Operating and Installation Manual

auroMATIC 560

Solar Differential Controller

VRS 560

GB

For the owner

Operating manual

auroMATIC 560

Contents

General information **3**

Special product features **3**

1 Notes on the documentation **3**
1.1 Storage of the documents 3
1.2 Symbols used 3
1.3 CE label 3

2 Safety **3**

3 Information on installation and operation . . **3**
3.1 Vaillant warranty 3
3.2 Intended use 4
3.3 Requirements for the installation site 4
3.4 Care 4
3.5 Recycling and disposal 4

4 Functions **4**
4.1 Solar yield 4
4.2 Reheating 4
4.3 Reheating delay 4
4.4 Connecting a second storage cylinder 4
4.5 Anti-Legionnaire's disease protection 4
4.6 Anti-seize protection for pumps 5
4.7 Circulation 5
4.8 Calendar 5
4.9 Controlling activation duration 5
4.10 Special functions 5
4.10.1 Party function 5
4.10.2 One-time reheating 5
4.10.3 Holiday function 5

5 Operation **5**
5.1 Operating the controller 5
5.2 Overview of the control elements 5
5.3 Display overview 6
5.4 Display modes 6
5.4.1 Main operating level 6
5.4.2 Info level 6
5.4.3 Programming level 7
5.4.4 Special functions 7
5.4.5 Service/diagnostic level 7
5.4.6 Installer level 7
5.5 Settings 8
5.5.1 Calling up values for settings 8
5.5.2 Settings in the main operating level 8
5.5.3 Setting the timer program for reheating 9
5.5.4 Setting the timer program for the circulation pump 9
5.6 Activating the special functions 10

6 Error messages **10**

General information

The solar controller auroMATIC 560 is a temperature-controlled differential controller set for solar hot water preparation with a demand driven reheating function for Vaillant boilers.
The control set is a fully-equipped system for controlling solar systems with a collector array and a storage cylinder.
The controller can also be used in conjunction with various other components such as:
- A swimming pool heating system
- A second storage cylinder

As well as:
- A second collector array
- A circulation pump
- Or a solid-fuel boiler

If a second collector array is connected, an additional collector sensor (available as an accessory) must be installed.
If a second solar cylinder or a swimming pool are added of the system, additional standard sensors (available as accessories) must be installed.
It is possible to determine the solar yield by using an additional yield sensor (available as an accessory).

Special product features

The vrDIALOG 810 diagnostic software enables the simple display and query of specific parameters using a PC, and can be obtained from Vaillant as an accessory. For this purpose, the solar controller is equipped with an eBUS interface.

1 Notes on the documentation

The following information is intended to help you throughout the entire documentation.
Further documents apply in combination with this operating and installation manual.
We accept no liability for any damage caused by failure to observe these instructions.

Other applicable documents
For the owner of the system:
- This operating manual
- Operating manuals for additional system components

For the heating engineer:
- This operating and installation manual
- Operating, assembly, and installation manuals for the additional components

1.1 Storage of the documents
Please store this operating and installation manual and all related documents in a safe place in case they are needed for future reference.
If you move out or sell the appliance, please give the documents to the new owner.

1.2 Symbols used
Please observe the safety instructions in this operating manual for the operation of the appliance.

Danger!
Immediate risk of serious injury or death.

Caution!
Potentially dangerous situations for the product and environment.

Note!
Useful information and instructions.

- Symbol for a required task

1.3 CE label
CE labelling indicates that the auroMATIC 560 solar differential controller complies with the basic requirements of the applicable directives as stated on the data badge.

2 Safety

The controller must be installed by a qualified engineer, who is responsible for adhering to the existing standards and regulations.

Alterations
For alterations to the appliance or to its environment, you must refer to the recognised handicraft business which is responsible for it.

Caution!
Risk of damage due to improper alterations!
Under no circumstances should you ever attempt to make alterations to the control set or other parts of the system.

3 Information on installation and operation

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

3.2 Intended use

The auroMATIC 560 solar controller is a state-of-the-art appliance which has been constructed in accordance with recognised safety regulations. Nevertheless, improper use can cause serious or fatal injury to the user or others, and the appliance or other property can be damaged.
The appliance is a control system for regulating warm water storage with solar heating, and supports reheating with a boiler or with an electric heating rod.
Any other use or extended use is considered to be improper. The manufacturer or supplier is not liable for any resulting damage. The user alone bears any risk.
Intended use includes the observance of the operating manual and all related documents.

Caution!
Any improper use is forbidden.

3.3 Requirements for the installation site

The controller must be installed in a dry room.

3.4 Care

You can clean the housing of the controller with a damp cloth and a little soap.

Note!
Do not use scouring or cleaning agents which could damage the display.

3.5 Recycling and disposal

Neither the controller or any of its accessories belong in the household waste. Make sure the old appliance and any existing accessories are disposed of properly.

4 Functions

4.1 Solar yield

The solar controller works on the principle of differential temperature control. The controller always switches on the collector pump when the difference in temperature (collector temperature - cylinder temperature) is greater than the programmed activation difference.
The controller switches off the collector pump when the difference in temperature (collector temperature - cylinder temperature) is less than the programmed activation difference.
The heating engineer sets the parameters to the installer level when the solar controller is installed.
The solar yield is determined from:

- The difference in temperature between the collector's forward flow and return flow
- The set flow value at the control valve of the flow rate limiter (set during installation)
- The operating time of the collector pump

During installation the heating engineer sets the flow rate limiter and enters the flow rate into the solar controller at the installer level. The solar yield is calculated by the solar controller. The total yield can be called up and reset in the installer level.

4.2 Reheating

The reheating function allows the cylinder to heat up to the required temperature during a set time window, even if the solar energy yield is insufficient. In this case the water can be reheated using an external heater or an electrical heating rod. You can set up time windows for reheating the solar cylinder (see Sec. 5.5.3 for details).

4.3 Reheating delay

To prevent unnecessary reheating by an external heater or an electrical heating rod, the controller is equipped with a reheating delay function. This function delays reheating by up to 30 min. in case the collector pump is running and the solar yield becomes available. If the collector pump remains off and/or the desired cylinder temperature is not reached after the delay period, the cylinder will be reheated using the external heater or electical heating rod.
The reheating delay function is activated in the expert level.

4.4 Connecting a second storage cylinder

You can connect up to two solar cylinders to the controller. The cylinder with the higher maximum temperature will be considered as the priority cylinder. The priority cylinder will always be heated if the collector temperature is greater than than actual temperature plus the set activation difference. The heating of the the cylinder will stop once the maximum temperature for the cylinder is reached, or if the collector temperature is less than the actual cylinder temperature plus the set activation difference.
The second cylinder can only be heated when the first cylinder is not being heated. The same activation and deactivation conditions apply here as well.

4.5 Anti-Legionnaire's disease protection

The anti-Legionnaire's disease protection function is designed to kill germs in the cylinder and pipes.
When the function is activated, the cylinder, the corresponding hot water pipes, and the circulation pump (if installed), are brought to a temperature of 70 °C once a week (Wednesday, 14:00).
In doing so, the cylinder temperature is raised to 70 °C and the corresponding circulation pump is switched on (if installed). First, an attempt will be made using solar yield alone to reach the target temperature over a 90 min. period. If this is not successful, the anti-Legionnaire's disease protection is carried out using an external heater or an electric heating rod, if one or the other has been installed for reheating. The anti-Legionnaire's disease protection function will stop once

a temperature of at least 68 °C has been maintained for a period of 30 minutes.
The heating engineer activates the anti-Legionnaire's disease protection in the installer level and specifies whether the heating process should take place at 3:30 p.m. or at 4:00 a.m. (if the electricity is cheaper then).

4.6 Anti-seize protection for pumps

If no pumping has occurred for 23 hours, all installed pumps are switched on for approx. 3 seconds to prevent pumps from seizing.

4.7 Circulation

If you only have one collector array connected, a circulation pump can be connected to the controller. You can specify up to three heating windows for the circulation pump in the timer program (see Sec. 5.4.4). Set up the time program so that the circulation pump only operates at times when you expect a supply of hot water will be needed. Otherwise the circulation pump operates unnecessarily and inadvertently cools down the cylinder.

4.8 Calendar

The controller is equipped with a calendar so that it can automatically adjust for daylight-savings time. To activate it, simply enter the current date in the installer level.

Note!
In the event of a power failure, the controller only has a power reserve of 30 minutes. After 30 minutes, the internal clock stops and the calender will not automatically resume function once power has been restored. In this case the time and date will need to be reset.

4.9 Controlling activation duration

Activation duration controlling serves to keep the solar circuit at the activation value, and thus in operation, for as long as possible. The pump is switched on and off in periodical bursts depending on the difference between the collector temperature and lower cylinder sensor. When the activation difference is reached, the function is started (if activated) with an activation duration of 50 % - i.e., the pump is switched on for 30 seconds and then switched off for 30 seconds. If the difference in temperature increases, the activation duration is prolonged (e.g., 45 sec. on, 15 sec. off). When the difference in temperature decreases, the activation duration is reduced (e.g., 20 sec. on, 40 sec. off). The period length is always a minute.
Activation duration control is activated in the installer level.

4.10 Special functions

Please refer to Sec. 5.6 for information on how to activate the following special functions.

4.10.1 Party function

When the party function is activated, the reheating function is enabled. This means that the set target value for the cylinder will be maintained by reheating if necessary.

4.10.2 One-time reheating

When this function is activated, the cylinder temperature is reheated to the set level one time.

4.10.3 Holiday function

When this function is activated, the operating mode is switched to "Off" for the set holiday period (1 to 99 days). This deactivates both the solar heating and the reheating function.

5 Operation

5.1 Operating the controller

The controller has a display which consists of symbols, and was designed according to the Vaillant "turn and click" concept. You can call up and set values by turning the dial. You can also click the dial in order to call up values within an operating level. You can access the operating and display levels with the three selection buttons. To prevent operating errors, the programming button must be held down for approx. three seconds to reach the installer level.

5.2 Overview of the control elements

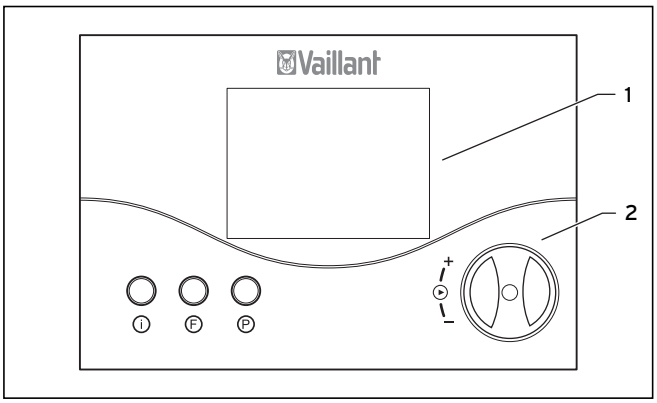

Fig. 5.1 Controls

Key
1 Display
2 Dial (turn and click)
i Info button
F Special functions button
P Programming button

5.3 Display overview

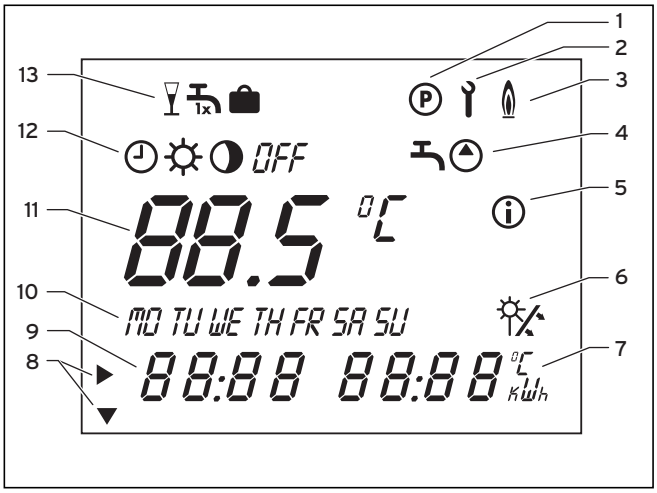

Fig. 5.2 Controls

Key
1 Programming level
2 Service/diagnostic level
3 Reheating
4 Timer programs
5 Info level
6 Solar yield (blinks if solar yield is available)
7 Units
8 Cursor
9 Multifunction display
10 Days of the week
11 Target/actual value
12 Operating modes
13 Special functions

Display symbols

Timer programs:

Timer program for reheating

Timer program for connected circulation pump

Operating modes

Reheating function with timer program

Reheating function in constant standby mode

No reheating

OFF Solar pump(s) not activated
No reheating

Special functions:

Party

One-time reheating

Holiday function

5.4 Display modes

5.4.1 Main operating level

The main operating level appears when the appliance is switched on. Please refer to Sec. 5.5.2 for information on how to set and change the values.

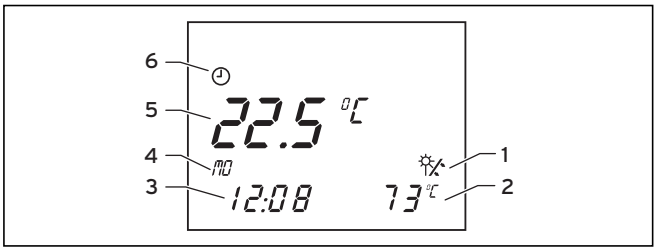

Fig. 5.3 Main operating level

Key
1 Indicates that solar yield is available (collector pump is running)
2 Actual collector temperature
3 Current time, or LEG for anti-Legionnaire's disease function (if active)
4 Current day of the week
5 Actual cylinder temperature (the target temperature can be called up and adjusted by turning the dial)
6 Current operating mode

5.4.2 Info level

You can access the info level by pressing the info button. The display initially appears as seen in the diagram below. You can call up additional information by pressing the info button again (see Sec. 5.5.1). The information called up appears on the display for approx. five seconds, then the display returns to the main operating level.

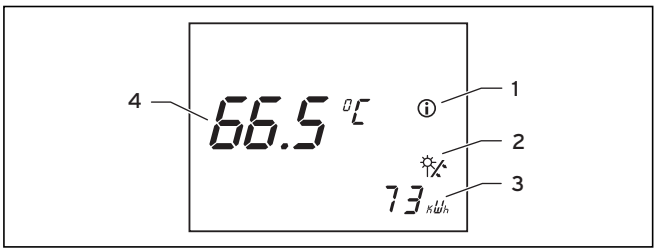

Fig. 5.4 Info level

Key
1 Info level
2 Solar yield indicator (collector pump is running)
3 Solar yield in kWh
4 Target cylinder temperature

5.4.3 Programming level

You can access the level for programming the controller's operating times by pressing the "P" programming button. You can set timer programs here for reheating the solar cylinder and for the connected circulation pump (see Sec. 6.3 and 6.4).
The display returns to the main operating level if you press the programming button.

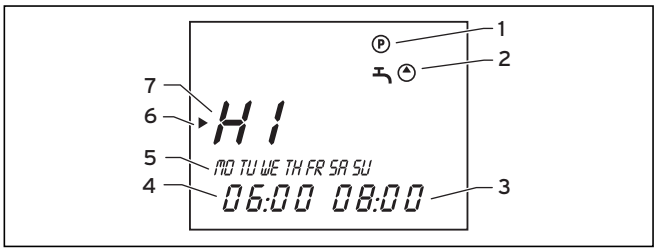

Fig. 5.5 Programming level

Key
1 Programming level
2 Timer program for reheating the solar cylinder (tap symbol) or for the circulation pump (pump symobol)
3 End time
4 Start time
5 Day of the week or block of days
6 Cursor (marks the value to be changed)
7 Time window

5.4.4 Special functions

By pressing the "F" button, you can access the special functions: party, one-time reheating, and holiday function. After approx. ten seconds, the selected function is activated and the display returns to the main operating level.
Please refer to Sec. 5.7 for information on how to activate the individual special functions.

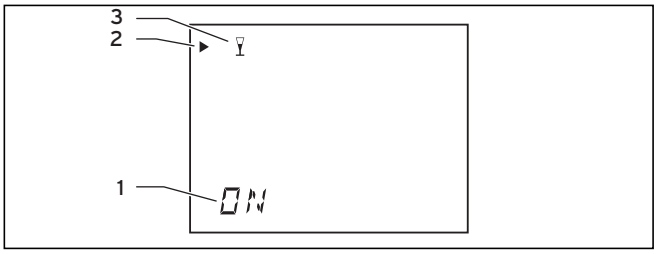

Fig. 5.6 Special functions

Key
1 Special function activated
2 Cursor (marks the special function selected)
3 Symbol for the special function selected

5.4.5 Service/diagnostic level

You can access the service/diagnostic level by simultaneously pressing the programming button "P" and the dial for approx. 3 seconds. All actuators and sensors can be controlled and checked in this level (see Sec. 7 in the installation manual).
The display returns to the main operating level if you press the programming button. The actuators and sensors should be checked by the heating engineer.

5.4.6 Installer level

You can access the installer level by pressing the programming button "P" for approx. 3 seconds.
Press the programming button once to return to the main display level.
These parameters should only be adjusted by the heating engineer.

5.5 Settings

5.5.1 Calling up values for settings

You can call up values for the settings successively by repeatedly pressing the info button.
The information called up appears on the display for approx. five seconds, then the display returns to the main operating level.

Display	Settings
65.5 °C 73 kWh	Cylinder temperature target value yield
SP 1 37 °C	Cylinder sensor 1 temperature
SP 2 37 °C	Cylinder sensor 2 temperature
SP 3 37 °C	Cylinder sensor 3 temperature (if connected)
KOL 1 73 °C	Collector sensor 1 temperature
KOL2 68 °C	Collector sensor 2 temperature (if connected)
K 1P 0	Operating hours for collector pump 1

Table 5.1 Values for settings

Display	Settings
K 2P 0	Operating hours for collector pump 2
H 1 MO 06:00 08:00	Timer program for heating window

Table 5.1 Values for settings (continued)

Any additional timer programs you have set will also be displayed here (see Sec. 5.5.3 and 5.5.4).

5.5.2 Settings in the main operating level

You can adjust the following settings in the main operating level:
- Cylinder temperature target value
- Operating mode
- Current day of the week
- Current time

When you call up a setting, it can be viewed and/or changed for approx. five seconds, then the display automatically returns to the main operating level. Click the dial within the five second period to display the next setting.

Display	Required steps
61.5 °C MO TU WE TH FR SA SU 00:00 73 °C	Turn the dial, after 3 seconds the cursor marks the temperature display, which will be flashing. Turn the dial to adjust the target value for the cylinder temperature.
OFF 61.5 °C MO TU WE TH FR SA SU 88:88 73 °C	Click the dial - The cursor will mark the operating modes. The selected operating mode flashes. Select an operating mode by turning the dial.
61.5 °C MO TU WE TH FR SA SU 00:00 73 °C	Click the dial - The cursor will mark the day of the week. The selected day of the week flashes. Turn the dial to select the current day of the week.
61.5 °C WE 00:00 73 °C	Click the dial - The cursor will mark the hours and/or the minutes. Turn the dial to adjust the current time.

Table 5.2: Settings in the main operating level

5.5.3 Setting the timer program for reheating

You can create a timer program with up to three time windows for reheating the solar cylinder.
The controller is equipped with a default program which can be customised to meet your individual needs.

Time window	Weekday / Block of days	Start time	End time
H 1	M0 - S0	6:00	22:00
H 2	–	–	–
H 3	–	–	–

Table 5.3 Default reheating program

There are four steps to setting the times you want.
1. Select the time window
2. Select a weekday or block of days
3. Set the start time
4. Set the end time

You can specify up to three time windows, as long as none of the time windows overlap another.
For clarification, the individual steps are shown in the following table:

Display	Required steps
H1 MO TU WE TH FR SA SU 00:00 00:00	Press the programming key P Turn the dial until you see the tap symbol.
H1 MO TU WE TH FR SA SU 00:00 00:00	Click the dial - The cursor marks the changeable value (H1), which also flashes. Select the time window by turning the dial. Settings: H 1, H 2, H 3
H1 MO TU WE TH FR SA SU 00:00 00:00	Click the dial - The cursor marks the block of days display, which also flashes. Select a block of days or a single day of the week by turning the dial. Settings: (MO-SU); (MO - FR); (SA-SU); (MO); (TU); (WE); (TH); (FR); (SA); (SU)
H1 MO TU WE TH FR SA SU 00:00 00:00	Click the dial – The cursor marks the start time and the hour display flashes. Select the start time by turning the dial. Click the dial to set the minutes.
H1 MO TU WE TH FR SA SU 00:00 00:00	Click the dial – The cursor marks the end time and the hour display flashes. Select the end time by turning the dial. Click the dial again to set the minutes.

Table 5.4 Setting time windows

5.5.4 Setting the timer program for the circulation pump

You can create a customised timer program for a connected circulation pump (only possible for hydraulic plan 1), just as you can for the reheating function.
The controller is equipped with a default program for this as well:

Time window	Weekday / Block of days	Start time	End time
H 1	M0 - S0	6:00	22:00
H 2	–	–	–
H 3	–	–	–

Table 5.5 Default circulation pump program

You can access the timer program for the circulation pump by pressing the programming button and turning the dial until the pump symbol appears in the display.
The setting of the desired heating times is done in the same manner as the setting of the heating times for the reheating function (see Sec. 5.5.3). Set up the timer program so that the circulation pump only operates at times when you expect a supply of hot water will be needed. Otherwise the circulation pump operates unnecessarily and inadvertently cools down the cylinder.

5.6 Activating the special functions

Display	Required steps
ON	**Party function** Press the special function button once- the party symbol flashes for approx. ten seconds in the display, then the function is activated. The function is deactivated automatically when the next reheating window begins. If you want to deactivate the function before, simply reselect the function. The function can only be activated in the reheating operation mode.
ON	**One-time reheating** Press the special function button twice - The one-time reheating symbol flashes in the display for approx. ten seconds, then the function is activated. If you want to deactivate the function before, simply reselect the function.
28 ON	**Holiday function** Press the special function buttonthree times - the holiday function symbol flashes in the display for approx. ten seconds, and you can use the dial to set the number of holidays. Finally, the function is activated for the set time. If you want to deactivate the function before, simply reselect the function. If the anti-Legionnaire's disease function is activated, the protection will be carried out on the last holiday.

Table 5.6 Activating the special functions

6 Error messages

The auroMATIC 560 solar controller shows error messages in the main operating level if there is a problem with the temperature sensor.
The sensor configuration will always be displayed when the controller is switched on for the first time, or if the power has been switched off and on again. Depending on the set hydraulic plan, the controller recognises whether there is a problem, or if the sensor is not necessary for operation.

Caution!
Never try to repair or carry out maintenance work on the controller yourself. Call in an approved technician. We recommend concluding a maintenance contract for your solar system with a recognised handicraft business.

The following table explains the error messages.

Display	Message/Description
OFF 61.5 °C MO TU WE TH FR SA SU KOL 1 Err	Error collector sensor 1 This error occurs if the there is a problem with the sensor, or if it is not connected.
OFF 61.5 °C MO TU WE TH FR SA SU KOL2 Err	Error collector sensor 2 This error occurs if a sensor is connected for hydraulic plan 1, or for hydraulic plan 2 or 3 if there is a problem with the connected sensor or it is not connected.
OFF 61.5 °C MO TU WE TH FR SA SU SP 1 Err	Error cylinder sensor 1 This error occurs if the there is a problem with the connected sensor.
OFF 61.5 °C MO TU WE TH FR SA SU SP2 Err	Error cylinder sensor 2 This error occurs if the there is a problem with the sensor, or if it is not connected.
OFF 61.5 °C MO TU WE TH FR SA SU SP3 Err	Error cylinder sensor 3 This error occurs if the there is a problem with the connected sensor.

Table 6.1: Error messages

For the heating engineer

Installation manual

auroMATIC 560

Contents

1 Notes on the documentation 2
1.1 Storage of the documents 2
1.2 Symbols used 2

2 Description of the appliance. 2
2.1 CE label 2
2.2 Intended use 2

3 Safety instructions and regulations 2
3.1 Safety instructions. 2
3.2 Regulations 2

4 Installation. 3
4.1 Scope of delivery 3
4.2 Installing VR 10 standard sensor. 3
4.3 Accessories 3
4.3.1 VR 10 standard sensor 3
4.3.2 VR 11 collector sensor 3
4.4 Installing the controller housing 3

5 Electrical installation 4
5.1 Wiring according to hydraulic plan 5
5.2 Hydraulic plan 1 6
5.3 Hydraulic plan 2 10
5.4 Hydraulic plan 3 14
5.5 Special plan: Heater with “hot water capable” heating controller 18

6 Start-up 20
6.1 Setting the system parameters 20
6.2 Resetting system parameters to the default settings 22

7 Service/diagnostic level 22

8 Emergency mode. 23

9 Vaillant customer service. 23

10 Technical data 24

11 Sensor characteristics 24

1 Notes on the documentation

The following information is intended to help you throughout the entire documentation.
Further documents apply in combination with this operating and installation manual.
We accept no liability for any damage caused by non-observance of these instructions.

Caution!
This document is not a guide for making hydraulic connections. The appropriate documents should be referred to for this.

Other applicable documents
For the heating engineer:
- This operating and installation manual
- Operating, assembly, and installation manuals for the additional components

1.1 Storage of the documents

Please give this operating and installation manual and all other valid documents and auxiliary equipment to the owner of the system. The owner shall ensure that the manuals and auxiliary equipment are properly stored, so that they are available whenever required.

1.2 Symbols used

Please observe the safety instructions in this installation manual when installing the appliance.

Danger!
Immediate risk of serious injury or death.

Danger due to high voltage!
Immediate risk of serious injury or death!

Caution!
Potentially dangerous situations for the product and environment!

Note!
Useful information and instructions.

- Symbol for a required task.

2 Description of the appliance

2.1 CE label

The CE label indicates that the controller meets the basic requirements of the Council of Europe's directive 89/336/EEC for electromagnetic compatibility.

2.2 Intended use

The auroMATIC 560 controller is a state-of-the-art appliance which has been constructed in accordance with recognised safety regulations. Nevertheless, improper use can cause serious or fatal injury to the user or others, and the appliance or other property can be damaged.
The appliance is a control system for regulating warm water storage with solar heating, and supports reheating with a boiler or with an electric heating rod.
Any other use or extended use is considered to be improper. The manufacturer or supplier is not liable for any resulting damage. The user alone bears any risk.
Intended use includes the observance of the operating and installation manuals, and all related documents.

Caution!
Any improper use is forbidden.

3 Safety instructions and regulations

3.1 Safety instructions

The controller must be installed by a qualified engineer, who is responsible for adhering to the existing standards and regulations. We accept no liability for any damage caused by failure to observe these instructions.

Danger!
Risk of fatal electric shock from touching live connections.
Before working on the appliance, switch off the power supply and secure it against restart.

3.2 Regulations

All wiring must be in accordance with Building Regulations Part P, current IEE regulations, and must be carried out by a competent person.
Use standard wires for wiring.
Minimum cross-section of wires:
- Power supply 230 V (pump connection cable): 1.5 mm^2
- Extra-low voltage lines (sensor wires): 0.75 mm^2

Sensor wires may not be more than 50 m long.

Connections with 230 V and sensor wires must be laid separately if longer than 10 m.

230 V connection leads must be supplied in 1.5 mm^2 and fastened to base using the accompanying cable clamps.

Do not use free terminals on the appliances as support terminals for other wiring.

The controller must be installed in a dry room.

4 Installation

4.1 Scope of delivery

Using Table 4.1, verify the scope of delivery for the controller set.

Item	Quantity	Components
1	1	auroMATIC 560 controller
2	1	VR 11 collector sensor
3	2	VR 10 standard sensor
4	1	C1/C2 cable

Table 4.1 Scope of delivery

4.2 Installing VR 10 standard sensor

The VR 10 standard sensor is designed so that it can be used as an immersion sensor or flow sensor.
When used as a flow sensor, the sensor is secured to the forward flow pipe or the return pipe using the supplied tension band. In order to guarantee good heat transfer, the sensor is flat on one side. We also recommend that the pipe with the sensor is insulated, in order to enable the best possible measuring of temperature.

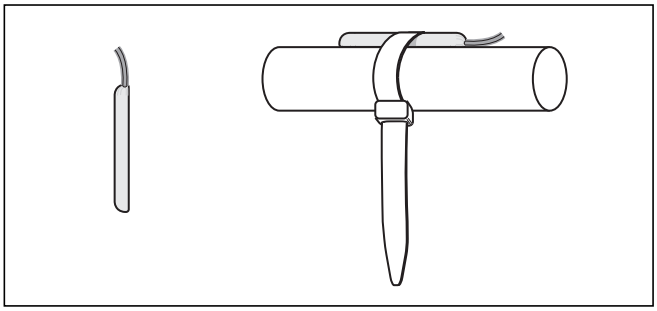

Fig. 4.1 VR 10 standard sensor

4.3 Accessories

The following accessories are necessary in order to connect a second collector array or an additional solar cylinder to the controller, and to enable measurement of the solar yield.

4.3.1 VR 10 standard sensor

The use of additional standard sensors is necessary if you want to connect a second solar cylinder to the controller.
An additional standard sensor is also required in order to enable the measuring of yield.

4.3.2 VR 11 collector sensor

If a second collector array is connected, it is necessary to install a second collector sensor from the Vaillant accessory range.

4.4 Installing the controller housing

The controller is designed to be mounted on a wall, and it is equipped with System ProE terminal strips. These terminals must be used for all connections made at the installation site.

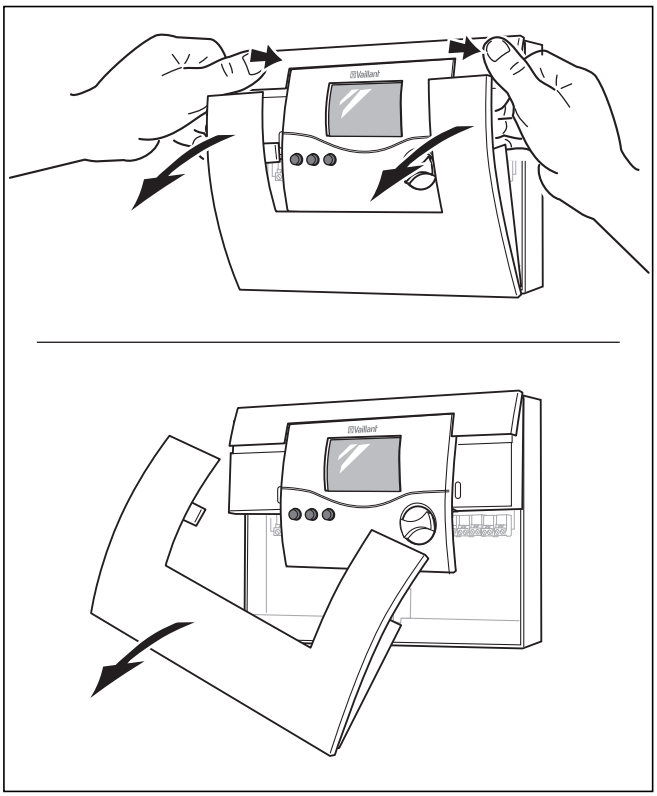

Fig. 4.2 Opening the controller housing

The cover consists of two parts, which can be removed separately.

- As shown in Fig. 4.2, pull the lower front cover off of the controller housing.

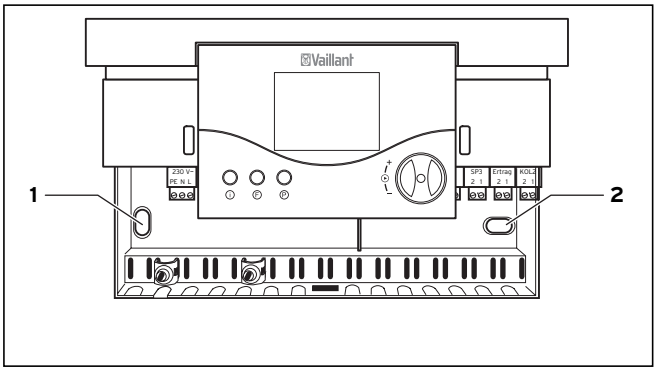

Fig. 4.3 Fastening the controller housing

- Mark the position of both holes (**1** und **2**) and drill the bore holes.
- Select the wall plugs to suit the state of the wall, and screw the controller housing on tightly.

ProE-system wiring

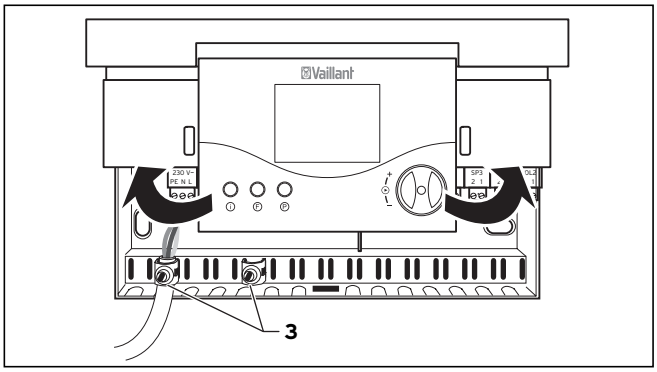

Fig. 4.4 Fold-up the control panel

- Fold the control panel towards the top.
- Wire the controller according to the selected hydraulic plan (see Section 5.1).
- Secure all cables with the accompanying cable clamps (**3**).
- Fold the control panel back down.
- Attach the front cover again.

5 Electrical installation

The electrical connection may only be carried out by an approved specialist company.

Danger!
Risk of fatal electric shock from touching live connections. Before working on the appliance, turn off the power supply and secure against restart.

Caution!
The circuit board can be damaged if short circuited through the connection leads. For safety purposes, a max. of 30 mm of insulation may be removed from the ends of 230 V leads which will be connected to ProE plugs. If more insulation is removed, there is a risk of short circuiting the circuit board.

Caution!
When exchanging the controller in an existing system, sensor-curve characteristics should be taken into consideration (see Sec. 11), and the sensors should be replaced if necessary!

Caution!
An optional electric heating rod (EP) must be installed with an additional relay or contactor with a circuit-breaking capacity of at least 16 A. Never operate an electric heating rod in connection with the auroMATIC 560 without an additional external relay or contactor.

Caution!
The C1/C2 contact is a 24 V low-voltage contact and should never be used as a 230 V switching contact.

5.1 Wiring according to hydraulic plan

To simplify installation, three hydraulic plans are stored in the controller. The relevant plan must be selected according to the system configuration used.
Each of the hydraulic plans show a possible system configuration in which some system components are optional.

Caution!
These hydraulic plans are only schematic representations and cannot be used for the preparation of the hydraulic piping.

Hydraulic plan	Bivalent cylinder	Number of collectors	Circulation pump connected	Solid-fuel boiler connected	2nd Cylinder or swimming pool connected
1	X	1	yes	no	yes
2	X	2	no	no	yes
3	X	1	no	yes	yes

Table 5.1 System configuration

5.2 Hydraulic plan 1

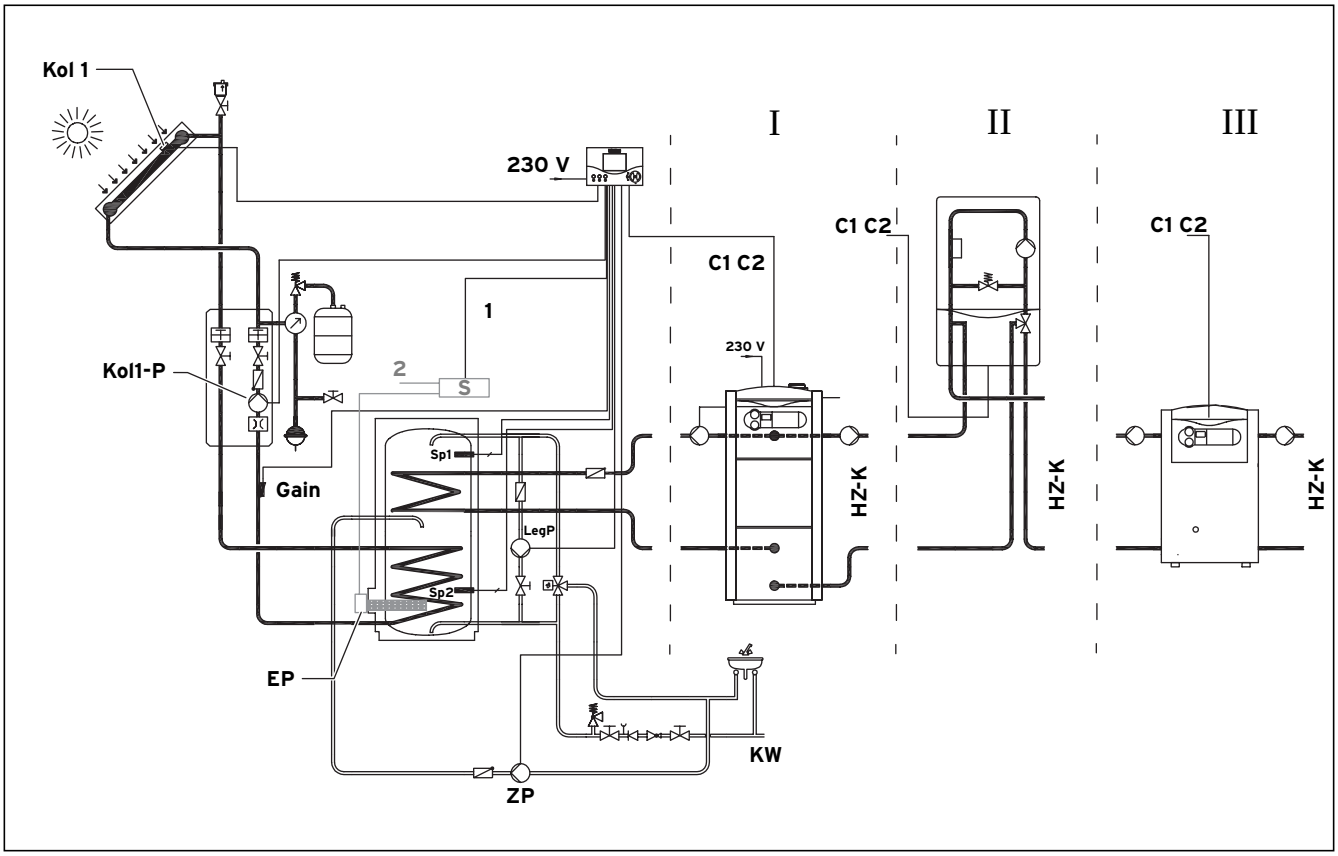

Fig. 5.1 Hydraulic plan 1 with system configuration: one collector array, one solar cylinder, connection option for various heaters for reheating the cylinder

Designation in hydraulic plan/ wiring diagram	Components
I, II, III	Connection option for various heaters for reheating the cylinder
C1/C2	Connections for controlling the heater used for reheating the cylinder
HZ-K	Heating circuit(s)
KW	Cold water
ZK	Circulation pump
EP	Electric heating rod (optional)
Kol1-P	Solar circuit pump 1
Kol 1	Collector sensor 1
Ertrag	Gain
LegP	Legionaire's protection pump
Sp1	Cylinder sensor 1
Sp2	Cylinder sensor 2
S	Contactor

Designation in hydraulic plan/ wiring diagram	Components
1	Option: Control contactor for optional electric heating rod
2	400 V connection, 3 phase
230 V	230 V main power connection
F1 (T4)	Fuse holder
VU / VK	Heater wiring area

Table 5.2 Key for Fig. 5.1 and Fig. 5.2

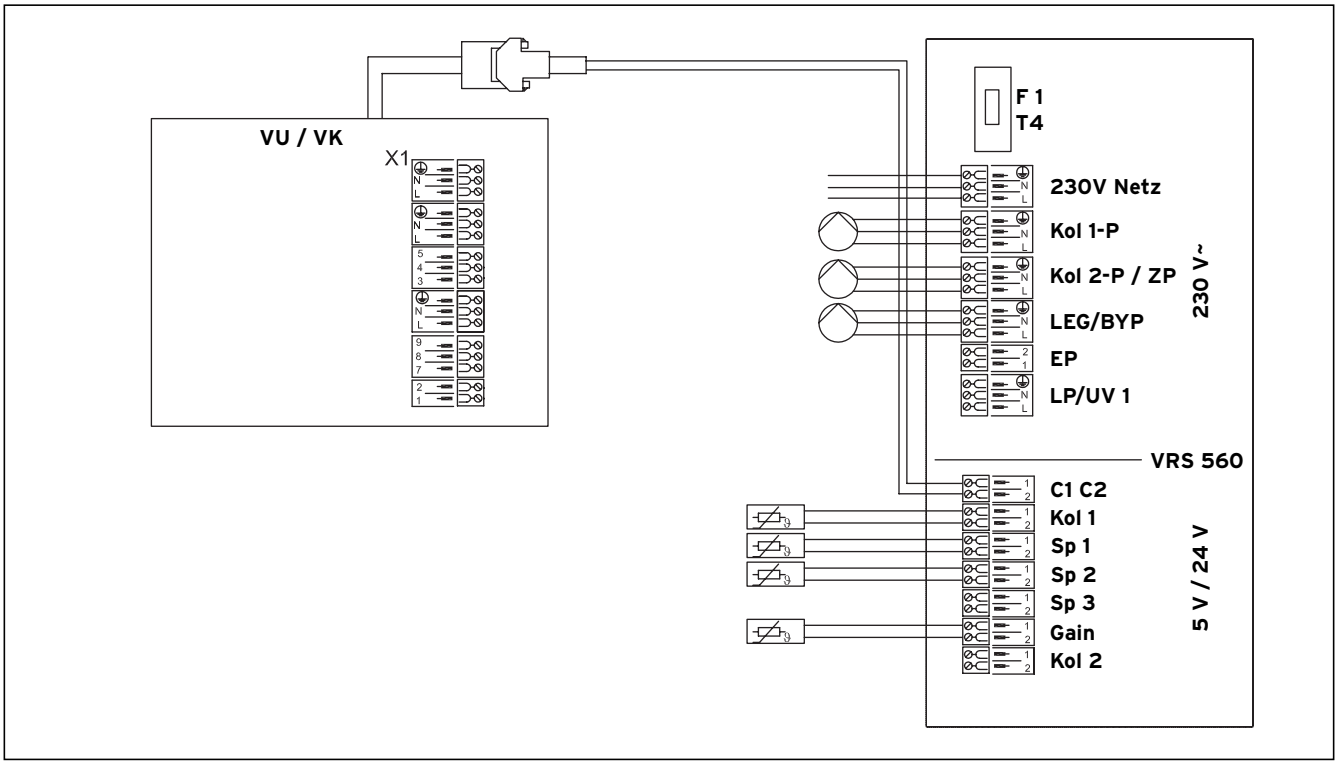

Fig. 5.2 Wiring diagram for hydraulic plan 1

Hydraulic plan 1: Connection of a second cylinder or swimming pool

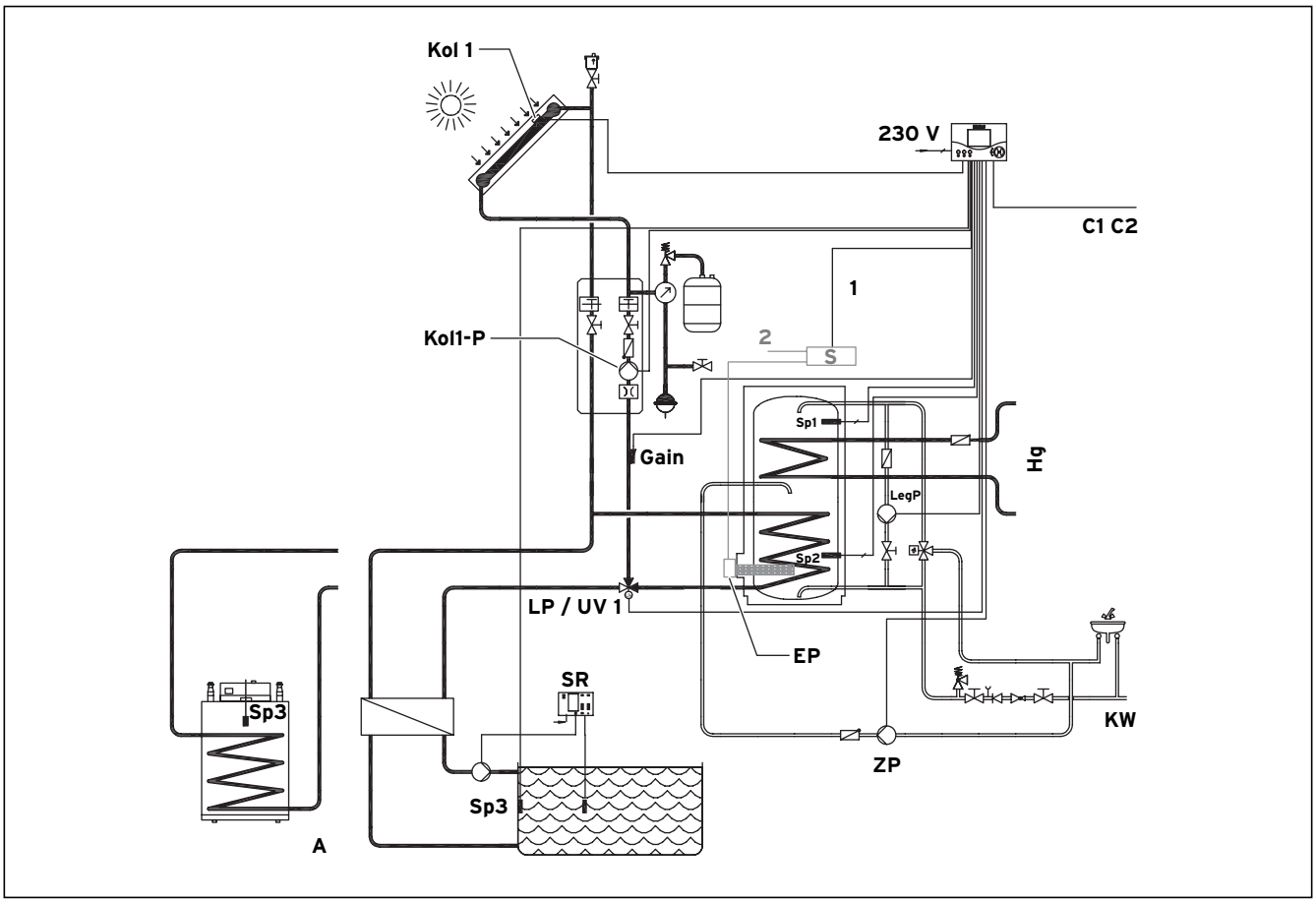

Fig. 5.3 Hydraulic plan 1: Connection of a second cylinder or swimming pool

Designation in hydraulic plan/ wiring diagram	Components
C1/C2	Connections for controlling the heater used for reheating the cylinder
Hg	Boiler
KW	Cold water
ZP	Circulation pump
EP	Electric heating rod (optional)
SR	Swimming pool controller (provided by customer)
LP / UV 1	Switching valve UV 1 in current-free state
A	Alternative connection for second cylinder
Kol1-P	Solar circuit pump 1
Kol 1	Collector sensor 1
Ertrag	Gain
LegP	Anti-Legionnaire's pump
Sp1	Cylinder sensor 1

Designation in hydraulic plan/ wiring diagram	Components
Sp2	Cylinder sensor 2
Sp3	Cylinder sensor 3
S	Contactor
1	Option: Control contactor for optional electric heating rod
2	400 V connection, 3 phase
230 V	230 V main power connection
F1 (T4)	Fuse holder
VU / VK	Heater wiring area

Table 5.3 Key for Fig. 5.3 and Fig. 5.4

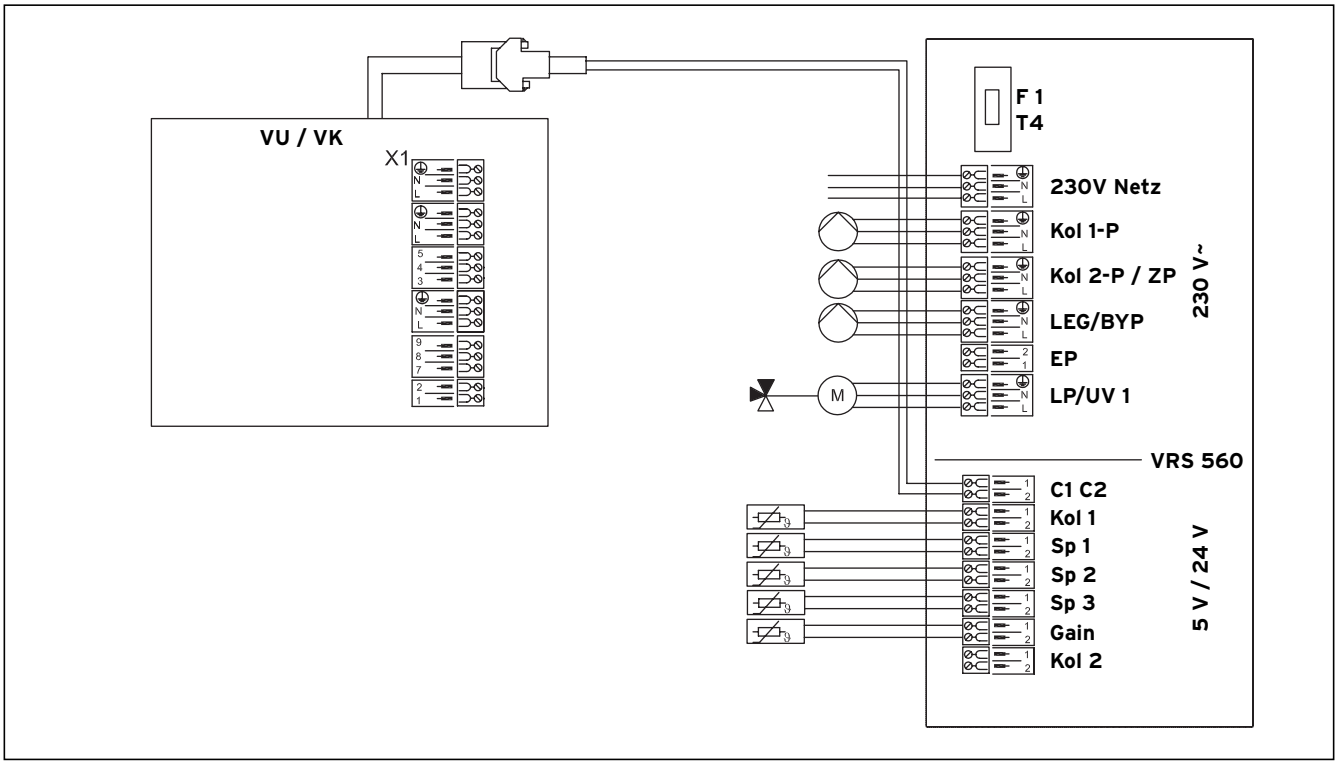

Fig. 5.4 Wiring diagram for hydraulic plan 1: Connection of a second cylinder or swimming pool

5.3 Hydraulic plan 2

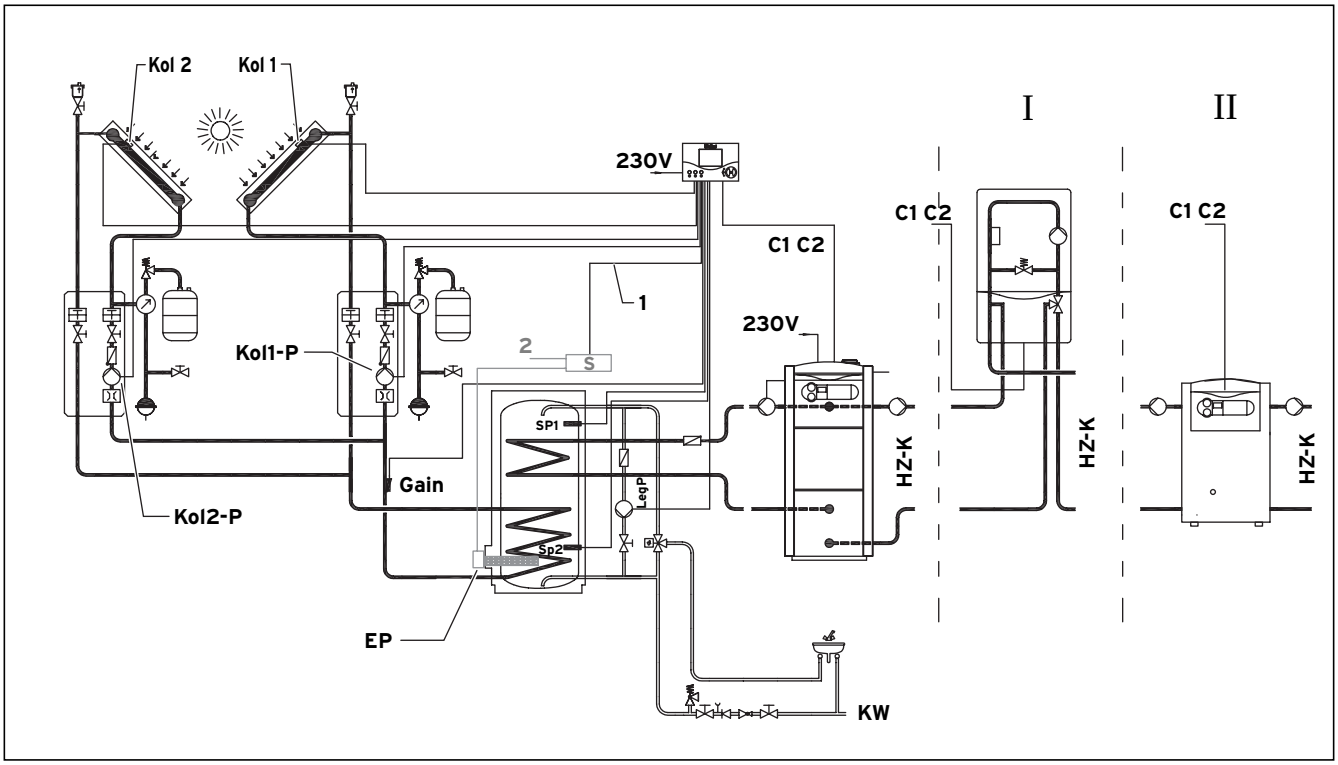

Fig. 5.5 Hydraulic plan 2 with system configuration: Two collector arrays, one solar cylinder, connection option for various heaters for reheating the cylinder

Designation in hydraulic plan/ wiring diagram	Components
I, II	Connection option for various heaters for reheating the cylinder
C1/C2	Connections for controlling the heater used for reheating the cylinder
HZ-K	Heating circuit(s)
KW	Cold water
EP	Electric heating rod (optional)
Kol1-P	Solar circuit pump 1
Kol2-P	Solar circuit pump 2
Kol 1	Collector sensor 1
Kol 2	Collector sensor 2
Ertrag	Gain
LegP	Anti-Legionnaire's pump
Sp1	Cylinder sensor 1
Sp2	Cylinder sensor 2
S	Contactor

Designation in hydraulic plan/ wiring diagram	Components
1	Option: Control contactor for optional electric heating rod
2	400 V connection, 3 phase
230 V	230 V main power connection
F1 (T4)	Fuse holder
VU / VK	Heater wiring area

Table 5.4 Key for Fig. 5.5 and Fig. 5.6

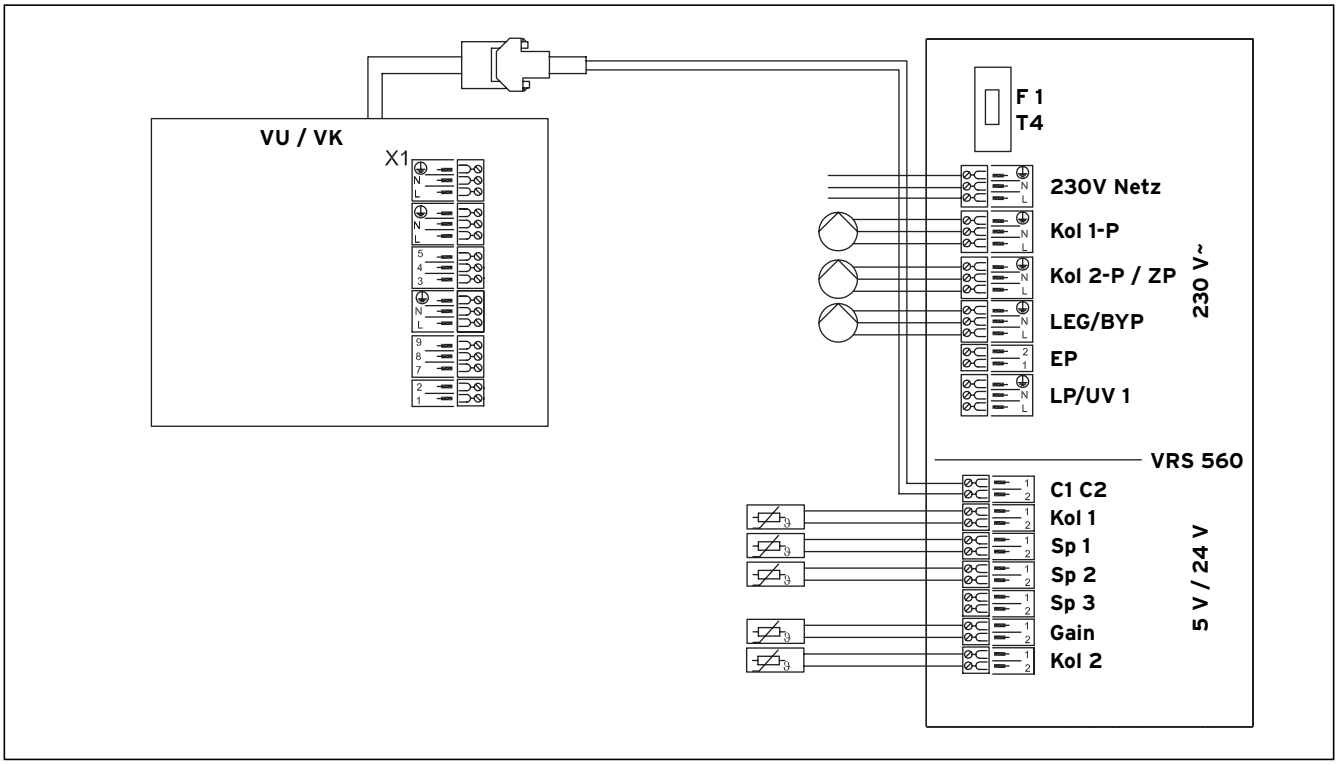

Fig. 5.6 Wiring diagram for hydraulic plan 2

Hydraulic plan 2: Connection of a second cylinder or swimming pool

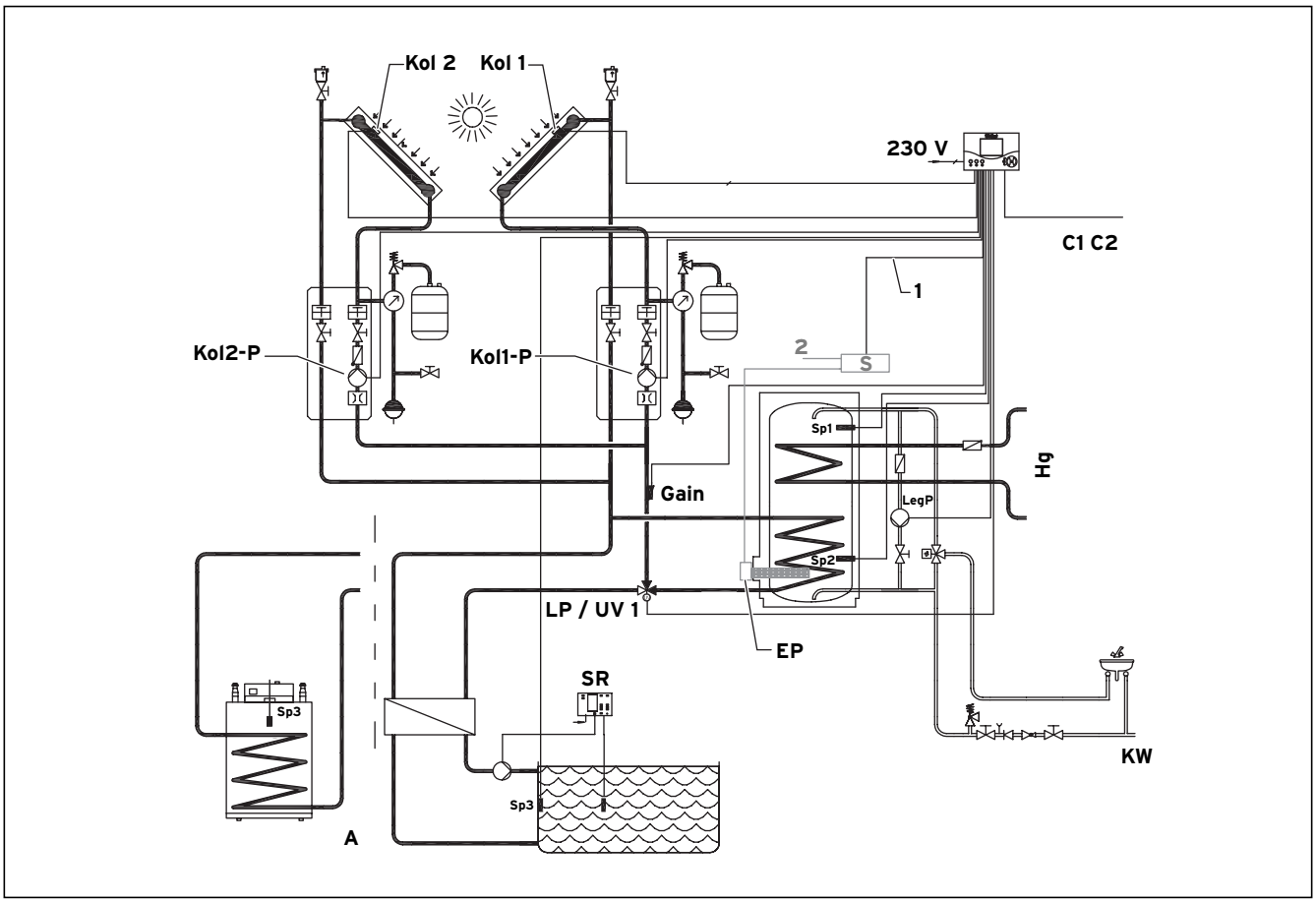

Fig. 5.7 Hydraulic plan 2: Connection of a second cylinder or swimming pool

Designation in hydraulic plan/ wiring diagram	Components
C1/C2	Connections for controlling the heater used for reheating the cylinder
Hg	Boiler
KW	Cold water
EP	Electric heating rod (optional)
SR	Swimming pool controller (provided by customer)
LP / UV 1	Switching valve UV 1 in current-free state
A	Alternative connection for second cylinder
Kol1-P	Solar circuit pump 1
Kol2-P	Solar circuit pump 2
Kol 1	Collector sensor 1
Kol 2	Collector sensor 2
Ertrag	Gain
LegP	Anti-Legionnaire's pump
Sp1	Cylinder sensor 1

Designation in hydraulic plan/ wiring diagram	Components
Sp2	Cylinder sensor 2
Sp3	Cylinder sensor 3
S	Contactor
1	Alternative contactor or KI 3-4 (old or foreign boilers)
2	400 V connection, 3 phase
230 V	230 V main power connection
F1 (T4)	Fuse holder
VU / VK	Heater wiring area

Table 5.5 Key for Fig. 5.7 and Fig. 5.8

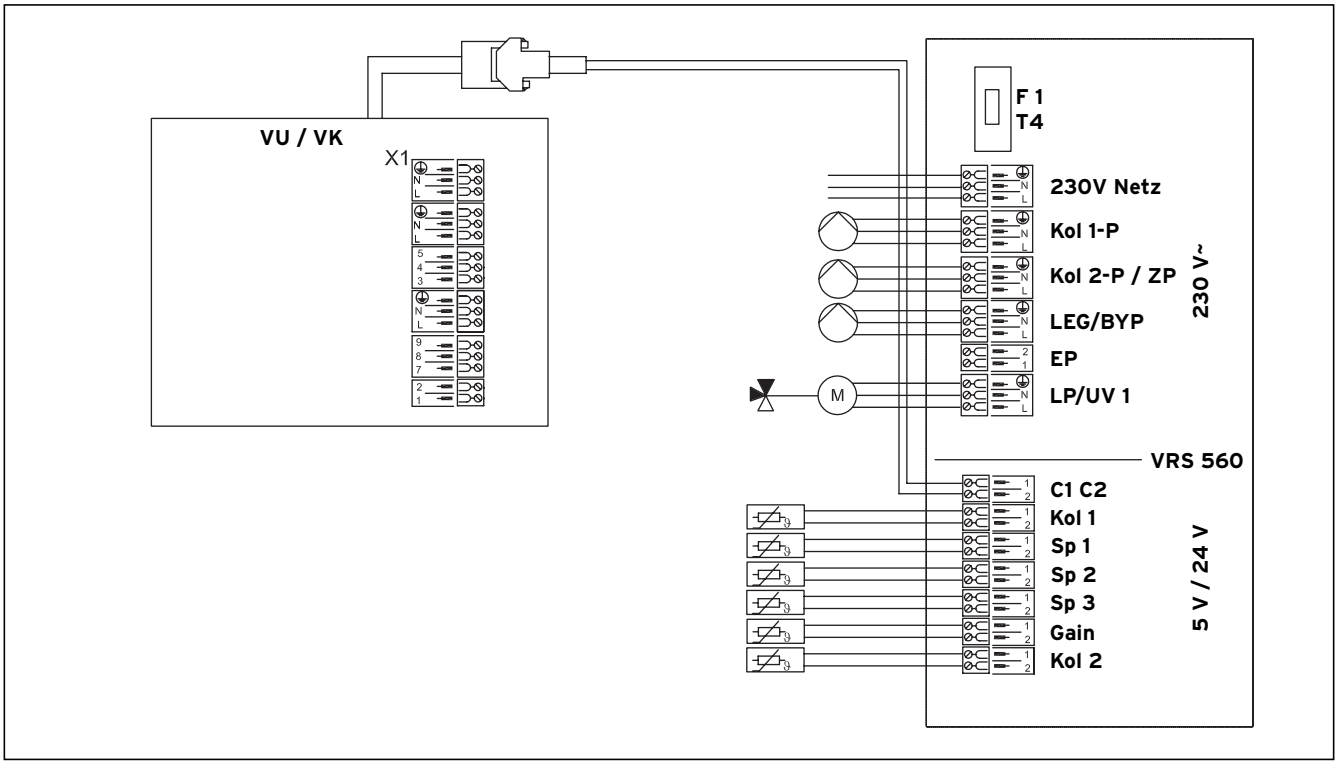

Fig. 5.8 Wiring diagram for hydraulic plan 2: Connection of a second cylinder or swimming pool

5.4 Hydraulic plan 3

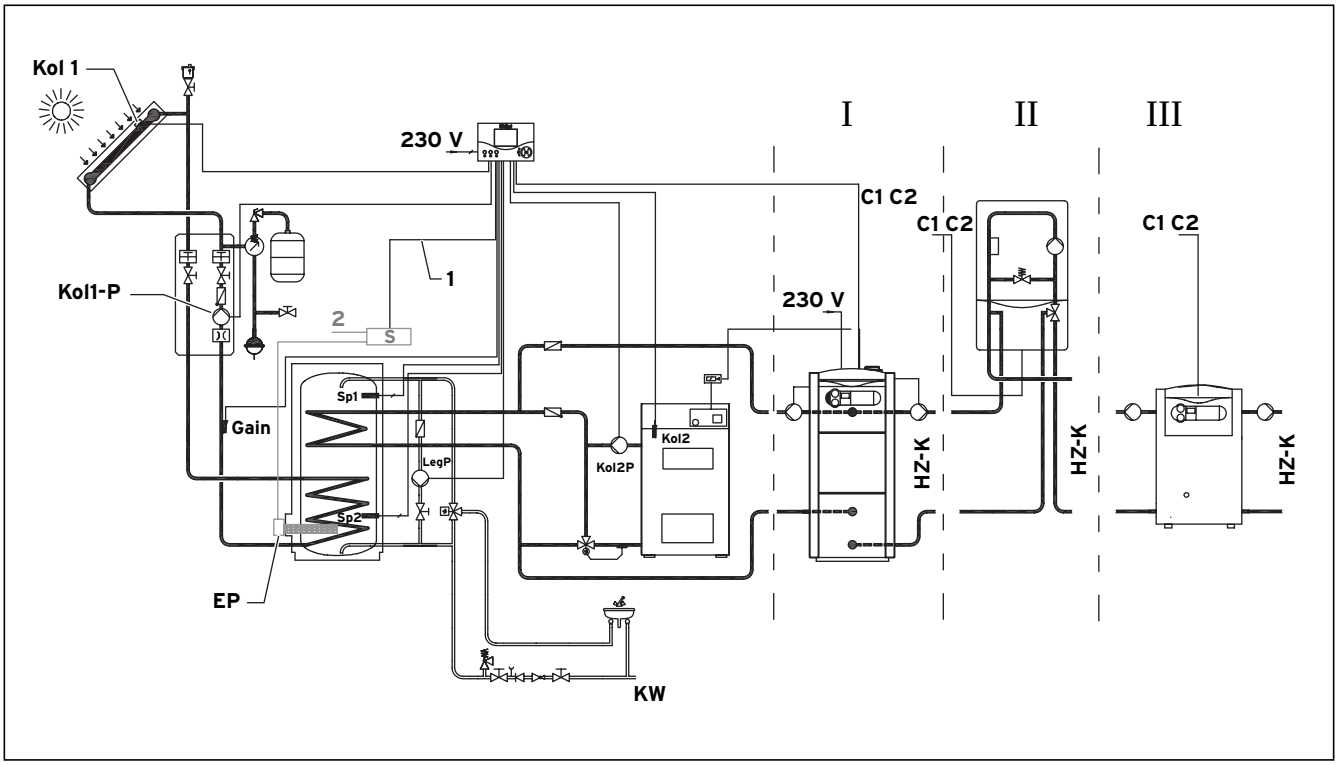

Fig. 5.9 Hydraulic plan 3 with system configuration: One collector array, one solid-fuel boiler, one solar cylinder, connection option for various heaters for reheating the cylinder

Designation in hydraulic plan/ wiring diagram	Components
I, II, III	Connection option for various heaters for reheating the cylinder
C1/C2	Connections for controlling the heater used for reheating the cylinder
HZ-K	Heating circuit(s)
KW	Cold water
EP	Electric heating rod (optional)
Kol1-P	Solar circuit pump 1
Kol 1	Collector sensor 1
Kol2-P	Reheating pump 2
Kol 2	Reheating sensor 2
Ertrag	Gain
LegP	Anti-Legionnaire's pump
Sp1	Cylinder sensor 1
Sp2	Cylinder sensor 2
S	Contactor
1	Option: Control contactor for optional electric heating rod
2	400 V connection, 3 phase

Designation in hydraulic plan/ wiring diagram	Components
230 V	230 V main power connection
F1 (T4)	Fuse holder
VU / VK	Heater wiring area

Table 5.6 Key for Fig. 5.9 and Fig. 5.10

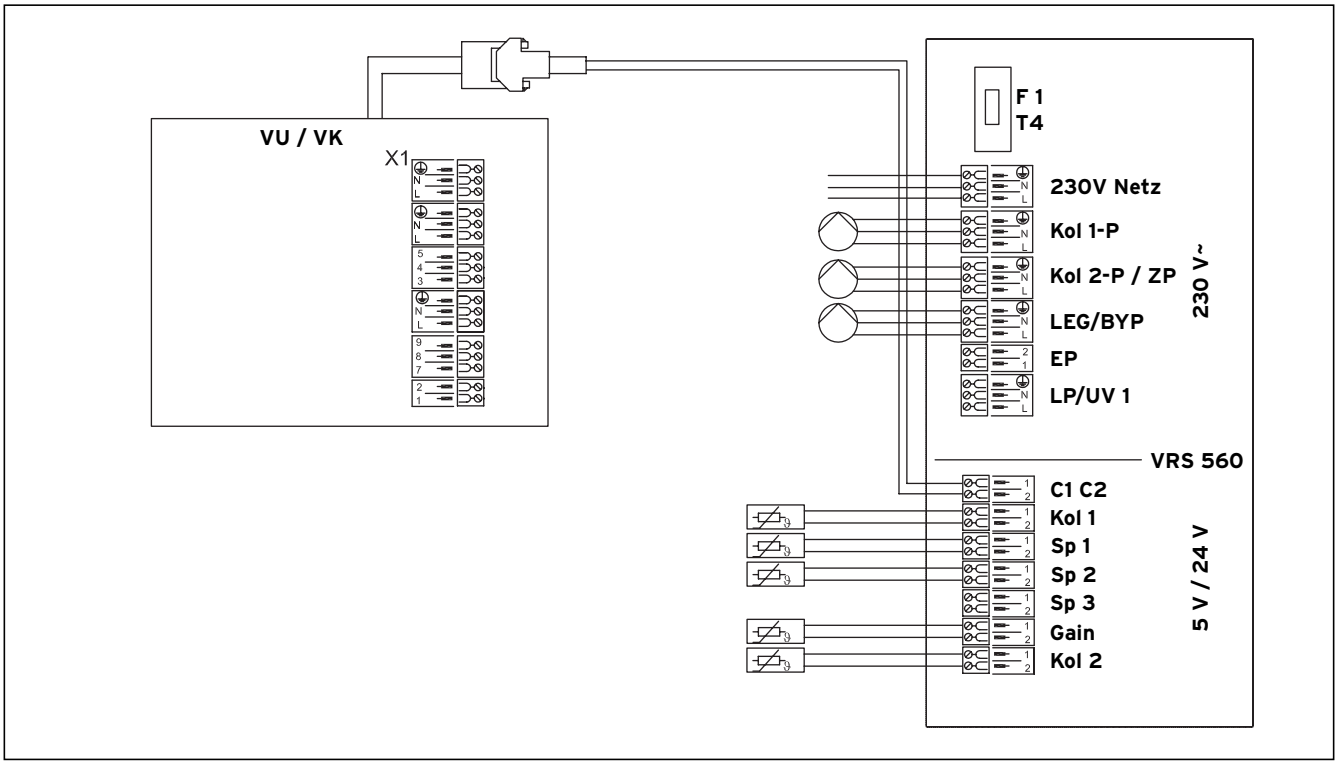

Fig. 5.10 Wiring diagram for hydraulic plan 3

Hydraulic plan 3: Connection of a second cylinder or swimming pool

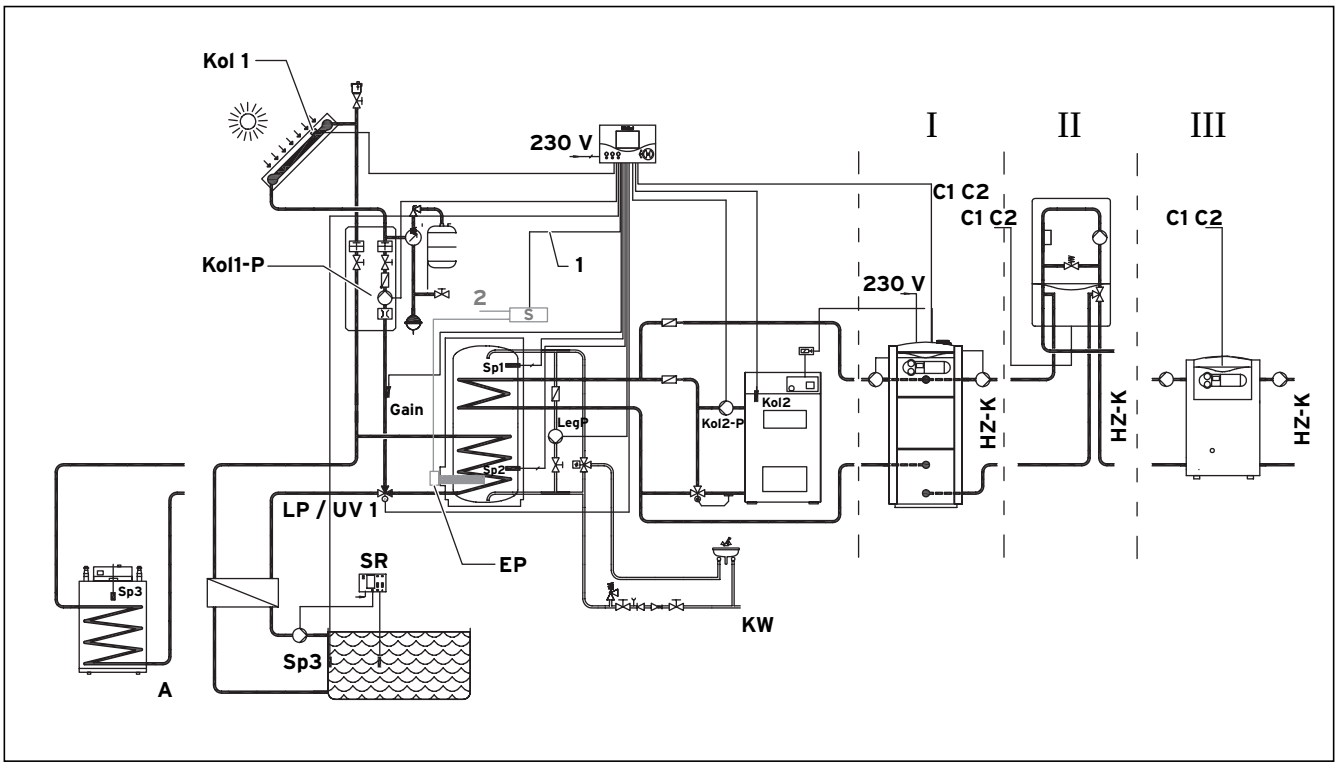

Fig. 5.11 Hydraulic plan 3: Connection of a second cylinder or swimming pool

Designation in hydraulic plan/ wiring diagram	Components
I, II, III	Connection option for various heaters for reheating the cylinder
C1/C2	Connections for controlling the heater used for reheating the cylinder
HZ-K	Heating circuit
KW	Cold water
EP	Electric heating rod (optional)
SR	Swimming pool controller (provided by customer)
LP / UV 1	Switching valve
	UV 1 in current-free state
A	Alternative
Kol1-P	Solar circuit pump 1
Kol 1	Collector sensor 1
Kol2-P	Reheating pump 2
Kol 1	Collector sensor 1
Kol 2	Reheating sensor 2
Ertrag	Gain
LegP	Anti-Legionnaire's pump
Sp1	Cylinder sensor 1

Designation in hydraulic plan/ wiring diagram	Components
Sp2	Cylinder sensor 2
Sp3	Cylinder sensor 3
S	Contactor
230 V	230 V main power connection
1	Option: Control contactor for optional electric heating rod
2	400 V connection, 3 phase
230 V	230 V main power connection
F1 (T4)	Fuse holder
VU / VK	Heater wiring area

Table 5.7 Key for Fig. 5.11 and Fig. 5.12

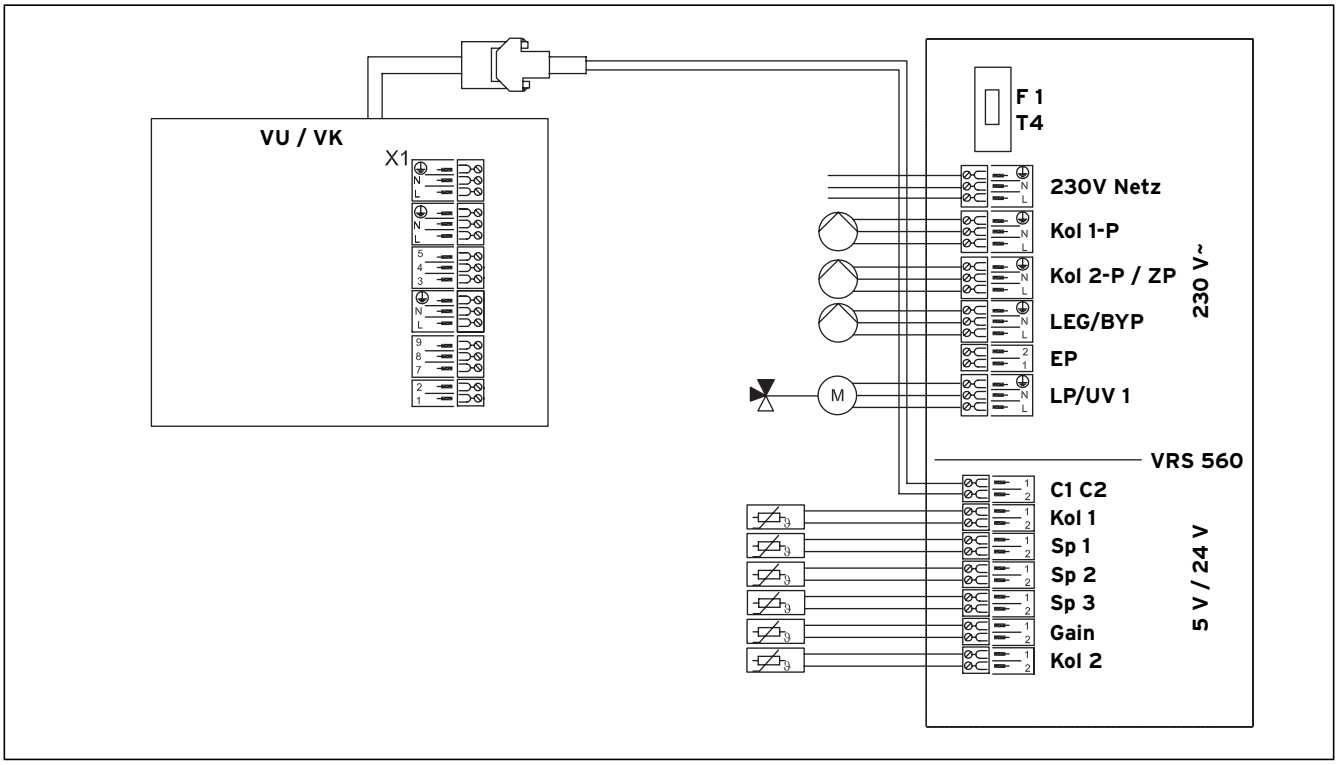

Fig. 5.12 Wiring diagram for hydraulic plan 3: Connection of a second cylinder or swimming pool

5.5 Special plan: Heater with "hot water capable" heating controller

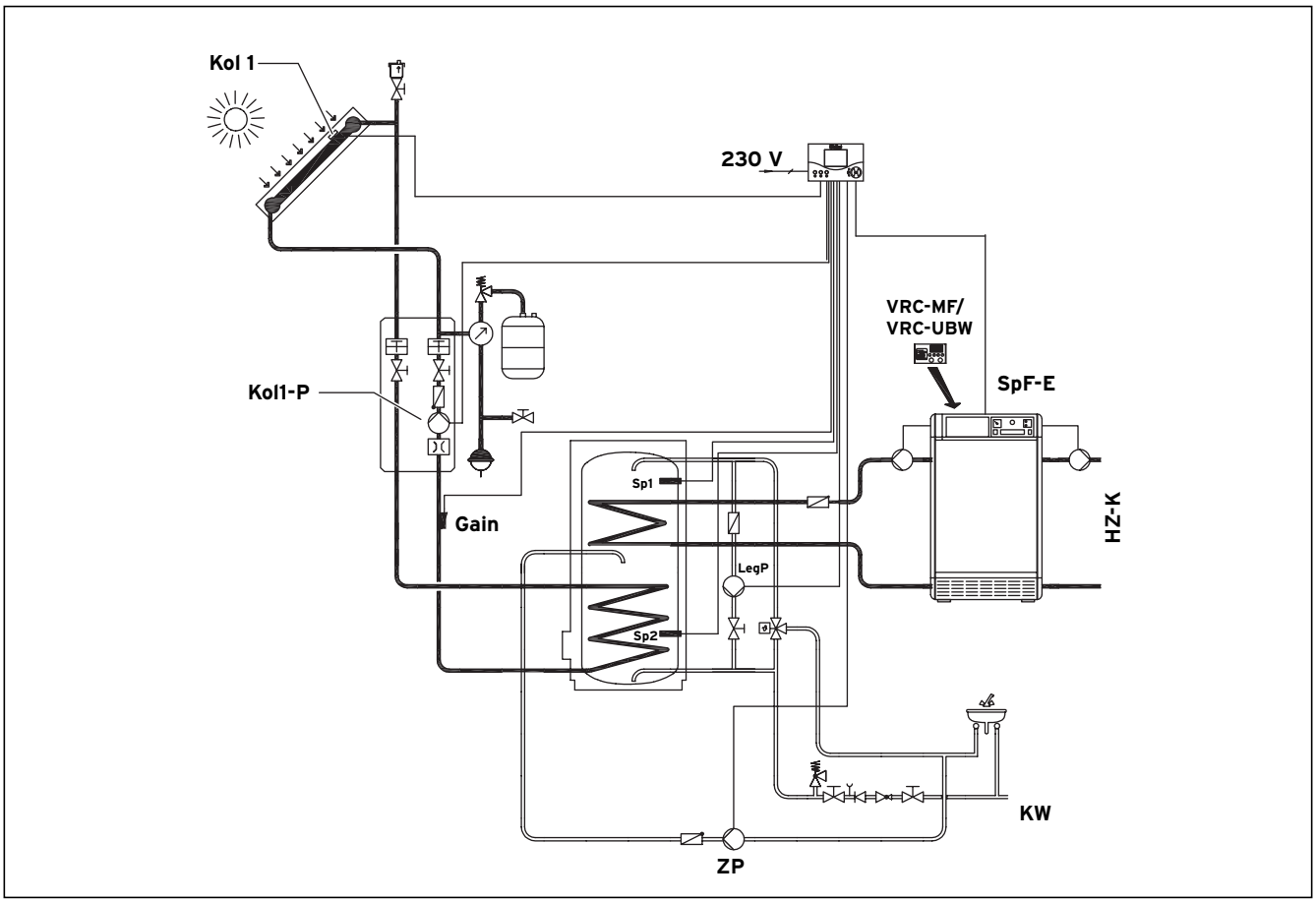

Fig. 5.13 Connecting older boilers with "hot water capable" heating controllers, e.g., VRC-MF

Designation in hydraulic plan/ wiring diagram	Components
VRC-MF/VRC-UBW	VRC-MF or VRC-UBW (heating controller in the boiler)
SpF-E	Heating controller cylinder sensor entrance
HZ-K	Heating circuit
KW	Cold water
ZP	Circulation pump
Kol1-P	Solar circuit pump 1
Kol 1	Collector sensor 1
Ertrag	Gain
LegP	Anti-Legionnaire's pump
Sp1	Cylinder sensor 1
Sp2	Cylinder sensor 2
230 V	230 V main power connection
VK / VRC	Boiler with VRC-UBW or VRC-MF
KF	Boiler sensor 1
Bus / FBG	Connection for remote-control device

Designation in hydraulic plan/ wiring diagram	Components
SpF	Cylinder sensor
DCF / AF	DCF external sensor
ext. St.	External error message
1. St.	External control level 1
2. St.	External control level 2
GW	Gas pressure monitor
AK	Flue gas flap
WM	Water shortage protection
ext. M	External solenoid valve
UV / LP	Switching valve / filling pump
HP	B-circuit heating pump
230 V~	Fuses
F 1, F 2	Fuses

Table 5.8 Key for Fig. 5.13 and Fig. 5.14

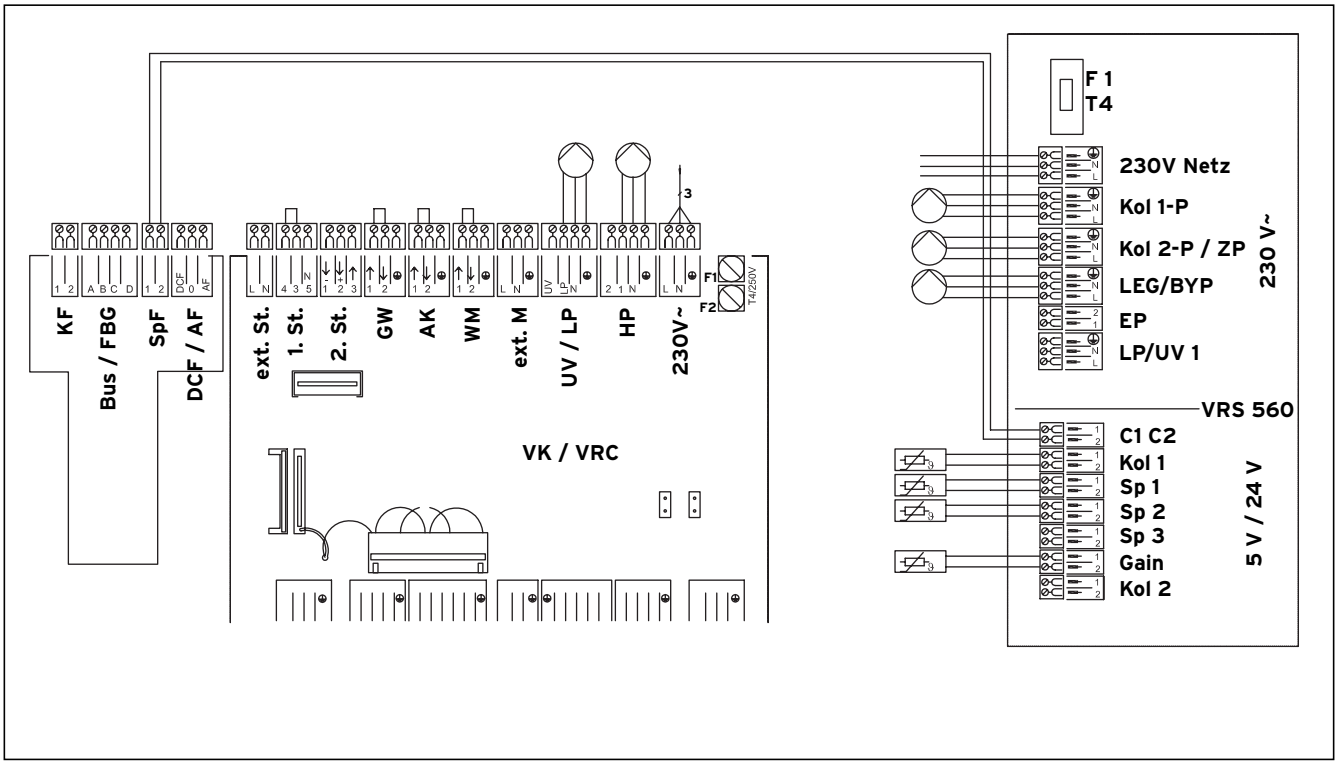

Fig. 5.14 Wiring diagram for special plan: Connecting older boilers with "hot water capable" heating controllers, e.g., VRC-MF

6 Start-up

6.1 Setting the system parameters

Certain system parameters have to be set in order to optimise the system for the respective conditions. These parameters are all together on one operating level and should only be set by the heating engineer.
You can access this operating level by pressing the programming button "P" for approx. 3 seconds.

Then you can call up all of the system parameters successively by clicking the dial. You can adjust the values you want by turning the dial. The adjusted value is saved with one click.
When you press the P button, the display returns to basic operating level without saving the adjusted value.
The following table gives an overview of all system parameters and their factory settings:

Display	Turn the dial to adjust	Setting range	Factory setting
HYD : 1	Changing the hydraulic plan	1, 2, 3	1
FLOW: 0	Setting the flow rate When setting the the required flow rate, please observe the measurement units used for the flow rate limiter installed!	0 – 9990 l/h	0
SRES: 0	Resetting the solar yield. The solar yield is reset to 0 by turning the dial to 1.	-	-
PRES: 0	Resetting the operating hours. The operating hours are reset to 0 by turning the dial to 1.	-	-
MAXT 1 :75°C	Setting the max. temperature for cylinder 1	20 to 80 °C	75 °C
dON 1 : 7°C	Setting the activation difference for cylinder 1 (The activation difference should always be 2 K greater than the deactivation difference)	5 – 12 K	7 K
dOFF 1 : 3°C	Setting the deactivation difference for cylinder 1 (The deactivation difference should always be 2 K less than the activation difference)	1 – 10 K	3 K

Table 6.1 System parameters

Display	Turn the dial to adjust	Setting range	Factory setting
MAXT 2 :60°C	Setting the max. temperature for cylinder 2	20 - 80 °C	60 °C
dON 2 : 7°C	Setting the activation difference for cylinder 2 (The activation difference should always be 2 K greater than the deactivation difference)	5 – 12 K	7 K
dOFF 2 : 3°C	Setting the deactivation difference for cylinder 2 (The deactivation difference should always be 2 K less than the activation difference)	1 – 10 K	3 K
LEG : 0	Activating the anti-Legionnaire's disease program	0=off; 1=day; 2=night	0=off
DEL : 0	Activating the reheating delay function	0=deactivated; 1=activated	0
ED : 0	Activating duration controlling	0=off; 1=on	0
DAY : 1	Setting the current day	1 - 31	0
MON : 1	Setting the current month	1 - 12	0
YEAR: 2000	Setting the current year	2000 - 2015	2000

Table 6.1 System parameters (continued)

6.2 Resetting system parameters to the default settings

You can reset the system parameters and the timer programs to the default settings by pressing the programming button "P" for ten seconds. Then the display flashes three times and all of the parameters are reset to the factory defaults.

7 Service/diagnostic level

You can access the service/diagnostic level by simultaneously pressing the programming button "P" and the dial for approx. 3 seconds.

Display	Actuators/sensor values	Test procedure
K 1P 0n	Collector pump 1 test	Collector pump 1 on, all other actuators off
K2P 0n	Collector pump 2 test or circulation pump test (for hydraulic plan 1)	Collector pump 2 on, all other actuators off
UV 1 0n	Switching valve test	Switching valve on, all other actuators off
LEGP 0n	Anti-Legionnaires' pump test	Anti-Legionnaires' pump on, all other actuators off
EP 0n	Electric heating rod (EP) test	Test electric heating rod on, all other actuators off
C 1C2 0n	C1/C2 contact test	C1/C2 contact closed, all other actuators off
SP 1 37°C	Cylinder temperature display for cylinder sensor 1	

Table 7.1 Actuators and sensors

Display	Actuators/sensor values	Test procedure
SP2 50°C	Cylinder temperature display for cylinder sensor 2	
SP3 58°C	Temperature display for cylinder sensor 3	
KOL 1 73°C	Temperature display for collector sensor 1	
KOL2 68°C	Temperature display for collector sensor 2	
RF 13°C	Temperature display for return flow (yield sensor)	

Table 7.1 Actuators and sensors (continued)

You can check the visual display by clicking on the dial again.

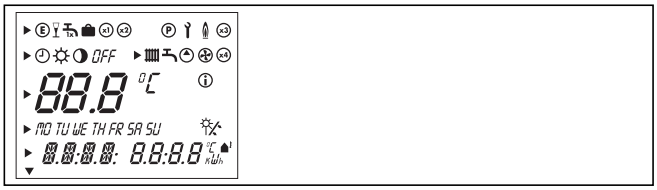

Fig. 7.1 Check visual display

With another click, the current version of the controller's software is displayed.

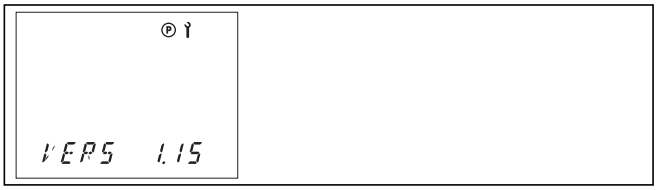

Fig. 7.2 Controller software version

You can exit the service/diagnostic level by pressing the programming button.

8 Emergency mode

When the auroMATIC 560 detects an error, its basic display always shows the error. If either the solar yield or reheating function is possible, the controller carries out this function in spite of the error.

9 Vaillant customer service

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

10 Technical data

Features	Units	auroMATIC 560
Operating voltage Controller current consumption Contact load of output relays (max.) Maximum total current	V AC/Hz W A A	230/50 max. 10 2 4
Shortest switching interval Power reserve Maximum ambient temperature Sensor operating voltage	min min °C V	10 30 50 5
Minimum cross-sections		
Sensor wires	mm^2	0.75
230 V power wires	mm^2	1.5
Controller housing dimensions		
Height	mm	175
Width	mm	272
Depth	mm	55
Level of protection Protection class for controller		IP 20 II

Table 10.1 Technical data

11 Sensor characteristics

VR 10 standard sensor, type NTC 2.7 K

Sensor values	Resistance value
0 °C	9191 Ohm
5 °C	7064 Ohm
10 °C	5214 Ohm
20 °C	3384 Ohm
25 °C	2692 Ohm
30 °C	2158 Ohm
40 °C	1416 Ohm
50 °C	954 Ohm
60 °C	658 Ohm
70 °C	463 Ohm
80 °C	333 Ohm
120 °C	105 Ohm

Table 11.1 VR 10 standard sensor characteristics

VR 11 standard sensor, type NTC 10 K

Sensor values	Resistance value
-20 °C	97070 Ohm
-10 °C	55330 Ohm
-5 °C	42320 Ohm
0 °C	32650 Ohm
5 °C	25390 Ohm
10 °C	19900 Ohm
15 °C	15710 Ohm
20 °C	12490 Ohm
25 °C	10000 Ohm
30 °C	8057 Ohm
35 °C	6532 Ohm
40 °C	5327 Ohm
50 °C	3603 Ohm
60 °C	2488 Ohm
70 °C	1752 Ohm
80 °C	1258 Ohm
90 °C	918 Ohm
100 °C	680 Ohm
110 °C	511 Ohm
120 °C	389 Ohm
130 °C	301 Ohm

Table 11.2 VR 11 standard sensor characteristics

00 2000 8427_00 GB 08 2005

Vaillant Ltd
Vaillant House ▪ Medway City Estate ▪ Trident Close ▪ Rochester ▪ Kent ME2 4EZ
Telephone 01634 292300 ▪ Fax 01634 290166 ▪ www.vaillant.co.uk ▪ info@vaillant.co.uk