

Heating-Controller HCC 6

Weather controlled heat circuit regulator
Installation and operating instructions



Read carefully before installation, commissioning and operation

Content

A.1. - EC declaration of conformity	3	5.1.7. - Reference/actual -	22
A.2. - General instructions	3	5.1.8. - Reference/actual +	23
A.3. - Explanation of symbols	3	5.1.9. - Delay	23
A.4. - Changes to the unit	4	5.1.10. - min. flow (heating)	23
A.5. - Warranty and liability	4	5.1.11. - max. flow (heating)	23
		5.2. - Settings cooling	24
B.1. - Specifications	5	5.2.1. - Cooling correction	24
B.2. - Temperature resistance table for Pt1000 sensors	5	5.2.2. - Off hysteresis	24
B.3. - About the controller	6	5.2.3. - On hysteresis	25
B.4. - Scope of supply	6	5.2.4. - Slope reference flow	25
B.5. - Disposal and pollutants	6	5.2.5. - Room reference cooling	25
B.6. - Hydraulic variants	7	5.2.6. - Min. flow cool	25
		5.2.7. - Max. flow cool	25
		5.2.8. - Delay	25
C.1. - Wall installation	8	5.2.9. - Cool storage	25
C.2. - Electrical connection	9	5.3. - Dehumidifier	26
C.3. - Installing temperature sensors	10	5.3.1. - Reference humidity	26
		5.4. - Manual humidity	26
C.4. - Electrical terminals	11	5.5. - Room controller	27
		5.5.1. - Influence room temperature	27
E.1. - Display and input	12	5.5.2. - Room ref. day	27
E.2. - Commissioning help	13	5.5.3. - Room ref. night	27
E.3. - Free commissioning	13		
E.4. - Menu sequence and menu structure	14	6. - Protective functions	28
1. - Measurements	15	6.1. - Anti-seizing	28
		6.2. - Frost protection	28
2. - Statistics	16	7. - Special functions	29
2.1. - Today	16	7.1. - Sensor calibration	29
2.2. - 28-days	16	7.2. - Commissioning	29
2.3. - Operating hours Heat Circuit	16	7.3. - Factory settings	29
2.4. - Operating hours Cooling	16	7.4. - Expansions	30
2.5. - Operating hours add. heating	16	7.5. - Mixer	30
2.6. - Error messages	16	7.5.1. - Turn time	30
2.7. - Reset / clear	16	7.5.2. - Pause-Factor	30
		7.5.3. - Increase	30
3. - Times	17		
3.1. - Time & Date	17	8. - Menu lock	31
3.2. - Heating circuit day	17		
3.3. - Heating Comfort	17	9. - Service values	32
3.4. - Cooling times	17		
4. - Operating modes	18	10. - Language	33
4.1. - Heating circuit	18	Z.1. Malfunctions with error messages	34
4.2. - Cooling	18	Z.2. Replacing the fuse	35
4.3. - Dehumidifier	19	Z.3. Maintenance	35
4.4. - Manual	19		
4.5. - Heat circuit reference	19		
4.6. - 14 day reference	19		
5. - Settings	20		
5.1. - Heat circuit	20		
5.1.1. - Su/Wi Day	20		
5.1.2. - Su/Wi night	20		
5.1.3. - Curve	21		
5.1.4. - Day correction	22		
5.1.5. - Night correction	22		
5.1.6. - Comfort temperature boost	22		

Safety instructions

A.1. - EC declaration of conformity

By affixing the CE mark to the unit the manufacturer declares that the HCC 6 conforms to the following relevant safety regulations:

- EC low voltage directive
73/23/EEC, as amended by 93/68/EEC
- EC electromagnetic compatibility directive
89/336/EEC version 92/31/EEC version 93/68/EEC

Conformity has been verified and the corresponding documentation and the EC declaration of conformity are kept on file by the manufacturer.

A.2. - General instructions

It is essential that you read this!

These installation and operating instructions contain basic instructions and important information regarding safety, installation, commissioning, maintenance and the optimal use of the unit. Therefore these instructions must be read completely and understood by the installation technician/ specialist and by the system user before installation, commissioning and operation of the unit.

The valid accident prevention regulations, VDE regulations, the regulations of the local power utility, the applicable DIN-EN standards and the installation and operating instruction of the additional system components must also be observed. The controller does not under any circumstances replace any safety devices to be provided by the customer!

Installation, electrical connection, commissioning and maintenance of the unit may only be carried out by specialists who possess the appropriate training. **For the user:** Make sure that the specialist gives you detailed information on the function and operation of the controller. Always keep these instructions in the vicinity of the controller.

A.3. - Explanation of symbols



Failure to observe these instructions can result in danger to life from electric voltage.



Failure to observe these instructions can result in serious damage to health such as scalding, or even life-threatening injuries.



Failure to observe these instructions can result in destruction of the unit or the system, or damage to the environment.



Information which is especially important for the function and optimal use of the unit and the system.

Safety instructions

A.4. - Changes to the unit



Changes to the unit can compromise the safety and function of the unit or the entire system.

- Changes, additions to or conversion of the unit are not permitted without written permission from the manufacturer
- It is likewise forbidden to install additional components that have not been tested together with the unit
- If it becomes clear that safe operation of the unit is no longer possible, for example because of damage to the housing, then turn the controller off immediately
- Any parts of the unit or accessories that are not in perfect condition must be exchanged immediately
- Use only original spare parts and accessories from the manufacturer.
- Markings made on the unit at the factory must not be altered, removed or made illegible
- Only the settings actually described in these instructions may be made on the controller

A.5. - Warranty and liability

The controller has been manufactured and tested with regard to high quality and safety requirements. The unit is subject to the statutory guarantee period of two years from the date of sale.

The warranty and liability shall not include, however, any injury to persons or material damage that is attributable to one or more of the following causes:

- Failure to observe these installation and operating instructions
- Improper installation, commissioning, maintenance and operation
- Improperly executed repairs
- Unauthorised structural changes to the unit
- Installation of additional components that have not been tested together with the unit
- Any damage resulting from continued use of the unit despite an obvious defect
- Failure to use original spare parts and accessories
- Use of the device for other than its intended purpose
- Operation above or below the limit values listed in the specifications
- Force majeure

Description of controller

B.1. - Specifications

2.1 Specifications:

Mains Voltage	230VAC +/- 10%
Mains frequency	50...60Hz
Power consumption	2VA
Total switched power	460VA (Relay outputs 1-3)
Switched power per relay	460VA for AC1 / 185W for AC3
Internal fuse	2A slow blow 250V
Protection category	IP40
Protection class	II
Sensor inputs	5x Pt1000 temperature sensor 1x humidity sensor 1x Remote adjuster
Measuring range	-40 to 110°C

Permissible ambient conditions:

Ambient temperature	
for controller operation	0°C...40°C
for transport/storage	0°C...60°C
Air humidity	
for controller operation	max. 85% humidity at 25°C
for transport/storage	no moisture condensation permitted

Other specifications and dimensions

Housing design	2-part, ABS plastic
Installation methods	Wall installation, optionally panel installation
Overall dimensions	163mm x 110mm x 52mm
Aperture installation dimensions	157mm x 106mm x 31mm
Display	Fully graphical display 128 x 64 dots
Light diode	Multicolour
Operation	4 entry keys

Temperature sensors:	(may not be included in the scope of supply)
Immersion sensor	Pt1000, e.g. immersion sensor TT/P4
Pipe-mounted sensor	Pt1000, e.g. pipe-mounted sensor TR/P4
Outdoor sensor	Pt1000, e.g. outdoor sensor TA52
Remote adjuster	Pt1000, Typ RC22
Sensor leads	2x0.75mm ² extendable up to 30m

B.2. - Temperature resistance table for Pt1000 sensors

°C	0	10	20	30	40	50	60	70	80	90	100
Ω	1000	1039	1077	1116	1155	1194	1232	1270	1308	1347	1385

Description of controller

B.3. - About the controller

The weather controlled Heat Circuit Controller HCC 6 facilitates efficient use and function control of your heating system. The device is impressive most of all for its functionality and simple, almost self-explanatory operation. For each step in the input process the individual entry keys are assigned to appropriate functions and explained. The controller menu contains headwords for the measured values and settings, as well as help texts or clearly-structured graphics.

The HCC6 is a weather controlled Heating controller with heating request and for systems with one controlled heat circuit (=with mixer) and cooling function via air cooling system.

Important characteristics of the HCC6:

- Depiction of graphics and texts in a lighted display
- Simple viewing of the current measurement values
- Statistics and monitoring of the system by means of statistical graphics, etc.
- Extensive setting menus with explanations
- Menu block can be activated to prevent unintentional setting changes
- Resetting to previously selected values or factory settings
- various additional functions are or will be available e.g. 0...10V connection for boiler control

B.4. - Scope of supply

- Heating controller HCC 6
- 3 screws 3,5x35mm and 3 plugs 6mm for wall installation
- 6 strain reliefs with 12 screws, replacement fuse 2AT
- installation and operating instructions HCC 6

Optionally contained depending on design/order:

- 1x outdoor sensor e.g. TA52 (Pt1000)
- 1-2x pipe-mounted sensor e.g. TR/P4 (Pt1000)
- 1x buffer sensor e.g. TT/P4 (Pt1000)
- 1x Indoor sensor/remote adjuster with mode switch RC22
- 1x Immersion sleeve e.g. TH150
- various additional functions expansion boards

B.5. - Disposal and pollutants

The unit conforms to the European RoHS directive 2002/95/EC for the restriction of the use of certain hazardous substances in electrical and electronic equipment.



Caution

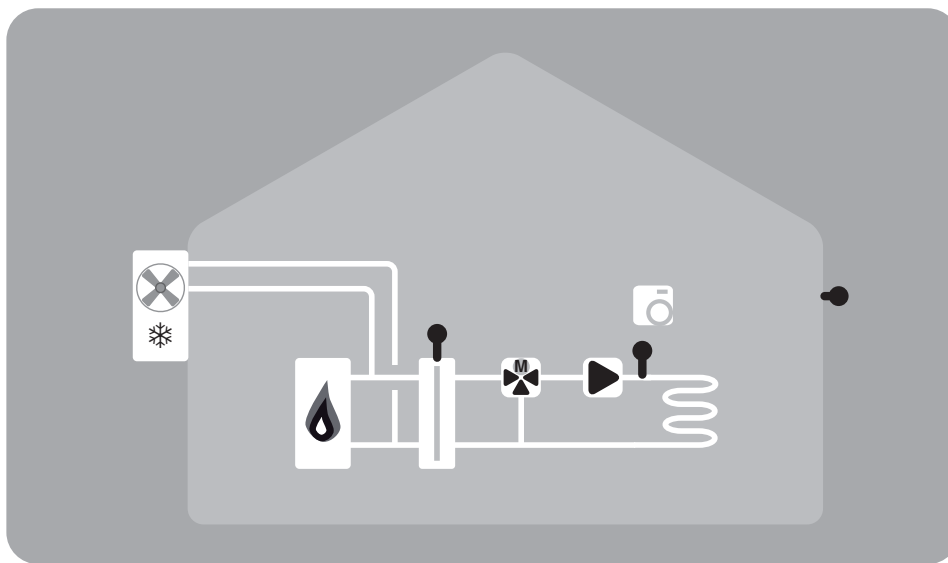
The unit must not under any circumstances be disposed of with ordinary household refuse. Dispose of the unit only at appropriate collection points or ship it back to the seller or manufacturer.

Description of controller

B.6. - Hydraulic variants



The following illustrations should be viewed only as schematic diagrams showing the respective hydraulic systems, and do not claim to be complete. The controller does not replace safety devices under any circumstances. Depending on the specific application, additional system components and safety components may be mandatory, such as check valves, non-return valves, safety temperature limiters, scalding protectors, etc., and must therefore be provided.



Installation

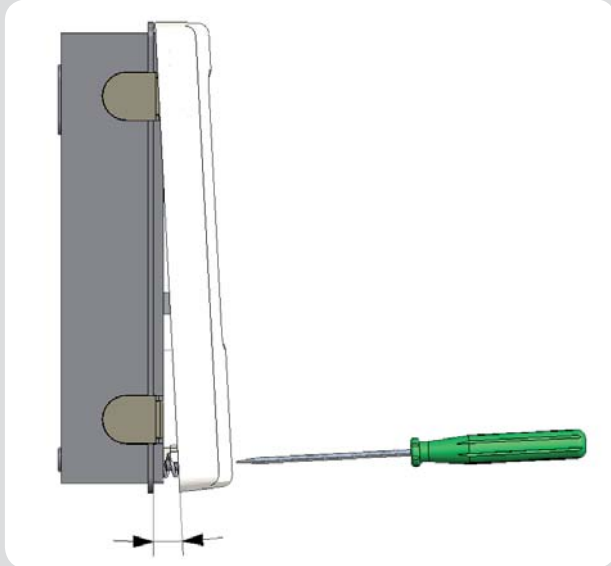
C.1. - Wall installation



Caution

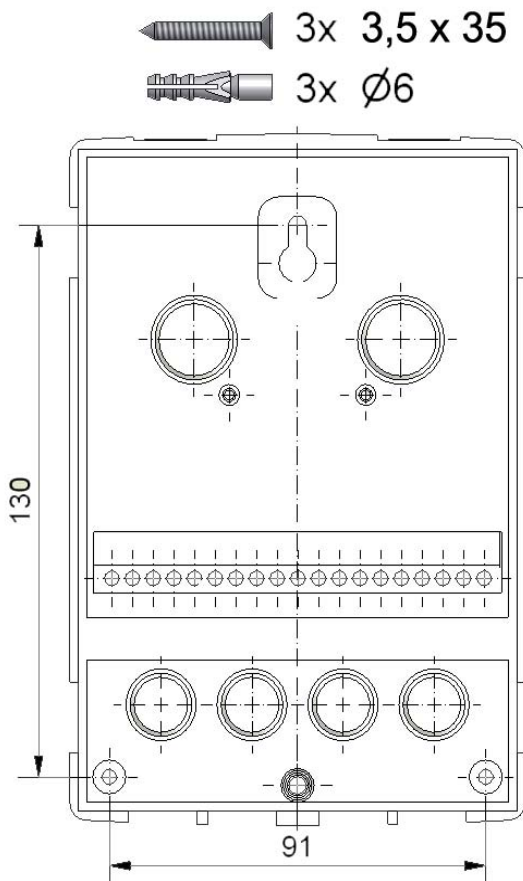
Install the controller only in dry areas and under the ambient conditions described under B.1 „Specifications“. Carry out the following steps 1-8.

C.1.1.



1. Unscrew cover screw completely
2. Carefully pull upper part of housing from lower part.
3. Set upper part of housing aside, being sure not to touch the electronics when doing so.
4. Hold the lower part of the housing up to the selected position and mark the 3 mounting holes. Make sure that the wall surface is as even as possible so that the housing does not become distorted when it is screwed on.

C.1.2.



5. Using a drill and size 6 bit, drill 3 holes at the points marked on the wall and push in the plugs.
6. Insert the upper screw and screw it in slightly.
7. Fit the upper part of the housing and insert the other two screws.
8. Align the housing and tighten the three screws.



Caution

For panel installation, a special installation set is available as an accessory.

Installation

C.2. - Electrical connection



Before working on the unit, switch off the power supply and secure it against being switched on again!
Check for the absence of power!
Electrical connections may only be made by a specialist and in compliance with the applicable regulations. The controller may not be put into operation if there is visible damage to the housing, e.g. cracks.



Low-voltage cables such as temperature sensor cables must be routed separately from mains voltage cables. Feed temperature sensor cables only into the left-hand side of the unit, and mains voltage cables only into the right-hand side.

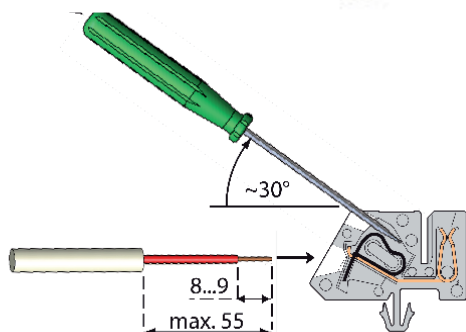
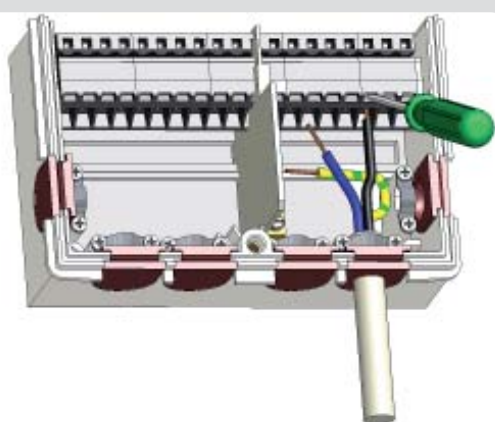


The cables being connected to the unit must not be stripped by more than 55mm, and the cable jacket must reach into the housing just to the other side of the strain relief.



The customer must provide an all-pole disconnecting device, e.g. a heating emergency switch.

C.2.1.



1. Open controller housing (see C.1)
2. Strip cables max. 55mm, insert, fit the strain relief devices, strip the last 8-9 mm of the wires. (Fig.C.2.1)
3. Open the terminals using a suitable screwdriver (Fig. C.2.1) and make electrical connections on the controller (Pages 11)
4. Refit upper part of housing and fasten with screw.
6. Switch on mains voltage and place controller in operation

Installation

C.3. - Installing temperature sensors

The controller operates with Pt1000 temperature sensors which are accurate to the degree, thus ensuring optimal control of system functions.



Caution

If needed the sensor cables can be extended to a maximum of 30m using a cable with a cross-section of at least 0.75mm². Make sure that there is no contact resistance!

Position the sensor precisely in the area to be measured!

Only use immersion, pipe-mounted or flat-mounted sensor suitable for the specific area of application with the appropriate permissible temperature range.



Caution

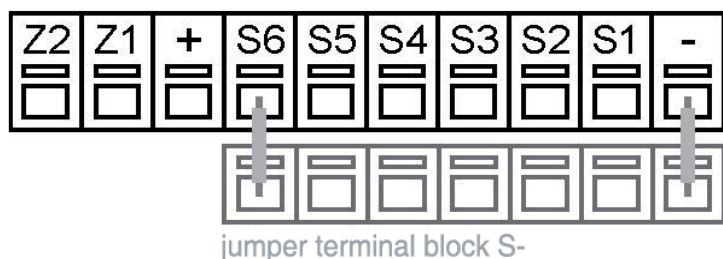
The temperature sensor cables must be routed separately from mains voltage cables, and must not, for example, be routed in the same cable duct!

Installation

C.4. - Electrical terminals



Left-hand terminal compartment only for low voltage if max. 12VAC/DC



Connections low voltage:

- Temperature sensors S1 - S6 and jumper terminal block S- (polarity freely selectable)
- Only connect potential free relay to Z1 and Z2, max 24V

Low voltage max. 12VAC/DC connection in the left-hand terminal compartment!

<u>Terminal:</u>	<u>Connection for:</u>
-	Jumper terminal block S-
S1	Outdoor
S2	Flow
S3	Storage (optional)
S4	Roomtemp.sensor RC22
S5	Humidity sensor RC22
S6	Remote adjuster*
+	12VDC RC22
Z1	Dehumidifier
Z2	Dehumidifier
	pot.free. relay, only low voltage max 24V

Use terminal block S- for connecting the sensor earths of S1-S6.

The polarity of the sensors is freely selectable.

* please note: When Remote Adjuster RC22 or an external potential free thermostat is connected, the bridge at S6 has to be removed.

** R4 on = Cooling mode, R4 off = Heating mode.



Right-hand terminal compartment only for mains voltages of 230VAC 50-60Hz



Connections Mains Voltage:

- Protective conductor PE metal terminal block
- Neutral conductor terminal block N
- Mains phase conductor L
- Switch output R1-R4
- Floating contact at R5/R5I

Caution: Only suitable for 230V!

Mains Voltage 230VAC 50-60Hz connection in the right-hand terminal compartment.

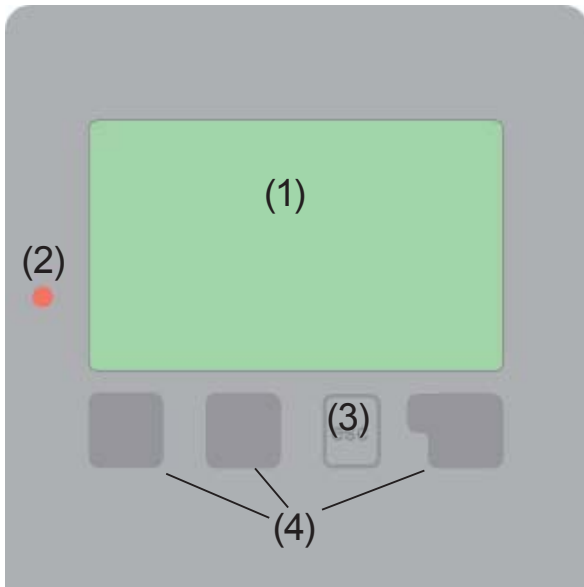
<u>Terminal:</u>	<u>Connection for:</u>
N	Jumper terminal block N
L	Mains phase conductor L
R1	Heat circuit pump
R2	Mixer open
R3	Mixer close
R4	Cooling/Heating mode**
R5	add. heating/cooling
R5I	add. heating/cooling

The PE protective conductor must be connected to the PE metal terminal block!

Relay R4 and R5 optional

Operation

E.1. - Display and input



Examples of display symbols:



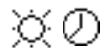
Heat circuit pump
(rotates when active)



Heat circuit mixer
(solid when opening or closing)



Heating / Winter mode
Cooling / Summer mode



Hc-Daymode (time progr)



Hc-Nightmode (time progr)



Hc-Comfortmode (time progr)



Continuous day mode



Continuous night mode



add. heating active



Reference value



14 day reference value



External Thermostat off



Dehumidifier



Cooler



Warnings / Error messages



New message

The display (1), with its extensive text and graphics mode, is almost self-explanatory, allowing easy operation of the controller.

The LED (2) lights up green when a relay is switched on.

The LED (2) lights up red when operating mode „Off“ is set.

The LED (2) flashes slowly red in the operating mode „Manual“.

The LED (2) flashes quickly red when an error is present.

Entries are made using four keys (3+4), to which different functions are assigned depending on the situation. The „esc“ key (3) is used to cancel an entry or to exit a menu. If applicable there will be a request for confirmation as to whether the changes which have been made should be saved. The function of each of the other three keys (4) is shown in the display line directly above the keys; the right-hand key is generally has a confirmation and selection function.

Examples of key functions:

+/- = enlarge/shrink values

▼/▲ = scroll menu down/up

yes/no = approve/reject

Info = additional information

Back = to previous screen

ok = confirm selection

Confirm = confirm setting

Operation

E.2. - Commissioning help



The first time the controller is turned on and after the language and time are set, a query appears as to whether you want to parametrise the controller using the commissioning help or not. The commissioning help can also be terminated or called up again at any time in the special functions menu. The commissioning help guides you through the necessary basic settings in the correct order, and provides

brief descriptions of each parameter in the display. Pressing the „esc“ key takes you back to the previous value so you can look at the selected setting again or adjust it if desired. Pressing the „esc“ more than once takes you back step by step to the selection mode, thus cancelling the commissioning help. Finally, menu 4.3 operating mode „Manual“ should be used to test the switch outputs with the consumers connected, and to check the sensor values for plausibility. Then switch on automatic mode.



Caution

Observe the explanations for the individual parameters on the following pages, and check whether further settings are necessary for your application.

E.3. - Free commissioning

If you decide not to use the commissioning help, you should make the necessary settings in the following sequence:

- Menu 10. Language
- Menu 3. Time, date and operating times
- Menu 5 Settings for heat circuit, all settings
- Menu 6. Settings for cooling, all settings
- Menu 7 Protective functions if necessary
- Menu 8. Special functions if necessary

Finally, menu 4.3 operating mode „Manual“ should be used to test the switch outputs with the consumers connected, and to check the sensor values for plausibility. Then switch on automatic mode.

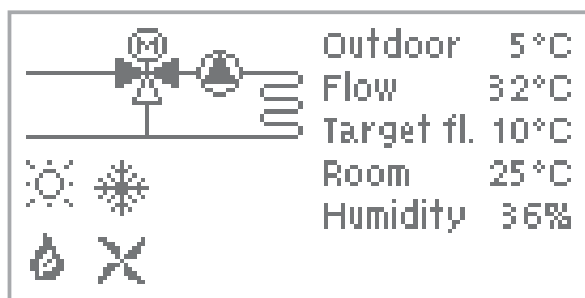


Caution

Observe the explanations for the individual parameters on the following pages, and check whether further settings are necessary for your application.

Operation

E.4. - Menu sequence and menu structure



The graphics or overview mode appears when no key has been pressed for 2 minutes, or when the main menu is exited by pressing „esc“.



Pressing a key in graphics or overview mode takes you directly to the main menu. The following menu items are then available for selection there:



1. Measurements

Current temperature values with explanations

2. Statistics

Function control of the system with operating hours, etc.

3. Times

Operating times for heating, setting the clock and date

4. Operating mode

Settings the operating mode for the heat circuit

5. HC settings

Settings for the heat circuit

6. Cool. settings

Settings for cooling

7. Protections

Set the protective functions like Anti-seizing, Frost protection, etc.

8. Special functions

Sensor calibration, Remote adjuster, Mixer, etc.

9. Menu block

Protect against unintentional setting changes at critical points

10. Service values

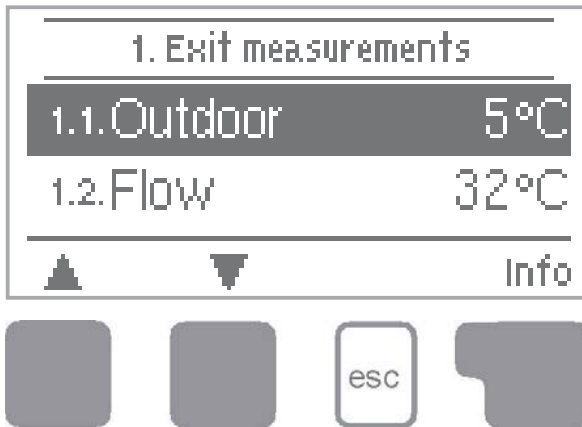
For diagnosis in the event of an error

11. Language

Selection of the menu language

Measurements

1. - Measurements



Menu "1. Measurement values" is used to display the currently measured temperatures.

The menu is closed by pressing "esc" or selecting "Exit measurement values".



Selecting "Info" leads to a brief help text explaining the measurement values.

Selecting "Overview" or "esc" exits the Info mode.



Caution

If "Error" appears on the display instead of the measurement value, then there may be a defective or incorrect temperature sensor.

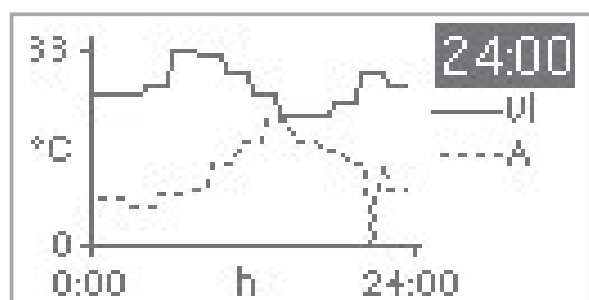
If the cables are too long or the sensors are not placed optimally, the result may be small deviations in the measurement values. In this case the display values can be compensated for by making entries on the controller.

Follow the instructions under 8.1.

What measurement values are displayed depends on the selected program, the connected sensors and the specific device design.

Statistics

2. - Statistics



Menu “2. Statistics” is used for function control and long-term monitoring of the system.

The menu is closed by pressing “esc” or selecting “Exit statistics”.



Caution

For system data statistics it is essential for the time to be set accurately on the controller. Please note that the clock continues to run for about 24 hours if the mains voltage is interrupted, and after that has to be reset. Improper operation or an incorrect time may result in data being cleared, recorded incorrectly or overwritten.

The manufacturer accepts no liability for the recorded data!

2.1. - Today

Flow temperature for the present day

In the graphical overview the characteristics of outdoor-and flow temperature for the present day is shown from 0-24h. The right button changes the unit of time and the two left buttons scroll through the diagram.

2.2. - 28-days

Flow temperature during the last 28 days

In the graphical overview the characteristics of the outdoor and flow temperature during the last 28 days is shown. The right button changes the unit of time (Days) and the two left buttons scroll through the diagram.

2.3. - Operating hours Heat Circuit

Displays the operating hours of the heat circuit.

2.4. - Operating hours Cooling

Displays the operating hours for cooling

2.5. - Operating hours add. heating

Displays the operating hours for additional heating

2.6. - Error messages

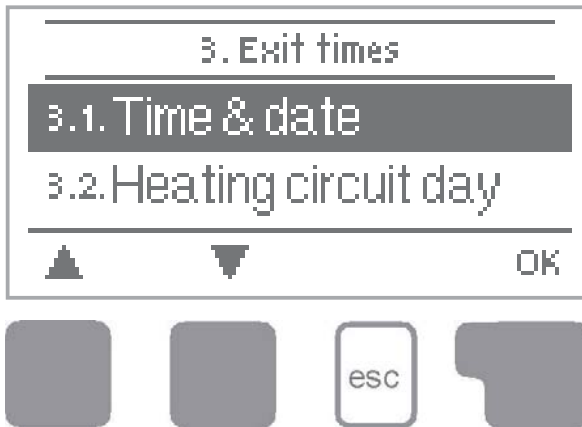
Display of the last three errors in the system with indication of date and time.

2.7. - Reset / clear

Resetting and clearing the individual statistics. Selecting “All statistics” clears everything except for the error log.

Times

3. - Times



Menu “3. Times” is used to set the time, date, operating times for the heating circuit.



Caution

The associated temperature reference values are specified in menu 5 “Settings”!

The menu is closed by pressing “esc” or selecting “Exit display mode”.

3.1. - Time & Date

This menu is used to set the current time and date.



Caution

For proper functioning of the controller and statistics for the system data it is essential for the time to be set accurately on the controller. Please note that the clock continues to run for about 24 hours if the mains voltage is interrupted, and after that has to be reset.

3.2. - Heating circuit day

This menu is used to select the daytime mode times for the heating circuit; three time periods can be specified for each weekday and copied over to the following days.

Setting range: Three time ranges for each day of the week

Default: Mo-Su 6:00-22:00

Note: See 5. for the associated temperature settings

3.3. - Heating Comfort

This menu can be used to select a time range for each day of the week in which the heating circuit is supplied with an increased comfort temperature, e.g. for quick heating in the morning.

Setting range: One time range for each day of the week

Default: Mo-Su off

Note: See 5. for the associated temperature settings.



Caution

Times that are not specified are automatically considered to be night-time mode. The set times are only taken into account in the heating circuit operating mode “Automatic”

3.4. - Cooling times

This menu is used to select the Cooling mode times; three time periods can be specified for each weekday and copied over to the following days.

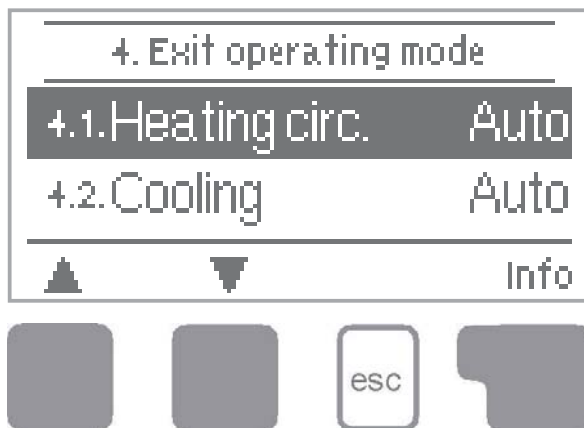
Setting range: Three time ranges for each day of the week

Default: Mo-Su Off

Note: See 6. for the associated temperature settings

Operating modes

4. - Operating modes



Menu “4. Operating modes” is used to specify the operating modes for the heating circuit.

After an interruption of the mains voltage the controller automatically returns to the last operating mode selected!

The menu is closed by pressing “esc” or selecting “Exit operating modes”.



Caution

The controller works with the set operating times and the corresponding different reference flow temperature values only in the automatic mode.

4.1. - Heating circuit

Auto = Automatic/Normal mode using the set times.

Continuous Day = The set values for day mode are used.

Continuous Night = The set values for night mode are used.

Reference Value = Fixed flow temperature regardless of the outdoor temperature. The desired flow temperature has to be set in menu „4.5. - Heat circuit reference“.

14 day reference value = Specific fixed flow temperatures can be set for the next 14 days in menu „4.6. - 14 day reference“. After 14 days, the reference temperature of the 14th day is used until the operating mode is changed.

Off = Heating circuit is switched off (except Frost protection)

Heating can also be turned off by turning the dial of the RC22 to minimum.

Settings range: Auto, Continuous day, Continuous night, Reference value, 14 day reference, Off

Default: Automatic



Caution

Heating can also be turned off by turning the dial of the RC22 to minimum.

4.2. - Cooling

Auto = Automatic/Normal mode using the set times.

Off = Cooling is switched off

A/C = Cooling is switched on when room temperature is higher than “Room ref.” see „5.2.5. - Raum-Soll-Kühlung“

Settings range: Auto, Off, A/C

Default: Auto

Operating modes

4.3. - Dehumidifier

Summer = Dehumidifier is active when the temperature set in S/W day resp. S/W night is exceeded.

All year = Dehumidifier tries to keep the humidity level all time.

Off = Dehumidifier switched off

Settings range: Summer, All year, Off

Default: Off

4.4. - Manual

In Manual mode the individual relay outputs and the connected consumers can be checked for proper functioning and correct assignment.



The operating mode “Manual” may only be used by specialists for brief function tests, e.g. during commissioning!

Operating manual mode:

The relays and thus the connected consumer are switched on and off by pressing a key, with no regard to the current temperatures and the parameters which have been set.

4.5. - Heat circuit reference

If operating mode “Reference value” is selected in „4.1. - Heating circuit“, the reference flow temperature has to be set here, regardless of the curve/outdoor temperature.

Settings range: 10 °C to 75 °C

Default: 30 °C

4.6. - 14 day reference

If operating mode “14 day reference value” is selected, see „4.1. - Heating circuit“, the reference flow temperature for each of the 14 days can be set here.

In the first menu 4.6.1 the starting time of the program is shown. To start the program, hit restart, and the current time is the new starting time.

Hitting “restart” again will reset the 14 day reference program and start it at day 1.

Settings Heat circuit

5. - Settings

5.1. - Heat circuit



The necessary basic settings required for the control function of the heating circuit are made in menu "5. Settings HC".



Caution

This does not under any circumstances replace the safety facilities to be provided by the customer!

The menu is closed by pressing "esc" or selecting "Exit settings".

5.1.1. - Su/Wi Day

If this value is exceeded at outdoor sensor S1 during the daytime mode times, the controller automatically switches the heating circuit off = Summer mode.

If the outdoor temperature drops below this value, the heating circuit is switched on again = Winter mode.

Settings range: from 0°C to 30°C / Default: 18°C



Caution

These settings apply during the daytime periods and periods with activated comfort boost.

5.1.2. - Su/Wi night

If this value is exceeded at outdoor sensor S1 during the nighttime mode times, the controller automatically switches the heating circuit off = Summer mode.

If the outdoor temperature drops below this value, the heating circuit is switched on again = Winter mode.

Settings range: 0°C to 30°C / Default: 12°C

Settings Heat circuit

5.1.3. - Curve

The characteristic curve is used to control the heat dissipation of the heating circuit relative to the outdoor temperature.

The demand for heat is different due to differences in the type of building/insulation/ type of heating/outdoor temperature. For this reason the controller can make use of a normal straight curve (Setting simple) or a split curve (Setting split).

In the simple setting the curve can be adjusted with the help of the graphic diagram. The slope is changed, and the calculated reference flow temperature is displayed for -12°C .

If the split mode is selected, the characteristic curve is adjusted in 3 steps. First the standard slope has to be set, after that the split point and finally the steepness of the curve after the split. While adjusting the curve the steepness of the slope and the calculated reference flow temperature for -12°C outdoor temperature is displayed.

Settings range:

Characteristic curve : simple or split / Default: simple

Slope : 0.0...3.0 / Default: 0.8

Splitpoint at outdoor temp.: $+10^{\circ}\text{C}$... -10°C

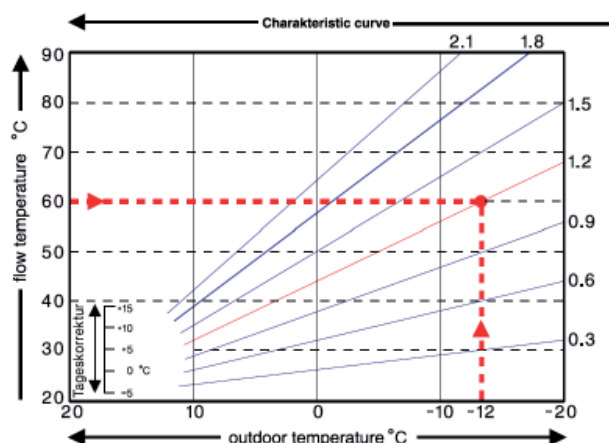
Angle: differs, depends on steepness and split point

The diagram shows the influence of the selected characteristic curve steepness (standard curve) on the calculated reference flow temperature of the heating circuit. The correct curve is appointed by setting the intersection point of the calculated maximum flow temperature and the minimum outdoor temperature.

Example:

Maximum calculated flow temperature 60°C at minimum outdoor temperature according to heat demand calculation -12°C .

The intersection results in a slope of 1.2.



Example:

Maximum calculated flow temperature 60°C at minimum outdoor temperature according to heat demand calculation -12°C . The intersection results in a slope of 1.2.

Settings Heat circuit



The following settings can be used for parallel translation of the characteristic for certain time periods such as daytime, nighttime and comfort mode.

5.1.4. - Day correction

parallel translation of the characteristic curve

The day correction produces a parallel translation of the heating characteristic during the daytime operating hours, since depending on the outdoor temperature it is possible that the building may not be optimally heated with the set characteristic. If the characteristic is not optimised, the following situation may occur:

in hot weather - the spaces are too cold

in cold weather - the spaces are too hot

In this case, one should gradually reduce the characteristic slope in steps of 0.2, each time raising the day correction by 2-4 °C.

This procedure can be repeated several times as needed.

Setting range: from -10°C to 50°C / default setting: 5 °C

5.1.5. - Night correction

parallel translation of the characteristic curve

The night correction produces a parallel translation of the heating characteristic during the nighttime operating hours. If a negative value is set for the night correction, the reference flow temperature is lowered accordingly during the nighttime operating hours.

In this manner, primarily at night, but also during the day when no-one is at home, the room temperature is lowered, thus saving energy.

Example: A day correction of +5°C and a night correction of -2°C produces a reference flow temperature in nighttime operation that is 7°C lower.

Setting range: from -30°C to 30°C / default setting: -2°C

5.1.6. - Comfort temperature boost

parallel translation of the characteristic curve

The comfort temperature boost is added to the set day correction. In this manner it is possible to carry out quick heating and/or a higher temperature in the living spaces at a certain time each day.

Setting range: from 0°C to 15°C / default setting: 0°C = off

5.1.7. - Reference/actual -

Switch-on hysteresis for additional heating

This setting determines the allowed undershoot of the heat circuit temperature under the calculated reference flow temperature. If the heat circuit flow temperature falls below the reference temperature by this value, the additional heating (R5) is activated after a delay of 5 minutes.

Settings range: -10°C to 10°C / Default: -2°C



The additional heating (relay R5) is started when the flow temperature is below the reference flow temperature for 5 minutes continuously.

Settings heat circuit

5.1.8. - Reference/actual +

Switch-off hysteresis for additional heating (only when S3 is connected)

This settings determines the allowed overstepping of the heat circuit temperature to the calculated reference flow temperature at sensor 3. If the temperature at S3 exceeds the reference flow temperature by this value, the additional heating (R5) is switched off.

Settings range: 1°C to 10°C / Default: 2°C



When sensor 3 is not connected, additional heating at relay 5 is switched off when sensor S2 reaches or exceeds the reference flow temperature.



To prevent unnecessary activation of additional heating it is recommended to install sensor 3 in the storage on the same level (or higher) as the heat circuit exits..

5.1.9. - Delay

Delay of additional heating and cooling

To prevent excessive oscillation when additional heating or cooling start, the corresponding relay is switched on up to 5 minutes after the switch-on conditions are met.

Settings range: 0 to 5 minutes / Default: 1 minute



Delay applies to cooling and heating (see 5.2.8).

5.1.10. - min. flow (heating)

This setting is the lower limit for the characteristic curve, thus the low limit for the heat circuit's reference temperature.

Additionally this is the reference temperature for the frost protection function.

Settings range : 5°C to 30°C / Default: 15°C

5.1.11. - max. flow (heating)

This settings is the upper limit for the heat circuit reference temperature.

If the heat circuit exceeds this value, it is switched off until the temperature drops below.

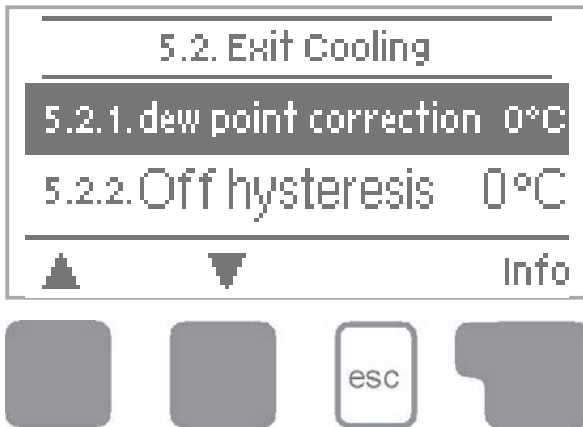
Settings range: 30 °C to 105 °C / Default: 45 °C



The user has to install an additional security temperature limiter / limiter thermostat, that has to be connected in series with the pump.

Settings cooling

5.2. - Settings cooling



The necessary basic settings required for the control of the cooling function are made in menu "6. Settings cooling"



Caution

This does not under any circumstances replace the safety facilities to be provided by the customer!

The menu is closed by pressing "esc" or selecting "Exit settings".

5.2.1. - Cooling correction

Parallel translates the dew point characteristic curve.

This curve is used to calculate and prevent unwanted condensation, which occurs when at a specific humidity the room temperature drops below a specific value (dew point). Usually the temperature should be higher than at dew point.

Cooling correction can be used to shift the calculated dew point by up to 10° C.

Example: Condensation occurs with the standard value => The dew point/room temperature should be higher.

Example: Condensation can be ignored, but a colder room temperature is needed => Temperature can be lower.

Settings range: -10° C to 10° C / Default: 0



Caution

Lowering the calculated dew point curve can result in condensation, which can facilitate e.g. mold.

5.2.2. - Off hysteresis

Switch off hysteresis for cooling

This setting is used to determine the allowed undershoot to the calculated reference flow temperature at sensors S3 or S2 (when connected S3, otherwise S2). When the temperature drops below this value, cooling is switched off.

Settings range: -10°C to 10°C / Default: 0°C



Caution

note: In menu 5.2.9. sensor S3 can be set to „ignore“

Settings cooling

5.2.3. - On hysteresis

This setting is used to determine the allowed overshoot of the flow temperature at sensor S2 over the calculated reference flow temperature. If the measured temperature at S2 exceeds the reference temperature for the time period set in 5.2.8, cooling is switched off.

Settings range: -10°C to 10°C / Default: 3°C

5.2.4. - Slope reference flow

Slope of the characteristic curve: Reference flow temperature

Changes the relation of room temperature and reference flow temperature for the cooling mode. The higher this value, the colder the reference flow temperature.

Settings range: 1.0 to 10.0 / Default: 2.0

5.2.5. - Room reference cooling

Room reference temperature in cooling mode

This temperature is the target temperature for the controlled room. The flow temperature is regulated accordingly.

Settings range: 15 to 30 / Default: 25

5.2.6. - Min. flow cool

Minimum flow temperature in cooling mode

This is the lower limit of the flow reference temperature for cooling.

Einstellbereich: 5 °C bis 20 °C / Voreinstellung: 10 °C

5.2.7. - Max. flow cool

Maximum flow temperature in cooling mode.

This is the upper limit of the flow reference temperature for cooling.

Einstellbereich: 20 °C bis 40 °C / Voreinstellung: 25 °C

5.2.8. - Delay

Delay of cooling and additional heating

To prevent switching of additional heating or cooling when temperature fluctuations occur, it is possible to delay the switching of the corresponding relay for up to 5 minutes. When the conditions are still met for the whole time, the relay is switched.

Settings range: 0 to 5 minutes / Default: 1 minute



Caution

Delay applies to heating and cooling (see also „5.1.9. - Delay“ on page 23)

5.2.9. - Cool storage

Yes: Cool down to Reference flow temperature + off hysteresis („5.2.2. - Off hysteresis“ on page 24) measuring at flow sensor S2 and buffer S3.

No: Cool down to Reference flow temperature + off hysteresis („5.2.2. - Off hysteresis“ on page 24) measuring at flow sensor S2, temperature at buffer S3 is ignored.

Settings range: Yes, No / Default: Yes

Dehumidifier

5.3. - Dehumidifier

5.3.1. - Reference humidity

Dehumidifier is active as long as the humidity is higher as the value set here. Hysteresis is fixed on 5%.

Settings range: 30 % to 60 % / Default: 50 %

5.4. - Manual humidity

When the humidity sensor S5 is shortcircuited in cooling mode "A/C", cooling function can operate with a manually fixed humidity value.

Einstellbereich: 50%-100% / Voreinstellung: 70%



Caution

This menu is only available when S5 is short circuited.



Caution

A short circuited at S5 in a different mode than "A/C" is displayed as error.



Danger

Manual humidity can lead to condensation, which can then lead to e.g. the formation of mold.

Use at your own risk!

Room controller

5.5. - Room controller

This menu is used to determine the settings for the room controller RC22. The menu is closed by pressing “esc” or selecting “Exit room controller”.



The RC22 is used to set the 3 operating modes Heating, Off and Cooling. Also the dial is used to influence the reference flow temperature (heating) respectively the reference room temperature (cooling) by parallel translating the characteristic curve.



The room controller is not used in the operating modes „Reference value“ and „14 days reference“.

5.5.1. - Influence room temperature

This menu is used to determine the influence the room temperature has on the reference flow temperature in heating mode. For every degree of difference between room temperature and reference room temperature the percentage set here is added to resp. subtracted from the calculated reference flow temperature. Limits like Min flow heating and Max flow heating do apply.

Example: Reference room temp.: 25 °C ; room temp.: 20 °C = 5 °C Difference.

Room reference.: e.g. 40 °C : Room controller: 10 % = 4 °C

5 X 4 °C = 20 °C Result: 20 °C are added to the reference flow temp. = 60 °C.

If Max. flow is below 60°, the result is equal to Max. flow.

Settings range: 0 % to 20 % / Default: 0

5.5.2. - Room ref. day

Room reference temperature during day time operation

The desired room temperature in day mode. As long as this condition is not met, the reference flow temperature is raised resp. lowered, depending on the value set in menu „5.5.1. - Influence room temperature“. When “influence room temperature” is set 0%, this settings is without effect.

Settings range: 10° C to 30° C / Default: 20° C

5.5.3. - Room ref. night

Room reference temperature during night time operation

The desired room temperature in night mode. As long as this condition is not met, the reference flow temperature is raised resp. lowered, depending on the value set in menu „5.5.1. - Influence room temperature“. When “influence room temperature” is set 0%, this settings is without effect.

Settings range: 10° C to 30° C / Default: 20° C

Protective functions

6. - Protective functions



Menu “6. Protective functions” can be used by specialists to activate and set various protective functions.



Caution

This does not under any circumstances replace the safety facilities to be provided by the customer!

The menu is closed by pressing “esc” or selecting “Exit settings”.

6.1. - Anti-seizing

If the anti-seizing protection is activated, the controller switches the heat pump and the mixer on consecutively at 12:00 pm for 5 seconds to prevent seizing of the pump/valve after long periods of inactivation.

Settings range: on, off/ Default: on

6.2. - Frost protection

Frost protection function can be activated for the heat circuit. If the outdoor temperature at sensor S1 drops below 1 °C and the heat circuit is switched off, the controller switches the heat circuit back on with the reference temperature set in menu 7.3 (min. flow temperature). As soon as the outdoor temperature exceeds 1°C the heat circuit is switched off again.

Frost protection - settings range: on, off / Default: on



Caution

Switching the frost protection function off or setting the minimum flow temperature too low can lead to severe damage of the system.

Special functions

7. - Special functions



Menu “7. Special functions” is used to set basic items and expanded functions.



Caution

The settings in this menu should only be made by a specialist.

The menu is closed by pressing “esc” or selecting “Exit special functions”.

7.1. - Sensor calibration

Deviations in the temperature values displayed, for example due to cables which are too long or sensors which are not positioned optimally, can be compensated for manually here. The settings can be made for each individual sensor in steps of 0.5°C.

Offset S1...S6 per settings range : -10°C...+10°C Default : 0°C



Caution

Settings are only necessary in special cases at the time of initial commissioning by the specialist. Incorrect measurement values can lead to unpredictable errors.

7.2. - Commissioning

Starting the commissioning help guides you in the correct order through the basic settings necessary for commissioning, and provides brief descriptions of each parameter in the display.

Pressing the “esc” key takes you back to the previous value so you can look at the selected setting again or adjust it if desired. Pressing the “esc” more than once takes you back to the selection mode, thus cancelling the commissioning help. (see also E.2)



Caution

May only be started by a specialist during commissioning! Observe the explanations for the individual parameters in these instructions, and check whether further settings are necessary for your application.

7.3. - Factory settings

All of the settings that have been made can be reset, thus returning the controller to its delivery state.



Caution

The entire parametrisation, statistics, etc. of the controller will be lost irrevocably. The controller must then be commissioned once again.

Special functions

7.4. - Expansions

This menu can only be selected and used if additional options or expansion modules have been built into the controller. The associated supplementary installation, mounting and operation instructions are then included with the specific expansion.

7.5. - Mixer



Caution

Settings are only necessary at the time of initial commissioning by the specialist. Incorrect measurement values can lead to severe unpredictable errors.

7.5.1. - Turn time

The mixer is switched on i.e. is opening or closing for the time span set here, then the temperature is measured to control the flow temperature.

Settings range: 0.5 sec to 3 sec. / Default: 2 sec.

7.5.2. - Pause-Factor

The calculated pause time of the mixer is multiplied with the value set here. If the pause factor is “1”, the normal pause time is used, “0.5” will use half the normal pause time, “4” would quadruple the pause time.

Settings range: 0.1 to 4.0 / Default: 1.0

7.5.3. - Increase

If the temperature rises very fast, this value is added to the measured flow temperature so that the mixer's reaction is stronger.

If the measured temperature does not rise any more, the measured value is used again. The measurement occurs once every minute.

Settings range: 0 to 20 / Default: 8

Menu lock

8. - Menu lock



Menu “8. Menu lock” can be used to secure the controller against unintentional changing and compromise of basic functions.

The menu is closed by pressing “esc” or selecting “Exit menu lock”.

The menus listed below remain completely accessible despite the menu lock being activated, and can be used to make adjustments if necessary:

1. Measurement values
2. Statistics
3. Times
8. Menu lock
9. Service values

To block the other menus, select “Menu lock on”.

To enable the menus again, select “Menu lock off”.

Setting range: on, off / default setting: off

Service values

9. - Service values

9.1. HCC6 2010/09/06.7665

9.2.Outdoor 8°C

9.3.Flow 35°C

▲

▼



Menu “9. Service values” can be used for remote diagnosis by a specialist or the manufacturer in the event of an error, etc.



Caution

Enter the values at the time when the error occurs into the table.

The menu can be closed at any time by pressing “esc”.

9.1		9.31		9.61	
9.2		9.32		9.62	
9.3		9.33		9.63	
9.4		9.34		9.64	
9.5		9.35		9.65	
9.6		9.36		9.66	
9.7		9.37		9.67	
9.8		9.38		9.68	
9.9		9.39		9.69	
9.10		9.40		9.70	
9.11		9.41		9.71	
9.12		9.42		9.72	
9.13		9.43		9.73	
9.14		9.44		9.74	
9.15		9.45		9.75	
9.16		9.46		9.76	
9.17		9.47		9.77	
9.18		9.48		9.78	
9.19		9.49		9.79	
9.20		9.50		9.80	
9.21		9.51		9.81	
9.22		9.52		9.82	
9.23		9.53		9.83	
9.24		9.54		9.84	
9.25		9.55		9.85	
9.26		9.56		9.86	
9.27		9.57		9.87	
9.28		9.58		9.88	
9.29		9.59		9.89	
9.30		9.60		9.90	

Language

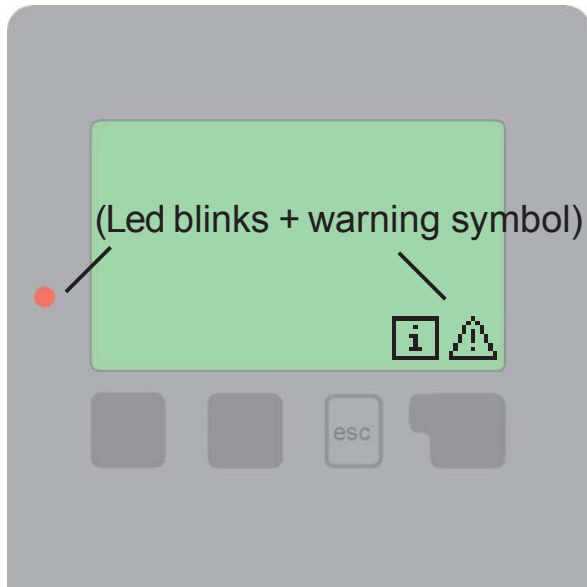
10. - Language



Menu “10. Language” can be used to select the language for the menu guidance. This is queried automatically during initial commissioning. The choice of languages may differ, however, depending on the device design. Language selection is not available in every device design!

Malfunctions

Z.1. Malfunctions with error messages



If the controller detects a malfunction, the red light flashes and the warning symbol also appears in the display.

If the error is no longer present, the warning symbol changes to an info symbol and the red light no longer flashes. To obtain more detailed information on the error, press the key under the warning or info symbol.



Do not try to deal with this yourself. Consult a specialist in the event of an error!

Possible error/information messages:

Sensor x defective----->

Notes for the specialist:

Means that either the sensor, the sensor input at the controller or the connecting cable is/was defective.
(Resistance table on page 5)

Restart----->
(Information only)

Means that the controller was restarted, for example due to a power failure. Check the date&time!

Malfunctions

Z.2. Replacing the fuse

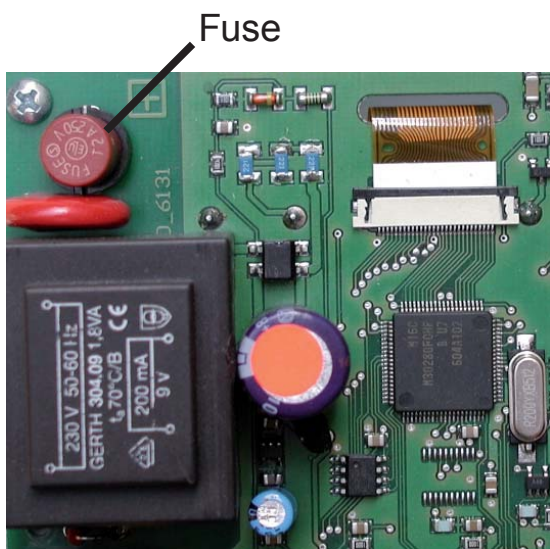


Repairs and maintenance may only be performed by a specialist.
Before working on the unit, switch off the power supply and secure it against being switched on again! Check for the absence of power!



Only use the supplied spare fuse or a fuse of the same design with the following specifications: T2A 250V

Fig. Z.2.1



If the mains voltage is switched on and the controller still does not function or display anything, then the internal device fuse may be defective. In that case, open the device as described under C.1, remove the old fuse and check it. Exchange the defective fuse for a new one, locate the external source of the error (e.g. pump) and exchange it. Then first recommission the controller and check the function of the switch outputs in manual mode as described under E.3.

Z.3. Maintenance



In the course of the general annual maintenance of your heating system you should also have the functions of the controller checked by a specialist and have the settings optimised if necessary.

Performing maintenance:

- Check the date and time (see 3.1)
- Assess/check plausibility of statistics (see 2.)
- Check the error memory (see 2.6)
- Verify/check plausibility of the current measurement values (see 1.)
- Check the switch outputs/consumers in manual mode (see 4.3)
- Poss. optimise the parameter settings

Useful notes / Tips and Tricks



The service values (see 10.) include not only current measurement values and operating states, but also all of the settings for the controller. Write the service values down just once after commissioning has been successfully completed.



In the event of uncertainty as to the control response or malfunctions the service values are a proven and successful method for remote diagnosis. Write the service values down (see 10.) at the time that the suspected malfunction occurs. Send the service value table by fax or e-mail with a brief description of the error to the specialist



To protect against loss of data, record any statistics and data that are particularly important to you (see 2.) at regular intervals.

Hydraulic variant set:

Commissioned on:

Commissioned by:

Final declaration:

Although these instructions have been created with the greatest possible care, the possibility of incorrect or incomplete information cannot be excluded. Subject as a basic principle to errors and technical changes.

Manufacturer:

SOREL GmbH Mikroelektronik

Jahnstr. 36

D - 45549 Sprockhövel

Tel. +49 (0)2339 6024

Fax +49 (0)2339 6025

www.sorel.de info@sorel.de

Your specialist dealer: