference sensor 2 exceeds the specified switch-on differential and the minimum temperature at temperature difference sensor 1, the controller then controls the temperature difference output. The temperature difference control starts.

#### 8.12.2 Defining the switch-off differential for the second temperature difference control

Menu → Installer level → System configuration → [2nd temperature difference control ----] → Switch-off diff.

- You can use this function to define a differential value for stopping the temperature difference control, such as solar heating support.

If the difference between temperature difference sensor 1 and temperature difference sensor 2 falls below the specified switch-off differential or exceeds the maximum temperature at temperature difference sensor 2, the controller then controls the temperature difference output. The temperature difference control stops.

#### 8.12.3 Setting the minimum temperature

Menu → Installer level → System configuration → [2nd temperature difference control ----] → Minimum temperature

- You can use this function to set the minimum temperature in order to start the temperature difference control.

Defining the switch-on differential for the second temperature difference control (→ Page 18)

#### 8.12.4 Setting the maximum temperature

Menu → Installer level → System configuration → [2nd temperature difference control ----] → Maximum temperature

- You can use this function to set the maximum temperature in order to stop the temperature difference control.

Defining the switch-off differential for the second temperature difference control (→ Page 18)

#### 8.12.5 Reading the value for temperature difference sensor 1

Menu → Installer level → System configuration → [2nd temperature difference control ----] → TD1 sensor

- You can use this function to read the current measured value for temperature difference sensor 1 (TD1).

#### 8.12.6 Reading the value for temperature difference sensor 2

Menu → Installer level → System configuration → [2nd temperature difference control ----] → TD2 sensor

- You can use this function to read the current measured value for temperature difference sensor 2 (TD2).

## 8.12.7 Reading the status of the temperature difference control

Menu → Installer level → System configuration → [2nd temperature difference control ----] → TD output

- You can use this function to read the status of the temperature difference control.

## 8.13 Ventilation

### 8.13.1 Reading the air quality sensor

Menu → Installer level → System configuration → [Ventilation ----] → Air quality sensor 1/2

- You can use this function to read the measured values from the air quality sensor.

### 8.13.2 Setting the maximum value for air quality sensor

Menu → Installer level → System configuration → [Ventilation ----] → Max. air qual. sensor

- You can use this function to set a maximum value for the air quality.

If the air quality exceeds the maximum value specified, the controller activates the **recoVAIR.../4** ventilation unit accordingly. You will find a detailed description of functions in the **recoVAIR.../4** manual.

## 8.14 Selecting the expansion module for sensor/actuator test

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

- 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 move a mixer valve 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 rate, etc.).

## 8.15 Activating the screed-drying function



### Note

All heat pumps except for the hybrid heat pump are used for screed drying.

Menu → Installer level → Screed-drying function → HEATING1

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

When screed 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.

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

The display shows the current day and the target flow temperature. You can manually set the current day.

The day is always changed at 00:00, irrespective of when the function starts.

After a mains Off/On, screed 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).

## 9 Fault messages and faults

### 8.16 Changing the code for Installer level


Menu → Installer level → Change code

- You can use this function to change the access code for the **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.

## 9 Fault messages and faults

### 9.1 Fault messages

If a fault occurs in the heating installation,  will appear in the display together with a fault message.

You can also read all current error messages under the following menu point:

Menu → Installer level → System configuration → [System ---] → Fault status

- If a fault is present, the status **Fault list** is displayed. In this case, the right-hand selection button is for the **Display** function. You can press the right-hand selection button to display the list of fault messages.



#### Note

Not all fault messages in the list will appear automatically on the basic display.

Fault messages (→ Appendix C.1)

Faults (→ Appendix C.2)

## 10 Decommissioning

### 10.1 Replacing the product

1. Decommission the heating installation if you want to replace the product.
2. Decommission the heat generator, as described in the heat generator's installation instructions.

#### 10.1.1 Removing from the wall

1. Insert the screwdriver into the slot on the wall-mounting base.
2. Carefully lever the controller off the wall-mounting base.
3. Disconnect the eBUS line from the pin header on the controller and from the terminal block on the heat generator.
4. Unscrew the wall-mounting base from the wall.

#### 10.1.2 Removing from the heat generator

1. If required, open the front panel on the heat generator.
2. Carefully remove the controller from the heat generator's electronics box.
3. Disconnect the 6-pin edge connector at slot X41 on the heat generator.
4. If required, close the front panel on the heat generator.

## 11 Customer service

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

Telephone: 0330 100 3461

## 12 Technical data

### 12.1 Technical data

Max. operating voltage	24 V
Current consumption	< 50 mA
Supply line cross-section	0.75 ... 1.5 mm <sup>2</sup>
Level of protection	IP 20
Protection class	III
Maximum permitted ambient temperature	0 ... 60 °C
Current room air humidity	20 ... 95 %
Height	115 mm
Width	147 mm
Depth	50 mm

### 12.2 Sensor resistances

Temperature (°C)	Resistance (ohms)
-25	2167
-20	2076
-15	1976
-10	1862
-5	1745
0	1619
5	1494
10	1387
15	1246
20	1128
25	1020
30	920
35	831
40	740

## Appendix

### A Setting values for system diagram, VR 70 and VR 71

#### A.1 Configuring the system diagram

Each heating installation is based on a system diagram with corresponding connection diagram. A separate system diagram book contains the system diagram and the corresponding connection diagrams with explanations.

Download the system diagram book from Vaillant's website.

#### System diagram book:

Document number	0020200783
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#### A.2 Gas-/oil-fired condensing unit (eBUS)

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Monovalent domestic hot water cylinder or combi cylinder	Cylinder charging using the condensing unit	1 direct	1		
Monovalent domestic hot water cylinder or combi cylinder	Cylinder charging using the condensing unit Low loss header for heating circuits only	1 direct 1 mixed	1	1	
Monovalent domestic hot water cylinder or combi cylinder	Cylinder charging using the condensing unit Low loss header for heating circuits only	2 mixed	1	5	
Monovalent domestic hot water cylinder or combi cylinder	Cylinder charging using the condensing unit Low loss header for heating circuits only	3 mixed	1		3
Monovalent domestic hot water cylinder or combi cylinder	Low loss header for heating circuits and domestic hot water cylinders	1 direct 1 mixed	2	1	
Monovalent domestic hot water cylinder or combi cylinder	Low loss header for heating circuits and domestic hot water cylinders	3 mixed	2		2

#### A.3 Gas-/oil-fired condensing unit (eBUS) and solar hot water support

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Bivalent domestic hot water cylinder	Cylinder charging using a condensing unit and solar heat	1 direct	1	6	
Bivalent domestic hot water cylinder	Cylinder charging using a condensing unit and solar heat	3 mixed	1		2

#### A.4 Gas-/oil-fired condensing unit (eBUS) and solar hot water and heating support

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Combi storage tank	Hydraulic block Low loss header for heating circuits only	1 mixed	2	12	
Combi storage tank	Hydraulic block Low loss header for heating circuits only	3 mixed	2		2
alISTOR buffer cylinder	Buffer cylinder charging using a condensing unit and solar heat	1 mixed	1	3	
alISTOR buffer cylinder	Buffer cylinder charging using a condensing unit and solar heat	3 mixed	1		6

## A.5 aroTHERM or flexoTHERM

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Monovalent domestic hot water cylinder for heat pump		1 direct	8		
Monovalent domestic hot water cylinder for heat pump		1 direct 1 mixed	8	1	
Monovalent domestic hot water cylinder for heat pump		1 mixed 1 PV	8	1	
Monovalent domestic hot water cylinder for heat pump		2 mixed	8	5	
Monovalent domestic hot water cylinder for heat pump	Buffer cylinder for heating circuits only	3 mixed	8		3

## A.6 aroTHERM and domestic hot water cylinder downstream of low loss header

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Monovalent domestic hot water cylinder for heat pump	Low loss header for heating circuits and cylinders	1 direct 1 mixed	16	1	
Monovalent domestic hot water cylinder for heat pump	Low loss header for heating circuits and cylinders	3 mixed	16		3

## A.7 aroTHERM or flexoTHERM and solar hot water support

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Bivalent domestic hot water cylinder for heat pump	Cylinder charging using a heat pump and solar heat	1 direct	8	6	
Bivalent domestic hot water cylinder for heat pump	Cylinder charging using a heat pump and solar heat	3 mixed	8		2

## A.8 aroTHERM or flexoTHERM and solar hot water and heating support

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
aiIStOR buffer cylinder	Buffer cylinder charging using a heat pump and solar heat	1 mixed	8	3	
aiIStOR buffer cylinder	Buffer cylinder charging using a heat pump and solar heat	3 mixed	8		6

## A.9 aroTHERM with system separation

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Monovalent domestic hot water cylinder for heat pump	Heat exchanger module for heat pump	1 direct	10		
Monovalent domestic hot water cylinder for heat pump	Heat exchanger module for heat pump	1 direct 1 mixed	10	1	
Monovalent domestic hot water cylinder for heat pump	Heat exchanger module for heat pump	2 mixed	10	5	
Monovalent domestic hot water cylinder for heat pump	Heat exchanger module for heat pump	3 mixed	10		3

**A.10 aroTHERM with auxiliary heater and system separation**

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Monovalent domestic hot water cylinder for heat pump	Heat exchanger module for heat pump	1 direct	11		
Monovalent domestic hot water cylinder for heat pump	Heat exchanger module for heat pump	1 direct 1 mixed	11	1	
Monovalent domestic hot water cylinder for heat pump	Heat exchanger module for heat pump	2 mixed	11	5	
Monovalent domestic hot water cylinder for heat pump	Heat exchanger module for heat pump	3 mixed	11		3

**A.11 aroTHERM with system separation and solar hot water support**

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Bivalent domestic hot water cylinder for heat pump	Cylinder charging using a heat pump and solar heat Heat exchanger module for heat pump	1 direct	11	6	
Bivalent domestic hot water cylinder for heat pump	Cylinder charging using a heat pump and solar heat Heat exchanger module for heat pump	3 mixed	11		2

**A.12 geoTHERM 3 kW, hot water generation using a gas-fired condensing boiler (eBUS)**

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Monovalent domestic hot water cylinder or combi cylinder	Cylinder charging using the condensing unit	1 direct	6		
Monovalent domestic hot water cylinder or combi cylinder	Cylinder charging using the condensing unit Hydraulic module	1 direct 1 mixed	6	1	
Monovalent domestic hot water cylinder or combi cylinder	Cylinder charging using the condensing unit 2-zone kit	1 direct 1 mixed	7	1	

**A.13 aroTHERM or flexoTHERM, hot water generation using a gas-fired condensing boiler (eBUS)**

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Monovalent domestic hot water cylinder or combi cylinder	Cylinder charging using the condensing unit Hydraulic module	1 direct 1 mixed	9	1	
Monovalent domestic hot water cylinder or combi cylinder	Cylinder charging using the condensing unit Hydraulic module	2 mixed	9	5	
Monovalent domestic hot water cylinder or combi cylinder	Cylinder charging using the condensing unit Hydraulic module	3 mixed	9		3

## A.14 aroTHERM with system separation, hot water generation using a gas-fired condensing boiler (eBUS)

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Monovalent domestic hot water cylinder for heat pump	Cylinder charging using the condensing unit Heat exchanger module for heat pump	1 direct	10		
Monovalent domestic hot water cylinder for heat pump	Cylinder charging using the condensing unit Heat exchanger module for heat pump	1 direct 1 mixed	10	1	
Monovalent domestic hot water cylinder for heat pump	Cylinder charging using the condensing unit Heat exchanger module for heat pump	2 mixed	10	5	
Monovalent domestic hot water cylinder for heat pump	Cylinder charging using the condensing unit Heat exchanger module for heat pump	2 mixed	10		3

## A.15 aroTHERM or flexoTHERM, hot water generation using a heat pump and gas-fired condensing boiler (eBUS)

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Monovalent domestic hot water cylinder for heat pump	Cylinder charging using a condensing unit and heat pump Hydraulic module	1 direct 1 mixed	12	1	
Monovalent domestic hot water cylinder for heat pump Buffer cylinder	Cylinder charging using a condensing unit and heat pump Buffer cylinder for heating circuits only	2 mixed	12	5	
Monovalent domestic hot water cylinder for heat pump Buffer cylinder	Cylinder charging using a condensing unit and heat pump Buffer cylinder for heating circuits only	3 mixed	12		3

## A.16 aroTHERM with system separation, hot water generation using a heat pump and gas-fired condensing boiler (eBUS)

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Monovalent domestic hot water cylinder for heat pump	Cylinder charging using a condensing unit and heat pump Hydraulic module Heat exchanger module	1 direct 1 mixed	13	1	
aiIstor buffer cylinder	Buffer cylinder charging using a condensing unit and heat pump Hydraulic module Heat exchanger module	2 mixed	13	5	
Monovalent domestic hot water cylinder for heat pump	Cylinder charging using a condensing unit and heat pump Hydraulic module Heat exchanger module	3 mixed	13		3

## A.17 aroTHERM and gas-fired condensing boiler (eBUS), heat pump cascade option

Cylinder	Equipment	Heating circuits	Setting for		
			System diagram	VR 70	VR 71
Buffer cylinder	Domestic hot water cylinder downstream of low loss header/buffer cylinder Buffer cylinder charging using the system controller	1 direct 1 mixed	16	1	
aIISTOR buffer cylinder	Domestic hot water cylinder downstream of low loss header/buffer cylinder Buffer cylinder charging using the system controller	1 direct 1 mixed	16	3	
Buffer cylinder	Domestic hot water cylinder downstream of low loss header/buffer cylinder Buffer cylinder charging using the system controller	3 mixed	16		3
aIISTOR buffer cylinder		3 mixed	16		6

## B Overview of the setting options

### B.1 Installation assistant

Setting	Values		Increment, select	Default setting
	Min.	Max.		
Language			Languages available for selection	English
System diagram	1	16	1	1
Config.: VR70 addr. 1	1	12	1	1
Config.: VR71	1	11	1	3
System configuration <sup>1)</sup>				

1) You can use the **OK** selection button to access the settings for the installer level. You can use the **Back** selection button to return to the previous function in the installation assistant.

### B.2 Installer level

Setting level	Values		Unit	Increment, select	Default setting
	Min.	Max.			
Installer level →					
Enter code	000	999		1	000
Installer level → Service information → Enter contact details →					
Phone number	1	12	Numbers	0 to 9, blank spaces, hyphen	
Installer	1	12	Figures	A to Z, 0 to 9, space	
Installer level → Service information → Service date →					
Next service on			Date		
Installer level → System configuration →					
System ----					
Fault status	Current value*				
Water pressure	Current value		bar		
System status	Current value			Standby, Heat. mode, Cooling, DHW	
Frost protect. delay	0	12	h	1	4

\* If no fault is present, the status is **No fault**. If there is a fault, **Fault list** appears and you can read the fault message in the "Fault messages" section.

Setting level	Values		Unit	Increment, select	Default setting
	Min.	Max.			
OT constant heating	off, -25	10	°C	1	off
Control modules	Display			Software version	
Adaptive heat. curve	Current value			Yes, No	No
Configure heat. circ.				All, Zone	Zone
Automatic cooling				Yes, No	No
Start OT cooling	10	30	°C	1	21
Source regeneration				Yes, No	No
Current room air hum.	Current value		%		
Current dew point	Current value		°C		
Hybrid manager				triVAL, Biv. point	Biv. point
Heat. bivalence point	-30	20	°C	1	0
DHW bivalence point	-20	20	°C	1	-7
Alternative point	off, -20	40	°C	1	off
T. emergency mode	20	80	°C	1	25
Auxiliary heater type				condens., non cond., Electric	condens.
Energy supplier				HP off, BH off, HP&BH off, Heat. off, Cooling off, Ht./cl. off	HP off
Auxiliary heater for				Inactive, Heating, DHW, DHW+heat.	DHW+heat.
System flow temp.	Current value		°C		
Buff. cyl. offs.	0	15	K	1	10
Actuation reversal				Off, On	Off
Actuation sequence	Current sequence of the heat generators without auxiliary heating				
<b>System diagram configuration ----</b>					
System diagram	1	16		1, 2, 6, 7, 8, 9, 10, 11, 12, 13, 16	1
Config.: VR71	1	11		1	3
Config.: VR70 addr. 1	1	12		1	1
MA VR70, addr. 1				No funct., Charg.pump, Circ. pump, Cool.signal, Leg. pump, HC pump	No funct.
MA VR71				No funct., Charg.pump, Circ. pump, Cool.signal, Leg. pump, TD con.	No funct.
<b>Additional module ----</b>					
Multi-funct. output 2				HK-2P, Circ. pump, Dehumid., Zone, Leg. pump	Circ. pump
Aux. heater output				off, Stage 1, Stage 2, Stage 3	Stage 3
Multi-funct. Input				Not conn., Circ. boost, PV	Circ. boost
<b>Heat pump 1 ----</b>					
<b>Heat generator 1 ----</b>					
<b>Additional module ----</b>					
Status	Current value			Standby, Heat. mode, Cooling, DHW	
Current flow temp.	Current value		°C		
<b>HEATING1 ----</b>					
Type of circuit				Inactive, Heating, Fixed val., DHW, Ret.fl.incr.Pool,	Heating
Status	Current value			off, Heat. mode, Cooling, DHW	
* If no fault is present, the status is <b>No fault</b> . If there is a fault, <b>Fault list</b> appears and you can read the fault message in the "Fault messages" section.					

Setting level	Values		Unit	Increment, select	Default setting
	Min.	Max.			
Target flow temp.	Current value		°C		
Target flow temp. pool	Current value		°C		
Target flow temp.: Day	5	90	°C	1	65
T.fl.temp.: Set-back	5	90	°C	1	65
Target return temp.	15	80	°C	1	30
Min. cool. fl. tgt temp.	7	24	°C	1	20
Current temperature	Current value		°C		
Excessive temp.	0	30	K	1	0
Max limit outs.temp.	10	99	°C	1	21
Minimum temperature	15	90	°C	1	15
Maximum temperature	15	90	°C	1	90
Auto Off mode				Eco, Set-back	Eco
Heating curve	0.1	4.0		0.05	1.2
Room temp. mod.				None, Temp. mod., Thermost.	None
Cooling possible	Current value			Yes, No	No
Dew point monitoring	Current value			Yes, No	Yes
End OT cooling	4	25	°C	1	4
Offset dew point	-10	10	K	0.5	2
Status ext. heat dem.	Current value			off, On	
Pump status	Current value			off, On	
Mixer status	Current value			Opening, Stationary, Closing	
<b>ZONE1 ----</b>					
Zone activated	Current zone			Yes, No	
Day temperature	5	30	°C	0.5	20
Set-back temp.	5	30	°C	0.5	15
Room temperature	Current value		°C		
Zone assignment				Without, VRC700, VR91 ad.1, to VR91 ad.3	Without
Zone valve status	Current value			Closed, Open	
<b>DHW circuit</b>					
Cylinder				active, Inactive	active
Target flow temp.	Current value		°C		
Current cyl. temp.	Current value		°C		
Cyl. charging pump	Current value			off, On	
Circulation pump	Current value			off, On	
Anti-legionella day				off, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday, Mon-Sun	off
Anti-legionella time	00:00	24:00	hr:min	00:10	04:00
Cyl. boost hysteresis	3	20	K	0.5	5
Cylinder boost offset	0	40	K	1	25
Max. cyl. charg. time	off, 20	120	min	5	45
DHW req. anti-cy time	0	120	min	5	30
Ch. pump overrun time	0	10	min	1	5
Parallel cyl. charging				off, On	off
<b>Buffer cylinder ----</b>					
Cyl. temp.: Top	Current value		°C		
* If no fault is present, the status is <b>No fault</b> . If there is a fault, <b>Fault list</b> appears and you can read the fault message in the "Fault messages" section.					

Setting level	Values		Unit	Increment, select	Default setting
	Min.	Max.			
Cyl. temp.: Bottom	Current value		°C		
DHW temp. sensor,top	Current value		°C		
DHW tmp. sensor, bot.	Current value		°C		
Heat. temp. sens., top	Current value		°C		
Heat. temp. sens., bot.	Current value		°C		
Max.DHW fl.targ.temp.	60	80	°C	1	80
<b>Solar circuit ----</b>					
Collector temp.	Current value		°C		
Solar pump status	Current value			<b>off, On</b>	
Solar pump runtime	Current value		h		
Reset runtime				<b>No, Yes</b>	<b>No</b>
Solar yield sensor	Current value		°C		
Solar flow volume	0.0	165.0	l/min	0.1	
Solar pump boost				<b>off, On</b>	<b>off</b>
Solar circuit prot.	110	150	°C	1	130
Min. collector temp	0	99	°C	1	20
Purging time	0	600	min	10	
Current flow rate	0.0	165.0	l/min	0.1	
<b>Solar cylinder 1 ----</b>					
Switch-on diff.	2	25	K	1	12
Switch-off diff.	1	20	K	1	5
Maximum temperature	0	99	°C	1	75
Cyl. temp.: Bottom	Current value		°C		
<b>2nd temperature difference control ----</b>					
Switch-on diff.	1	20	K	1	5
Switch-off diff.	1	20	K	1	5
Minimum temperature	0	99	°C	1	0
Maximum temperature	0	99	°C	1	99
TD1 sensor	Current value		°C		
TD2 sensor	Current value		°C		
TD output				<b>off, On</b>	<b>off</b>
<b>Ventilation ----</b>					
Air quality sensor 1	Current value		ppm		
Air quality sensor 2	Current value		ppm		
Max. air qual. sensor	400	3000	ppm	100	1000
<b>Installer level → Sensor/actuator test →</b>					
Unit				<b>No module, VR70 ad.1, VR71</b>	
Actuator				<b>No actuat., R1, to R12</b>	
Sensor				<b>No sensor, S1, to S13</b>	
<b>Installer level → HEATING1 → Screed-drying function →</b>					
Day	00	29	Day	1	00
Temperature	Current value		°C	1	
<b>Installer level → Change code →</b>					
* If no fault is present, the status is <b>No fault</b> . If there is a fault, <b>Fault list</b> appears and you can read the fault message in the "Fault messages" section.					

Setting level	Values		Unit	Increment, select	Default setting
	Min.	Max.			
New code	000	999		1	00

\* If no fault is present, the status is **No fault**. If there is a fault, **Fault list** appears and you can read the fault message in the "Fault messages" section.

### B.3 Functions for the heating circuit

Depending on what the heating circuit is used for (heating circuit/direct circuit, pool circuit, fixed value circuit, etc.), specific functions are available in the controller. You can use the table to read which functions appear on the controller's display for the selected type of circuit.

Available function	Setting for the Type of circuit function					
	Heating		Pool circuit	Fixed value circuit	Increase in return flow	DHW circuit
	Direct circuit	Mixing circuit				
Reading the status of the heating circuit	x	x	x	x	–	–
Reading the target flow temperature	x	x	x	x	–	–
Reading the pool target flow temperature	–	–	x	–	–	–
Setting the day target flow temperature	–	–	x	x	–	–
Setting the set-back target flow temperature	–	–	x	x	–	–
Setting the target return temperature	–	–	–	–	x	–
Setting the hot water	–	–	–	–	–	x
Reading the current temperature	–	x	x	x	x	–
Reading the current cylinder temperature	–	–	–	–	–	x
Setting the excess temperature	–	x	x	x	–	–
Setting the max limit outs.temp.	x	x	x	x	–	–
Setting the heating curve	x	x	–	–	–	–
Setting the minimum flow temperature for the heating circuit	x	x	–	–	–	–
Setting the maximum flow temperature for the heating circuit	x	x	–	–	–	–
Specifying controller behaviour outside time periods	x	x	–	–	–	–
Activating room temperature control	x	x	–	–	–	–
Activating "Cooling possible"	x	x	–	–	–	–
Activating the dew point monitoring	x	x	–	–	–	–
Setting the minimum cooling flow target value	x	x	–	–	–	–
Setting the outside temperature at which to end cooling	x	x	–	–	–	–
Setting the dew point offset	x	x	–	–	–	–
Reading the status of the external heat demand	x	x	x	x	–	–
Reading the heating pump status	x	x	x	x	–	–
Reading the status of the heating circuit mixer	–	–	x	x	x	–
Reading the status of the cylinder charging pump	–	–	–	–	–	x

## C Connecting the actuators, sensors and sensor assignment for the VR 70 and VR 71

### C.1 Legend for connecting the actuators and sensors

Legend point	Meaning	Legend point	Meaning
9e	Hot water generation diverter valve	FSx	Flow temperature sensor for heating circuit x
BH	Auxiliary boiler	9kxcl	Heating circuit mixer is closed for heating circuit x, in combination with 9kxop
BufBt	Lower cylinder temperature sensor in a buffer cylinder	9kxop	Heating circuit mixer is open for heating circuit x, in combination with 9kxcl
BufBtDHW	Bottom cylinder temperature sensor for hot water generation in a buffer cylinder (MSS)	3fx	Heating pump for heating circuit x
BufBtHC	Top cylinder temperature sensor for the heating circuit in a buffer cylinder (MSS)	3h	Legionella protection pump
BufTopDHW	Top cylinder temperature sensor for hot water generation in a buffer cylinder (MSS)	LP/9e	Charging pump or hot water generation diverter valve
BufTopHC	Bottom cylinder temperature sensor for the heating circuit in a buffer cylinder (MSS)	MA	Multi-function output
COL	Collector temperature sensor	PWM	Control signal for the solar pump unit or the feedback signal
COLP	Solar pump	SysFlow	System flow temperature (e.g. in low loss header)
CP	Circulation pump	TD2	Temperature difference sensor 2
DEMx	Input for external requirement for heating circuit x	9g	Diverter valve
DHW1	Cylinder temperature sensor	ZoneOff	2-way valve for switching between zones, in combination with Zone On
DHWBH	Cylinder temperature sensor for the auxiliary heater	ZoneOn	2-way valve for switching between zones, in combination with Zone Off
DHWBt	Lower cylinder temperature sensor	9bx	Zone valve for Zone x
DHWoff	2-way valve for switching to cylinder, in combination with DHWon	Solar Yield	Sensor for the solar yield, installed in the solar circuit return. TD is used to calculate the solar yield between the collector and return sensor
DHWon	2-way valve for switching to cylinder, in combination with DHWoff	eyield	Sensor for more precise solar yield, installed in the solar circuit flow. TD is used to calculate the solar yield between the flow and return

### C.2 Connecting the actuators and sensors to VR 70

Set value	R1	R2	R3/R4	R5/R6	S1	S2	S3	S4	S5	S6	S7
1	3f1	3f2	MA	9k2op/ 9k2cl	DHW1/ BufBt	DEM1	DEM2		SysFlow	FS2	
3	MA	3f2	LP/9e	9k2op/ 9k2cl	BufTop DHW	BufBt DHW	BufBt HC	SysFlow	BufTop HC	FS2	
5	3f1	3f2	9k1op/ 9k1cl	9k2op/ 9k2cl	SysFlow	DEM1	DEM2		FS1	FS2	
6	COLP	3h	MA	9b1	DHW1	DHWBt		SysFlow	COL	Solar Yield	PWM
12	COLP	3f1	9g/9e	9k1op/ 9k1cl	Solar Yield	DHWBt	TD1	TD2	COL	FS1	PWM

### C.3 Connecting the actuators to VR 71

Set value	R1	R2	R3	R4	R5	R6	R7/R8	R9/R10	R11/R12
2	3f1	3f2	3f3	MA	COLP1	LP/9e	9k1op/ 9k1cl	9k2op/ 9k2cl	9k3op/ 9k3cl
3	3f1	3f2	3f3	MA		LP/9e	9k1op/ 9k1cl	9k2op/ 9k2cl	9k3op/ 9k3cl
6	3f1	3f2	3f3	MA		LP/9e	9k1op/ 9k1cl	9k2op/ 9k2cl	9k3op/ 9k3cl

### C.4 Connecting the sensors to VR 71

Set value	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
2	SysFlow	FS2	FS3	FS4	DHW- Top	DHWBt	COL1	Solar Yield	eyield	TD1	TD2	PWM1
3	SysFlow	FS2	FS3	FS4	BufBt	DEM2	DEM3	DEM4	DHW1			
6	SysFlow	FS2	FS3	FS4	BufTop HC	BufBt HC	BufTop DHW	BufBt DHW	DEM2	DEM3	DEM4	

### C.5 VR 70 sensor assignment

Set value	S1	S2	S3	S4	S5	S6
1	VR 10				VR 10	VR 10
3	VR 10	VR 10	VR 10	VR 10	VR 10	VR 10
5	VR 10				VR 10	VR 10
6	VR 10	VR 10		VR 10	VR 11	VR 10
12	VR 10	VR 10	VR 10	VR 10	VR 11	VR 10

### C.6 VR 71 sensor assignment

Set value	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
2	VR 10	VR 10	VR 10	VR 10	VR 10	VR 10	VR 11	VR 10	VR 10	VR 10	VR 10
3	VR 10	VR 10	VR 10	VR 10	VR 10				VR 10		
6	VR 10	VR 10	VR 10	VR 10	VR 10	VR 10	VR 10	VR 10			

## D Overview of the fault messages and faults

### D.1 Fault messages

In column 1 in the table, a \$ symbol is displayed after the sensor. The \$ symbol is a placeholder for the sensor number. The % symbol after various components is a placeholder for the address of the component. In both cases, on the display, the controller replaces the symbol with the specific sensor or specific address.

Message	Possible cause	Measure
<b>Plug-in error</b>	The controller is installed in the boiler	1. Install the controller in the living room.
<b>Room temp. sensor fault</b>	The room temperature sensor is defective	1. Replace the remote control unit.
<b>No additional module connection</b>	The cable is defective	1. Replace the cable.
	Incorrect plug connection	1. Check the plug connection.
<b>Additional module fault</b>	The cable is defective	1. Replace the cable.
	Incorrect plug connection	1. Check the plug connection.
<b>Ventilation unit fault</b>	Ventilation unit fault	1. See the instructions for <b>recoVAIR.../4</b> and later models.
<b>Ventilation unit connection</b>	The cable is defective	1. Replace the cable.
	Incorrect plug connection	1. Check the plug connection.
<b>Communication fault: VR70 %</b>	The cable is defective	1. Replace the cable.
	Incorrect plug connection	1. Check the plug connection.
<b>Communication fault: VR71</b>	The cable is defective	1. Replace the cable.

Message	Possible cause	Measure
<b>Communication fault: VR71</b>	Incorrect plug connection	1. Check the plug connection.
<b>Communication fault: VR91 %</b>	The cable is defective	1. Replace the cable.
	Incorrect plug connection	1. Check the plug connection.
<b>Communication fault: Heat generator %</b>	The cable is defective	1. Replace the cable.
	Incorrect plug connection	1. Check the plug connection.
<b>Communication fault: Heat pump %</b>	The cable is defective	1. Replace the cable.
	Incorrect plug connection	1. Check the plug connection.
<b>Communication fault: VPM-W</b>	The cable is defective	1. Replace the cable.
	Incorrect plug connection	1. Check the plug connection.
<b>Communication fault: VPM-S</b>	The cable is defective	1. Replace the cable.
	Incorrect plug connection	1. Check the plug connection.
<b>Communication fault: VMS</b>	The cable is defective	1. Replace the cable.
	Incorrect plug connection	1. Check the plug connection.
<b>Sensor fault S \$ VR70 %</b>	Sensor defective	1. Replace the sensor.
<b>Sensor fault S \$ VR71</b>	Sensor defective	1. Replace the sensor.
<b>Fault: Heat generator %</b>	Fault in the heat generator	1. See the instructions for the heat generator displayed.
<b>Fault: Heat pump %</b>	Fault in the heat pump	1. See the instructions for the heat pump displayed.
<b>Fault: Solar pump %</b>	Fault in the solar pump	1. Check the solar pump.
<b>Module not supported</b>	Unsuitable module connected, e.g. <b>VR 61, VR 81</b>	1. Install a module that the controller supports.
<b>Incorrect configuration: VR70</b>	Incorrect set value for the <b>VR 70</b>	1. Set the correct set value for the <b>VR 70</b> .
<b>Incorrect configuration: VR71</b>	Incorrect setting value for the <b>VR 71</b>	1. Set the correct setting value for the <b>VR 71</b> .
<b>System diagram selection incorrect</b>	Incorrectly selected system diagram	1. Set the correct system diagram.
<b>No remote control for heating circuit %</b>	No remote control unit	1. Connect the remote control unit.
<b>No VR70 for this system</b>	No <b>VR 70</b> module	1. Connect the <b>VR 70</b> module.
<b>VR71 not supported for this system</b>	<b>VR 71</b> module connected in the system	1. Remove the <b>VR 71</b> module from the system.
	Incorrectly selected system diagram	1. Set the correct system diagram.
<b>Hot water temperature sensor S1 not connected</b>	Hot water temperature sensor S1 not connected	1. Connect the hot water temperature sensor to the <b>VR 70</b> .
<b>Incorrect configuration: MA2 VWZ-AI</b>	Incorrectly connected <b>VR 70</b> module	1. Connect the <b>VR 70</b> module to the appropriate system diagram.
	Incorrectly connected <b>VR 71</b> module	1. Connect the <b>VR 71</b> module to the appropriate system diagram.
<b>Combination of VR70 and VR71 not permitted</b>	<b>VR 70</b> and <b>VR 71</b> are connected in combination	1. Connect either the <b>VR 70</b> or the <b>VR 71</b> .
<b>Cascades not supported</b>	Incorrectly selected system diagram	1. Set the correct system diagram that contains cascades.
<b>Outside temperature sensor damaged</b>	Outside temperature sensor faulty	1. Replace the outside temperature sensor.
<b>Incorrect configuration: VR70 % MA</b>	Incorrectly selected setting value for the multi-function output	1. In the <b>MA VR70, addr. 1</b> function, set the setting value that is appropriate for the connected component on the <b>VR 70</b> 's multi-function output.
<b>Incorrect configuration: VR71</b>	Incorrectly selected setting value for the multi-function output	1. In the <b>MA VR71</b> function, set the setting value that is appropriate for the connected component on the <b>VR 71</b> 's multi-function output.

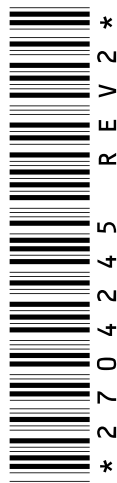
## D.2 Faults

Fault	Possible cause	Measure
Display remains dark	Software error	1. Switch the mains switch on the heat generator that feeds the controller off and back on again.
	No power at the heat generator	1. Check the power supply of the heat generator that feeds the controller.
	The product is defective	1. Replace the product.
No changes in the display when the rotary knob is turned	Software error	1. Switch the mains switch on the heat generator that feeds the controller off and back on again.
	The product is defective	1. Replace the product.
No changes in the display when the selection buttons are pressed	Software error	1. Switch the mains switch on the heat generator that feeds the controller off and back on again.
	The product is defective	1. Replace the product.
Heat generator continues to heat once the room temperature has been reached	Incorrect value in the <b>Room temp. mod.</b> or <b>Zone assignment</b> function	1. Set <b>Thermost.</b> or <b>Temp. mod.</b> in the <b>Room temp. mod.</b> function. 2. In the zone in which the controller is installed, assign the controller's address in <b>Zone assignment</b> .
System remains in hot water handling mode	Heat generator cannot reach the max. target flow temperature	1. Reduce the set value in the <b>Max.DHW fl.targ.temp.</b> function.
Only one of several heating circuits is displayed	Heating circuits inactive	1. Activate the required heating circuit by setting the functionality in the <b>Type of circuit</b> function.
Only one of several zones is displayed	Heating circuits inactive	1. Activate the required heating circuit by setting the functionality in the <b>Type of circuit</b> function.
	Zone deactivated	1. Activate the required zone by setting the value to <b>Yes</b> in the <b>Zone activated</b> function.

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