Regulus

www.regulus.eu

TRS 3

Installation and Operation Manual
TRS 3 Controller

EN

CE

TRS 3

EC Declaration of Conformity

By affixing the CE mark to the unit the manufacturer declares that the **TRS3** conforms to the following relevant safety regulations:

- Directive 2006/95/EC - EC low voltage directive
- Directive 2004/108/EC - EC electromagnetic compatibility directive

General instructions - please do read!

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.
Installation shall be done according to valid standards and rules. The controller does not under any circumstances replace any safety devices to be provided by the customer (e.g. a safety valve, air vent valve etc.)!
The installation shall be done by a qualified specialist who is trained accordingly.

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.

Changes to the unit

Danger

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

- Changes, additions to or conversion of the unit are not permitted without written permission from the manufacturer.
- It is forbidden to install additional components that have not been tested together with the unit.
- The controller must not be used after an accident when its functions could have been altered - e.g. after a fire. It must be turned off immediately.
- Use only original spare parts.
- Marking of the manufacturer and distributor must not be altered or removed.
- Only the settings actually described in these instructions may be made on the controller.

CONTENTS

A - DESCRIPTION AND INSTALLATION

A 1 - Specification

Electric specification:

Mains voltage	230 V ~ ±10%
Mains frequency	50-60Hz
Power consumption	cca 2 VA
Total switched power	460 VA
Switched power - mechanical relay	460 VA for AC1 / 185W for AC3
Internal fuse	2 A slow-blow, 250 V
El. protection	IP40
Protection class	II
Sensor inputs	3× Pt1000 1× remote controller
Measuring range	-40 to 300 °C

Permissible ambient conditions:

Ambient temperature

- for controller operation	0-40 °C
- for transport/storage	0-60 °C

Air humidity

- for controller operation	max. 85% rel. humidity at 25 °C
- for transport/storage	no moisture condensation permitted

Other specifications and dimensions:

Housing design	2-part, ABS plastic
Installation method	wall installation
Overall dimensions	163 × 110 × 52 mm
Aperture installation dimensions	157 × 106 × 31 mm
Display	fully graphical display, 128 × 64 dots
Operation	4 entry keys

Optional temperature sensors:

Immersion sensor	Pt1000, with lead TT/P4 up to 95 °C
Pipe-mounted sensor	Pt1000, pipe-mounted TR/P4 up to 95 °C
Outdoor temperature sensor	Pt1000, type TA52
Remote controller	Pt1000, type RC21
Sensor leads	2× 0,75 mm^2 extendable up to 30 m

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

A 2 - About the controller

The weather controlled Heating Controller TRS 3 facilitates efficient use and function control of your heating system. This type is designed to control **one mixed heating circuit**. It is equipped with 3 outputs for e.g. one pump and one mixing valve. The TRS3 has 3 inputs for heat sensors and a remote controller. 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.

- both graphics and texts on a backlit display
- simple viewing of the current measurement values
- analysis and monitoring of the system also by means of statistical graphics
- extensive menus with interactive explanations
- menu lock can be activated to prevent unintentional setting changes
- usual preset parameters in factory setting

A 3 - Scope of supply

- TRS3 heating controller
- 3 screws 3.5 × 35 mm and 3 plugs 6mm for wall installation
- 6 strain relief clips with 12 screws
- Replacement fuse 2A slow-blow, 250 V
- Installation, wiring and operating instructions
- 1× pipe-mounted sensor of Pt1000 type, TR/P4 up to 95 °C
- 1× outdoor sensor Pt1000, type TA52

A 4 - Explanation of symbols

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

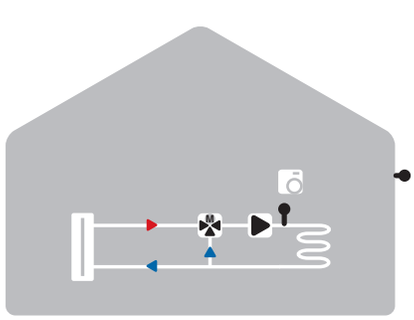
Failure to observe these instructions can result in serious damage to health such as scalding, or even life-threatening injuries.

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

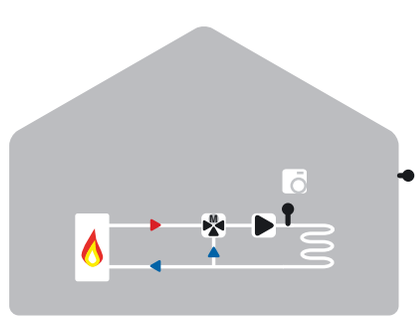
Information which is especially importation for the function and optimal use of the unit and the system.

B - HYDRAULIC VARIANTS

The following illustrations should be viewed only as schematic diagrams showing the respective hydraulic systems, do not claim to be complete. The controller does not replace safety device 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.



Mixed heating circuit



Mixed heating circuit with heat request

C - INSTALLATION AND WIRING

C 1 - Wall installation

Install the controller in dry areas only.

Installation instructions:

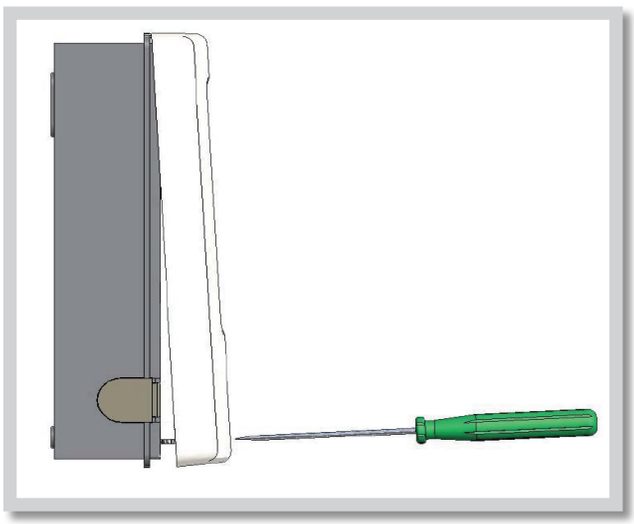


Fig. C 1.1

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.

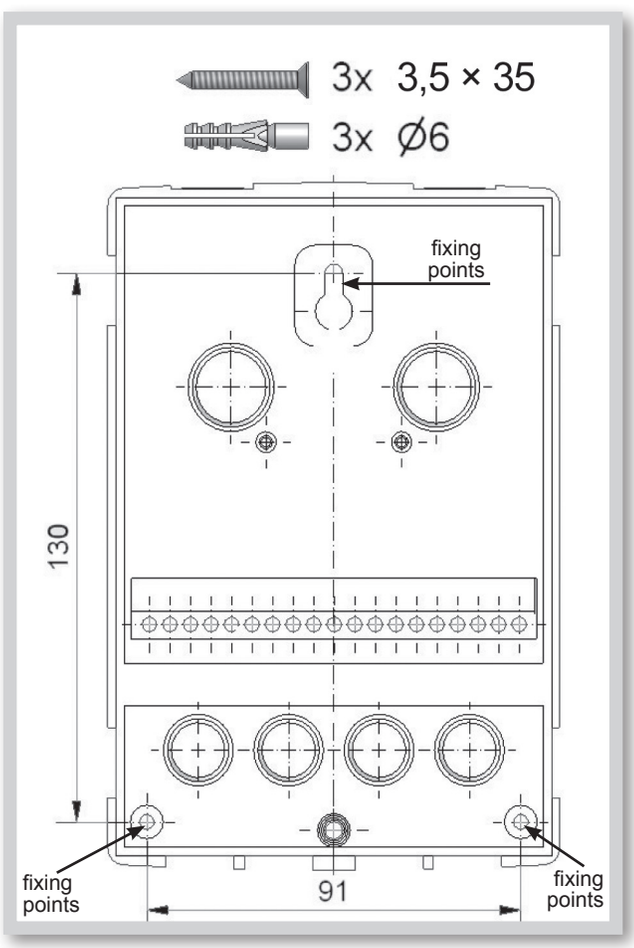


Fig. C 1.2

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.

C 2 - Electric wiring

Danger

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.

Danger

The controller is not equipped with a mains switch. For this purpose please use e.g. a circuit breaker. The cables being connected to the unit must not be stripped by more than 55 mm, and the cable jacket must reach into the housing just to the other side of the strain relief.

Wiring instructions:

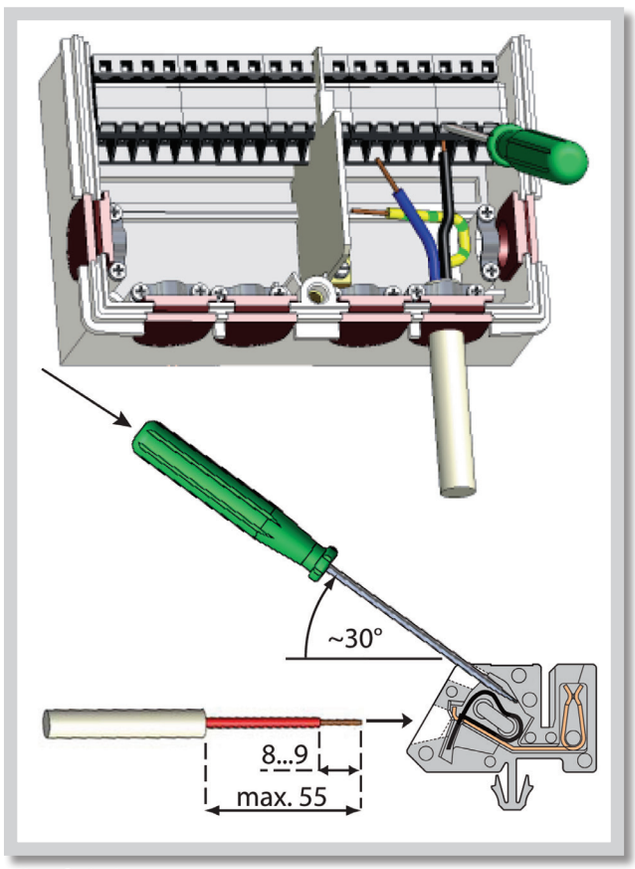


Fig. C 2.1

1. Make sure the circuit breaker is in off position and power supply is off.

2. Open the controller.

3. Strip the cable by 55 mm max., insert and fit the cable strain relief. Strip the last 8-9 mm of all the wires (C.2.1).

4. Press the terminals e.g. with a screwdriver (Fig. C.2.1.d) and wire the cables following the diagrams in Part B (Page 5).

5. Lock the housing lid onto the top margin of its bottom counterpart, push the cables inside and close the housing gently.

6. Secure with a screw.

7. Switch on mains voltage and place controller in operation.

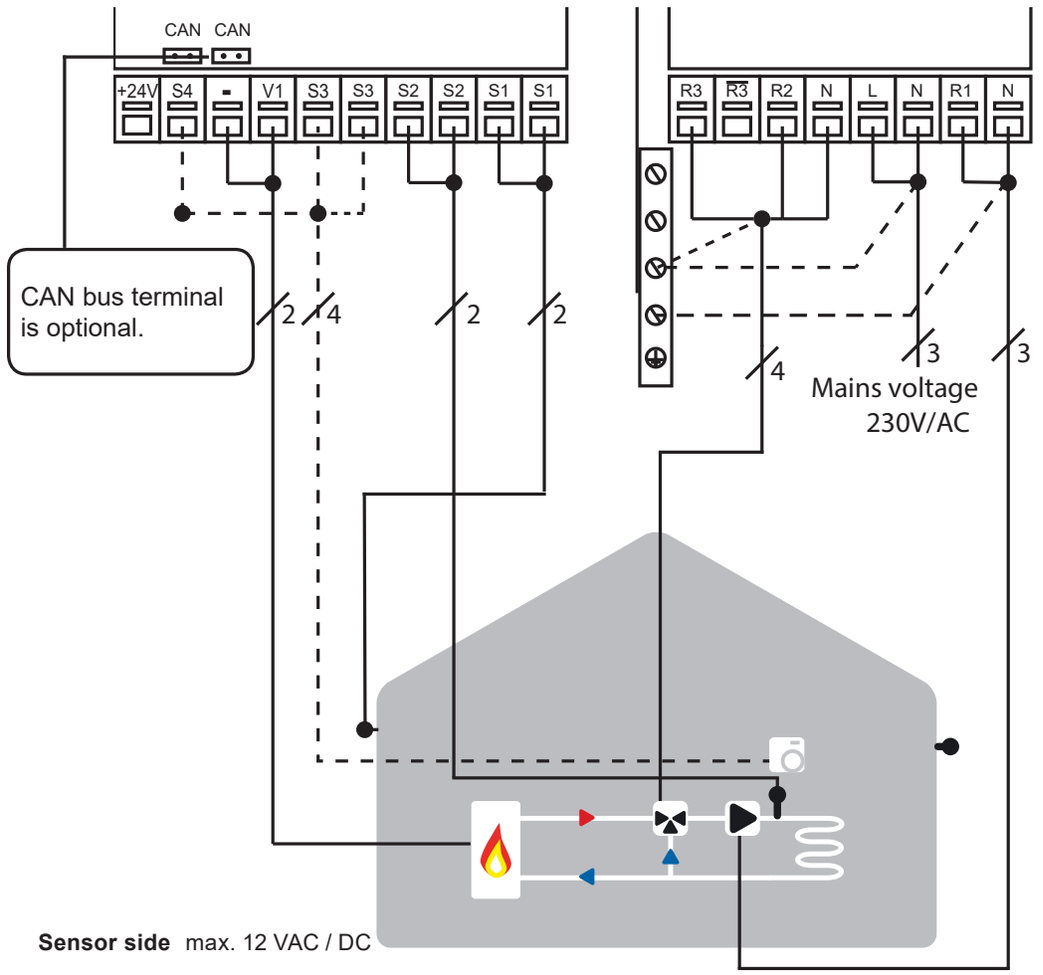
C 3 - Installing the temperature sensors

Caution

The controller operates with Pt1000 temperature sensors.
Max. sensor lead length is 30 m and its cross section at least 0.75 mm^2.
Make sure that there is no contact resistance! Use immersion or pipe-mounted sensors. The temperature sensor cables must be routed separately from mains voltage cables!

D - ELECTRIC WIRING OF SEPARATE HYDRAULIC VARIANTS

D.1 Electrical terminals



Danger

Sensor side max. 12 VAC / DC

Terminal:	connection for:
S1	sensor 1 outdoor sensor
S1	sensor 1 outdoor sensor
S2	sensor 2 heating water
S2	sensor 2 heating water
S3	sensor room temperature
S3	sensor ground (GND-RC21)
V1	0-10V output; heat request An additional relay box is needed for heat requests by switching contacts.
-	earth
S4	remote controller (RC21)
+24V	24V DC power supply for external devices (e.g. a °Caleon Room Unit), max. load 2 W
CAN	x

Danger

Mains side 230 VAC 50 - 60 Hz

Terminal:	connection for:
N	pump - conductor N
R1	pump - conductor L
N	mains - conductor N
L	mains - conductor L
N	mixing valve - conductor N
R2	mixing valve - opens
$\overline{R3}$	not used - 230V
R3	mixing valve - closes

The PE protective conductor shall be wired to the PE metal terminal block!

D.2. RC 21 Remote Controller with thermostat

Caution

RC 21 Remote controller is an optional accessory to the Controller, not supplied with the Controller as standard. The Controller is fully operational without the RC21.

The room un it permits comfortable adjustment of heating from within your living space. The front side accommodates a sliding mode switch and a dial to control the parallel shift of a weather compensated heating curve. Inside there is a temperature sensor.
The dial is used for parallel shift of a heating curve. The flow temperature is raised or lowered respectively by your adjustment. When the dial is turned all the way down, the heating circuit is switched off. Frost protection stays active to prevent damage.

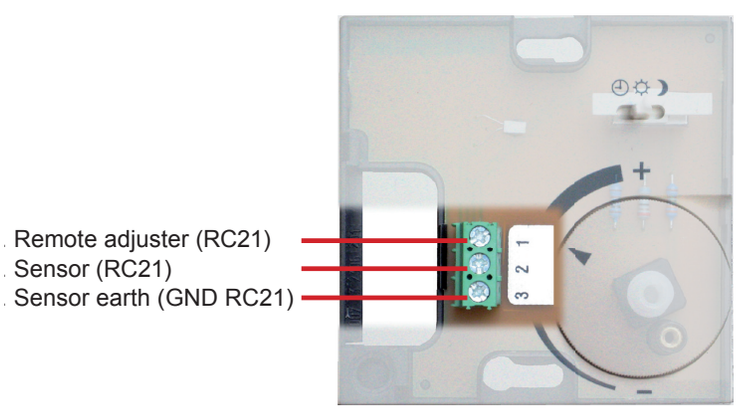
Sensor
The RC21 contains a temperature sensor which is used by the controller.
If the settings in the controller allow it, the sensor is used to modify the flow temperature.

The switch changes the operation mode of the controller.

In Auto - Timer mode the temperature is controlled according to the set thermostat periods.

In Continuous day mode the set periods are ignored and the temperature is controlled according to the Day time settings.

In Continuous night mode the temperature is usually set to lowest. This setting is best suited for periods of long absence like e.g. holidays.



Installation
Carefully remove the dial from the casing with a screwdriver. Loosen the screw beneath. Remove the bright part of the casing from the black socket.
The RC21 is connected via terminal block to the controller.

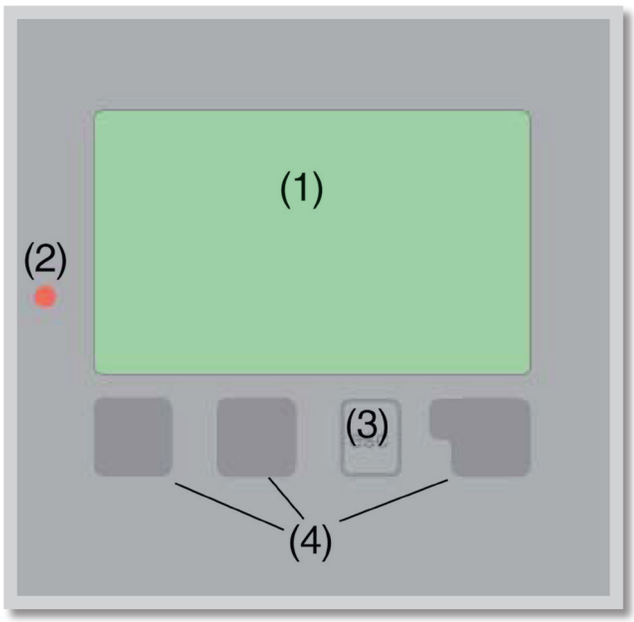
The RC21 is suited for low voltage only!

Clamp connections:
1. Remote adjuster
2. Sensor
3. Sensor earth

E - CONTROLLER USE

E 1 - Display and input

The display ***(1)*** shows graphic and text info on the hydraulic variant, set and measured values and other text info.



The LED lamp (2):

lights up green - if a relay is closed and the controller works right

lights up red - if the controller is set to automatic operation and all relays are open

flashes slowly red - if manual operation mode is set

flashes quickly red - if an error occurred

Examples of display symbols:

pump (rotates when active)

valve (direction of flow is black)

heating - day mode

heating - night mode

heating - comfort mode

day mode

night mode

day mode by RC21

night mode by RC21

heat request ON/OFF

heat request incoming from CAN-Bus

heat requested over CAN-Bus

reference value mode

reference value mode

thermostat

warning / error message

new information available

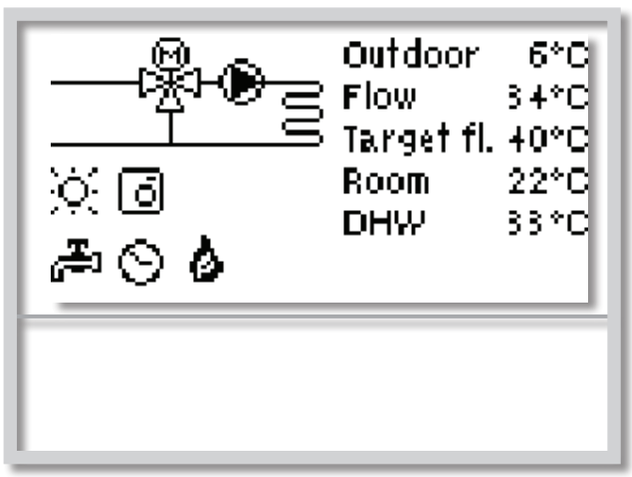
Entries are made using four keys.
In the picture there is an ***„esc“*** key ***(3***) and 3 other keys ***(4)***. The „esc” key ***(3)*** is used to cancel an entry or to exit a menu. If applicable there will be a request for confirmation as to whether the changes which have been made should be saved.

The function of each of the other three keys ***(4)*** is shown in the display line directly above the keys; the right-hand key generally has a confirmation and selection function.

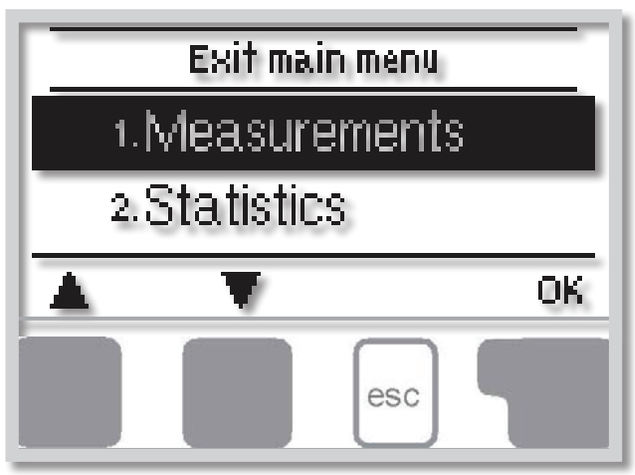
Examples of key functions:

+/-	increase/decrease values
▲▼	scroll menu up/down
YES/NO	confirm/reject
Info	additional information
Back	to previous screen
OK	confirm setting

E 2 - 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 any key ***(4)*** in graphics or overview mode takes you directly to the main menu.

The following menu items are then available for selection there:

E 3 - Commissioning help - setup wizard

The first time the controller is turned on, language and clock need to be set.

After that a query appears as to whether you want to parameterize 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.

E 4 - Free commissioning

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

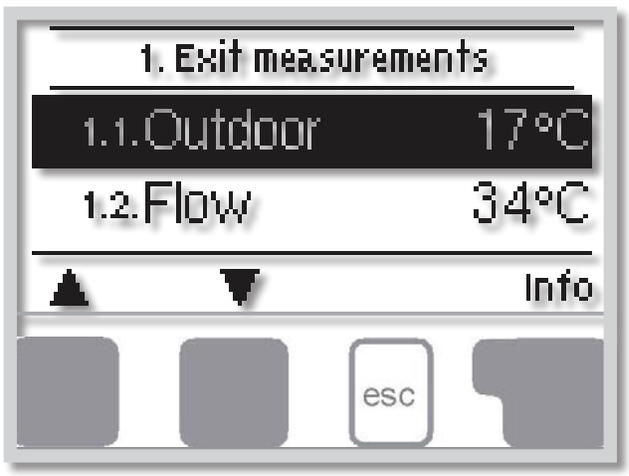
- **Menu 10** Language (see 10)
- **Menu 3** Time, date and operating times (see 3)
- **Menu 5** Selection of Settings HC (see 5)
- **Menu 6** Protective functions if necessary (see 6)
- **Menu 7** Special functions if necessary (see 7)

Note!
Setup wizard is available in **Menu 7.2**
Observe the explanations for the individual parameters on the following pages, and check whether further settings are necessary for your application.

Finally, menu 4.2 under operating mode ***"Manual"*** should be used to test the switch outputs with the heat consumers connected, and to check the sensor values for plausibility. Then set to automatic mode.

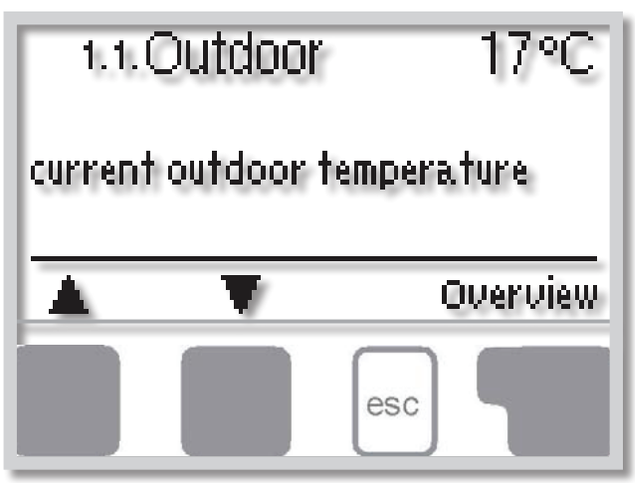
F - MENU DESCRIPTION

1 - Measurements



Menu **„1. Measurements"** serves to display the currently measured temperatures.

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



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

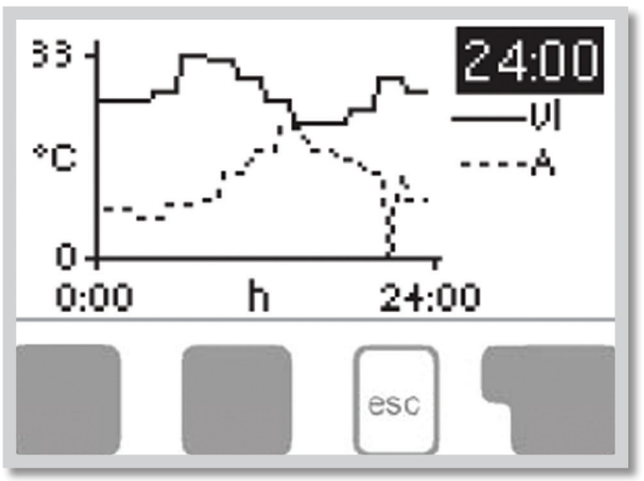
Caution

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

Caution

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 using the function of sensor compensation - see 7.1.

2 - Statistics



Menu **„2. Statistics"** is used for function control and long-term monitoring of the system.

The submenus described under 2.1-2.5 are available.

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 it 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 heating circuit

Display of operating hours of the heating circuit in Winter mode.

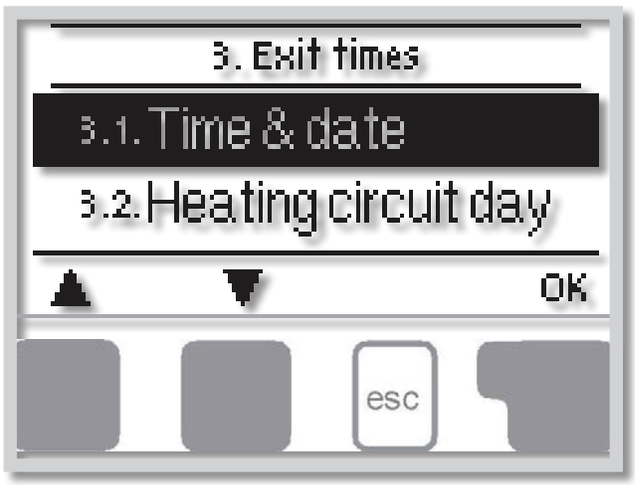
2.4 - Operating hours DHW

Display of operating hours of the DHW connected to the controller, and the date the measurement started.

2.5 - Operating hours additional heating

Display of operating hours of the additional heating connected to the controller, and the date the measurement started.

3 - Times



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

Caution

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

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.

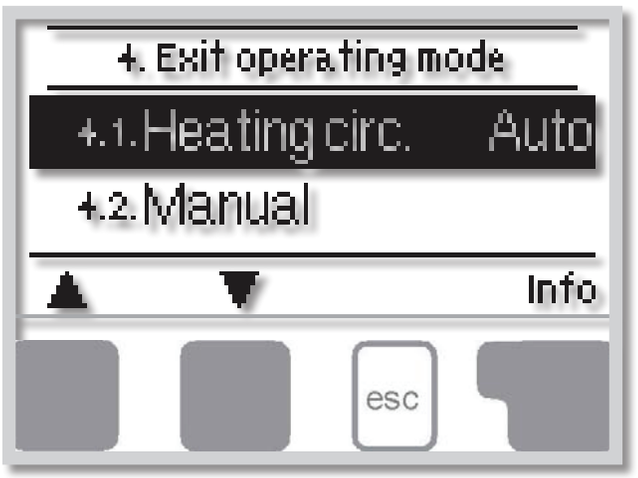
Caution

*Times that are not specified are automatically considered to be nighttime mode. The set times are only taken into account in the heating circuit operating mode **„Automatic”**.*

3.3 - 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.

4 - Operating mode



Menu **„4. Operating mode"** 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 mode"***.

Danger

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 4.3.
14 day reference value = Specific fixed flow temperatures can be set for the next 14 days in menu 4.4. 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)

4.2 - Manual

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

Danger

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

Function in 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. At the same time, the current measurement values of temperature sensors are also shown in the display for the purposes of function control.

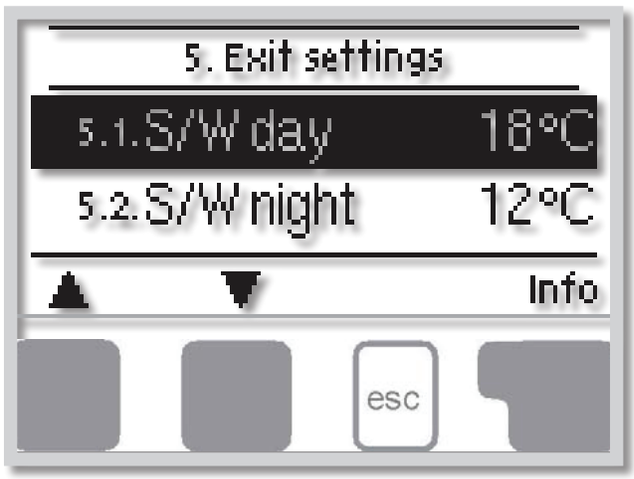
4.3 - Heating circuit reference

If operating mode ***„Reference value"*** is selected, (Menu 4.1), the reference flow temperature has to be set here, regardless of the curve or outdoor temperature.

4.4 - 14 day reference

If operating mode ***„14 day reference value"*** is selected (Menu 4.1), the reference flow temperature for each of the 14 days can be set here.
In the menu 4.4.1 the starting time of the program is shown. To start the program, press restart.
Pressing ***„restart"*** again will reset the 14 day reference program and start it at day 1.

5 - Settings HC



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

Danger

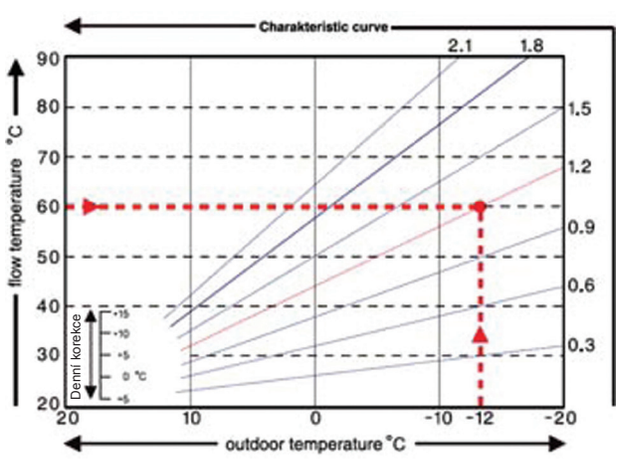
In no case may the Controller replace a safety device installed in a hydraulic circuit!

5.1 - S/W Day = Summer/Winter changeover in daytime mode
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.

5.2 - S/W Night = Summer/Winter changeover in nighttime mode
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.

5.3 - Curve = Slope of the weather compensated heating curve
The demand for heat is different due to differences in the type of building/insulation/type of heating/outdoor temperature. The characteristic curve is used to control the heat dissipation of the heating circuit relative to the outdoor temperature. The controller can make use of a normal straight curve (Setting simple) or a split curve (Setting split) that is divided into 2 parts by a split point. The straight curve can be set easily using one parameter. The characteristic curve for the split mode is adjusted in 3 steps.
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.
Setting the split curve is more precise but more complicated. 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.

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..

The following settings (5.4 – 5.6) can be used for parallel shift of the characteristic for certain time periods – day, night or comfort temperature.

5.4 - Day correction = parallel shift of the curve

The day correction means a parallel shift of the heating curve 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 optimized, the following situation may occur:

in hot weather - the rooms are too cold
in cold weather - the rooms 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.

5.5 - Night correction = parallel shift of the curve

The night correction produces a parallel shift of the weather compensated heating curve 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, energy can be saved

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

5.6 - Comfort temperature boost = parallel shift of the 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.

5.8 - Min. Flow

The minimum flow temperature is the lower limit of the heating curve.

5.9 - Max. Flow

If the temperature exceeds this value, the heating circuit is switched off until the temperature drops below again.

For safe operation, a safety thermostat shall be wired in series to a pump.

5.10. Heat Request

This function requests a burner after 1 minute if the flow temperature stays below the target flow temperature minus the Reference/Actual value (see 5.12) for this time period. If the target flow temperature is reached, the heat request is immediately switched off again.
Off: Heat request is deactivated
Switching: Switch exit V1 at heat request to 10 V
Modulating: The desired temperature controls the signal voltage at V1 (V1 = desired temperature/10).
CAN bus: The desired flow temperature is sent via CAN bus by the controller when heat request is received.
Conditions:
1. Controllers shall be mutually interconnected by a CAN connection cable (page 27).
2. Only one controller requests the heat source directly, either modulating or by switching contact. This controller has to be connected to the requested heat source by V1 or by V1 with additional relay (Section 5.10).
3. For all other controllers, CAN bus shall be selected in Section 5.10. If one or more controllers request a heat source according to the conditions described above, this request is transmitted via CAN bus together with the required flow set temperature. The controller connected to the heat source passes this requirement promptly to the heat source. If more than one controller sends a heat request via CAN bus, the request with the highest required flow set temperature has priority.

5.11. Energy Saving Mode

The Energy saving mode switches the heating on when T eco is undershot und heats up to Teco + hysteresis when solar charge or solid fuel boiler is active.

5.13. Reference/Actual

Switch on hysteresis for additional heating
This setting determines the allowed undershoot of the heating circuit temperature below the flow temperature calculated from the heating curve. If the HC flow temperature and the storage temperature drop below the desired flow temperature by hysteresis, the additional heat source will start after a 1 minute delay.

5.14. Threshold

When Energy saving mode is active, this value is used instead of TH set. When the temperature drops below T eco at thermostat sensor S1, the boiler relay is switched on that switches off at the value of Threshold + hysteresis.

5.15. Mod. Offset
At modulated heat request the requested temperature can be increased by the value adjusted here.

5.16. 14-day Reference
If operating mode “14-day reference value” is selected (Menu 4.4), the reference flow temperature for each of the 14 days can be set here.
The Menu 4.4.1 shows the starting time of the programme. To start the programme, press “restart”.
Pressing “restart” again will reset the 14-day reference programme and restart it at Day 1.

6 - Protective functions

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

Danger

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

6.1 - Seizing protection
If the anti-seizing protection is activated, the controller switches the pump and the mixer on/off at 12:00 noon for 5 seconds to prevent seizing of the pump/valve after long periods of inactivity.

6.2 - Frost protection
Frost protection function can be activated for the heating circuit. If the outdoor temperature at sensor S1 drops below 1 °C and the heating circuit is switched off, the controller switches it back on with the reference temperature set in menu 6.3 (min. flow temperature). As soon as the outdoor temperature exceeds 1 °C, the heating circuit is switched off again.

Danger

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

6.3 - Min. flow temperature
The minimum flow temperature is the lower limit for the weather compensated curve/slope and as a result of the reference flow temperature of the heating circuit. Additionally, the min. flow temperature is the reference flow temperature for the frost protection.

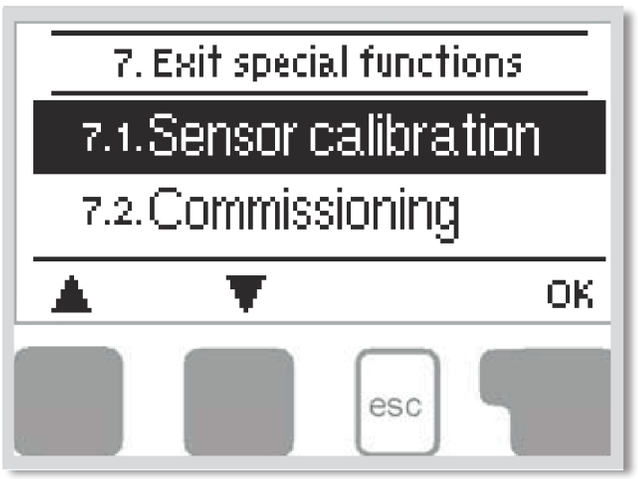
6.4 - Max. flow temperature
This is used as the upper limit for the reference flow temperature of the heating circuit. Should the heating circuit temperature exceed this value, the heating circuit is switched off until the temperature drops below.

Danger

For safety, an additional limiting thermostat must be provided which is connected to the pump in series.

6.5. Discharge Protection
If the required flow temperature is not reached despite the mixing valve being completely open, then this protection is activated that switches off the circulation pump.

7 - Special functions



Menu **„7. Special functions"** is used to set basic items and expanded functions.

Danger

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

7.1 - Sensor calibration

Deviations in the temperature values displayed, for example due to cables which are to 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.

7.2 - Commissioning

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 (see also E 3).

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

7.4 - Mixer

Caution

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

7.4.1 - Turn time

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

7.4.2 - 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. Setting the pause factor to ***4*** would quadruple the pause time.

7.4.3 - Increase

If the temperature rises very fast, this value is added to the measured flow temperature so that the mixer's reaction is faster.
If the measured temperature does not rise any more, the measured value is used again. The measurement occurs once every minute.

7.5 - Room controller

The settings necessary for the optional room controller RC21 are made in this menu. The 3 modes *„continuous day"*, ***„continuous night"*** and ***„Time controlled/automatic"*** can be switched at the RC21. Additionally the reference temperature of the flow can be parallel shifted by turning the control wheel. If the wheel is set to minimum, only the minimum values that can be set in the protective functions menu will be used.

7.5.1 - Room controller - setting
This value is used to appoint the amount of influence (in %) the room temperature has on the reference flow temperature. For every degree of deviation of the room temperature from the reference room temperature the percentage of the calculated reference flow temperature set here is added to or, respectively, subtracted from the reference flow temperature. As long as it is within the limits of the min. and max. flow temperatures that can be set in the protective functions.

Example:
Reference room temp.: e.g. 25 °C;
room temp.: e.g. 20 °C = ±5 °C deviation.

Calculated reference temp.: e.g. 40 °C: room controller: 10 %= 4 °C.
5 × 4 °C= 20 °C. Accordingly, 20 °C are added to the reference flow temperature, giving 60 °C. If the value is higher than the one set in max. flow temp, the resulting temperature is the one set in max. flow temp.

7.5.2 - Room reference day
The desired room temperature for day mode. As long as this temperature is not reached, the reference flow temperature is raised or respectively lowered according to the percent setting in ***“room controller”***. If ***“room controller”*** is set to 0 %, this function is deactivated.

7.5.3 - Room reference night
The desired room temperature for night mode. As long as this temperature is not reached, the reference flow temperature is raised or respectively lowered according to the percent setting in ***“room controller”***. If ***“room controller”*** is set to 0 %, this function is deactivated.

7.5.4 - Thermostat
The room controller is set here. If no RC21 is connected, a room controller from another heating controller over can be selected over the CAN bus. The CAN bus ID of the controller is shown in Menu 6, “Service Data”. Choose the RC21 with the CAN Bus ID of the corresponding controller. The heat controller now obtains the switch position and rotary switch position from the CAN bus.

7.6. Eco Display Mode
When this function is active, the controller’s clock changes automatically to and from DST (Daylight Saving Time).

7.7. Network
The settings of the Ethernet connection of the data logger are set using this menu.

7.7.1. Access Control
In this menu you can add or remove four users who should have access to the data logger. ITo add a user in the list, select <add user>. The list show you the last 5 users that tried to connect to the data logger. Select a user with OK to give it to grant access. To revoke access again choose one of the 4 users from your list and choose <remove user>.

7.7.2. Ethernet
The data logger‘s Ethernet connection settings can be set using this menu.

7.7.2.1. Ethernet
Activate or deactivate the Ethernet function.

7.7.2.2. MAC Adress
Displays the individual MAC address of the data logger.

7.7.2.3. Auto-Configuration (DHCP)
If activated, the data logger requests IP addresses and network parameters from a DHCP server.

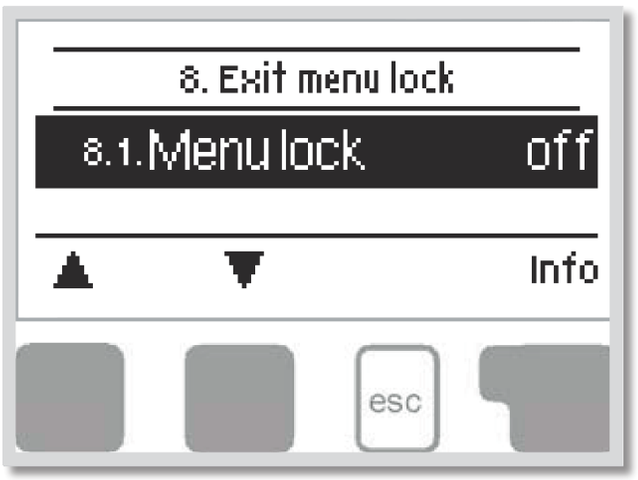
7.7.2.4. IP-Address
The IP address of the data logger can be set in this menu.

7.7.2.5. Subnet
The subnet mask of the data logger can be set in this menu.

7.7.2.6. Gateway
The IP of the gateway for the data logger can be set in this menu.

7.7.2.7. DNS-server
The IP address of the DNS server can be set in this menu.

8 - Menu lock



Menu **„8. Menu lock”** can be used to secure the controller against unintentional changing of the set values.

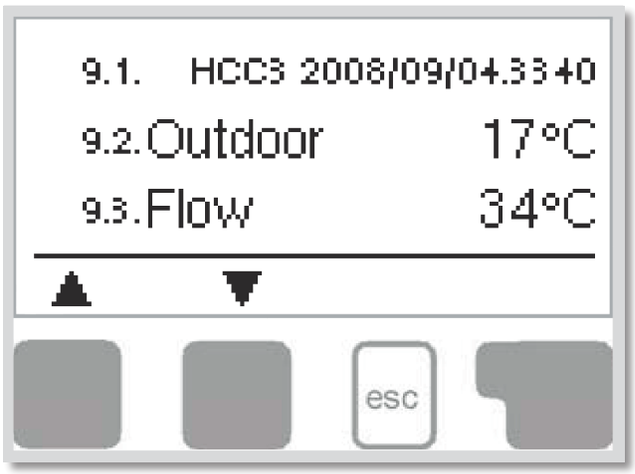
The menu is closed by pressing „esc” or selecting ***„Exit menu lock”***.

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

1. Measurements
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”**.*

9 - Service values



The menu ***„9. Service values"*** can be used for remote diagnosis by a specialist in the event of an error etc.

Caution

The data may be entered e.g. into the following table.

The menu can be closed at any time by pressing ***„esc"***.

9.1.	
9.2.	
9.3.	
9.4.	
9.5.	
9.6.	
9.7.	
9.8.	
9.9.	
9.10.	
9.11.	
9.12.	
9.13.	
9.14.	
9.15.	
9.16.	
9.17.	
9.18.	
9.19.	
9.20.	
9.21.	
9.22.	
9.23.	
9.24.	
9.25.	
9.26.	
9.27.	
9.28.	
9.29.	
9.30.	

9.31.	
9.32.	
9.33.	
9.34.	
9.35.	
9.36.	
9.37.	
9.38.	
9.39.	
9.40.	
9.41.	
9.42.	
9.43.	
9.44.	
9.45.	
9.46.	
9.47.	
9.48.	
9.49.	
9.50.	
9.51.	
9.52.	
9.53.	
9.54.	
9.55.	
9.56.	
9.57.	
9.58.	
9.59.	
9.60.	

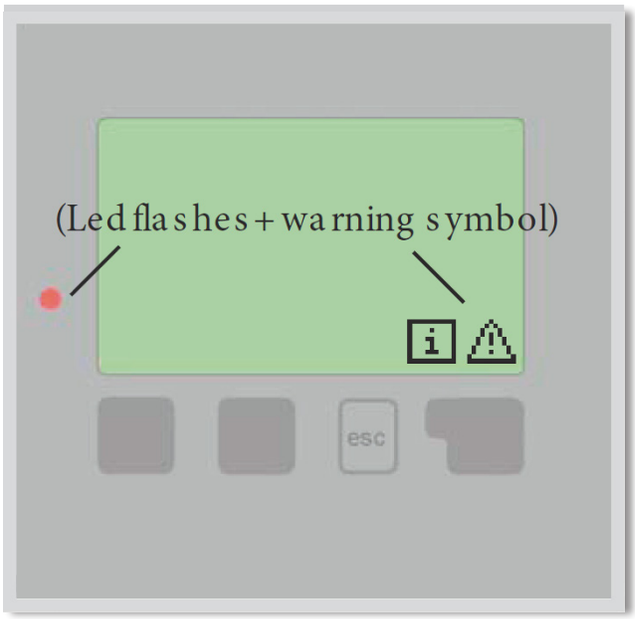
10 - Language

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 (German, English, Czech, French, Italian, Spanish) may differ, however, depending on the device design. Language selection is not available in every device design!

G - Defects and Maintenance

G 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 messages:	**Notes for the specialist:**
Sensor x defective	Means that either the sensor, the sensor input at the controller or the connecting cable is/was defective. (Resistance table see chap. A6)
Restart (Information only)	Means that the controller was restarted, for example due to a power failure. Check the date&time!

G 2 - Replacing the fuse

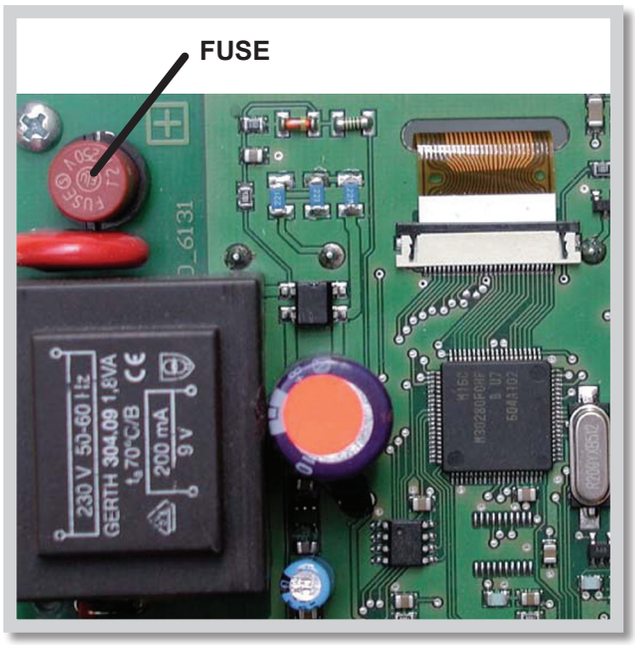


Fig. G 2.1

Caution

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 250

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, 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 4.2.

G 3 - Maintenance

Caution

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 optimized if necessary.

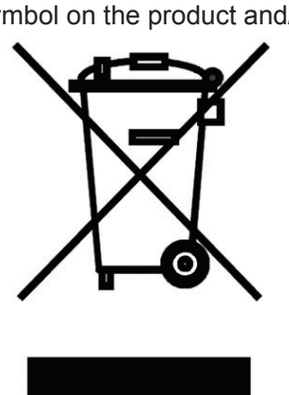
Performing maintenance:

- 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 4.2)
- Possibly optimize the parameter settings

G 4 - Likvidace regulátoru

IMPORTANT INFORMATION ON DISPOSAL IN COMPLIANCE WITH THE EUROPEAN DIRECTIVE 2002/96/EC

European Directive 2002/96/EC requires that the equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product should be disposed of separately from regular household waste streams. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities. Correct disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about the disposal of your old equipment, please contact your local authorities, waste disposal service, or the shop where you purchased the product.



WEEE registration number: 02771/07-ECZ

G 5 - Useful hints and tricks

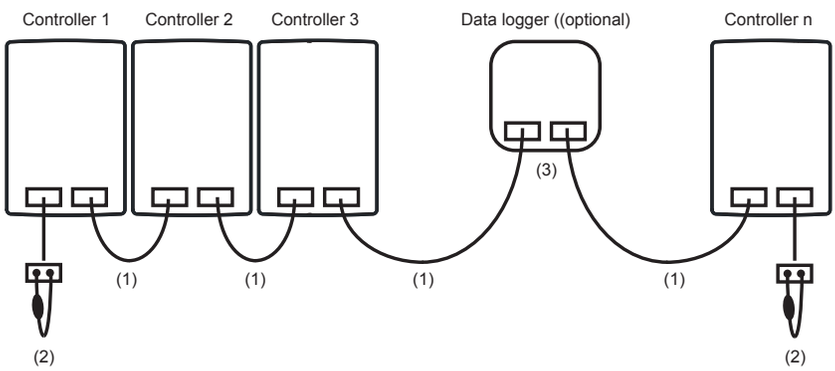
The service values (see 10) include not only current measurement values and operating states, but also all of the settings for the controller. Write the service values down just once after commissioning has been successfully completed.

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 15) 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 analyses and data that are particularly important to you at regular intervals (see 7).

Z 1 CAN-Bus

The CAN bus can be used to connect two or more controllers with each other or with the data logger to exchange data..



1. The controllers are connected in series with the CAN bus cable.
2. The first and last controllers in this connection in series must be fi tted with terminating resistors.

The wiring of the two CAN sockets is arbitrary.

3. Optionally, the data logger (3) can also be connected to the CAN bus. The available CAN functions are subject to the controller type as well as the used software version and can be seen in the corresponding manual.

v2.1M-08/2019

REGULUS spol. s r.o.
E-mail: sales@regulus.eu
Web: www.regulus.eu