

# Operating Instructions

for the operator and authorised end user



## Operating Module BM8

---



# Table of Contents

---

<b>Table of Contents</b>	2
<b>Operation</b>	
Power connection regulations.....	3
Warranty conditions.....	3
Function.....	3
Operation in normal mode.....	4
Operating mode selection.....	4
Effect of the operating mode.....	5
Display in normal operation.....	6
Changing the settings.....	7
Operating level.....	8
Changing the settings.....	9
Overview of display values and settings.....	10
General function description.....	26
Installation and Start-up.....	27

# Operation

## Power connection regulations

## Warranty conditions

## Function

---

### Power connection regulations

Please note the connection conditions specified by your local electrical power supply company and the VDE regulations.

Your heating control system may only be installed and serviced by appropriately authorised specialists.

⚠ If the system is not installed properly, persons using it are at put at risk of fatal or serious injury.

### Warranty conditions

If the system is not installed, commissioned, serviced and repaired properly, it will render the manufacturer's warranty null and void.

### Important text passages

! Important information is highlighted by an exclamation mark.

⚠ This attention symbol indicates dangerous situations.

### Installation

Information on installation of the system is provided in this manual together with a connection diagram.

! The operating manual describes the maximum version of the controller, meaning that not all statements are relevant for your device.

### Declaration of conformity



This device corresponds to the requirements of the relevant guidelines and standards, if the corresponding regulations and the manufacturer's instructions are complied with.

### Function

The operating module allows system parameters (e.g. time, current hot water temperature setting) and heating circuit parameters (e.g. heating times and desired room temperature) for the heating system to be conveniently entered and displayed from the user's living room. This allows the system to be continuously monitored and optimised.





The operating module also allows weather-dependent control to be carried out using a room temperature correcting facility.

# Operation

## Operation in normal mode Operating mode selection

**Operation in normal mode**  
(operating flap closed)

### Operating elements







-  Mode selector switch
-  ECO button  
(suspend heating)
-  Party button  
(extend heating time)
-  Change to room temperature  
setting



### Operating mode selection


The desired operating mode can be selected by pressing this button several times. The selected operating mode is indicated by a symbol in the display. It takes effect when the setting is not changed for 5 s.


The following operating modes are available for selection:

-  **Standby / OFF**  
(heating and hot water preparation  
OFF, frost protection function only)
-  **Automatic mode 1**  
(heating according to timer  
program 1)
-  **Automatic mode 2**  
(heating according to timer  
program 2)
-  **Day mode**  
(24 hr heating with comfort  
temperature 1)
-  **Night mode**  
(24 hr heating with reduced  
temperature)
-  **Summer mode**  
(heating OFF, hot water prepara-  
tion only)

# Operation




## Effect of the operating mode


 **ECO button (suspend heating)**




Display (for approx. 3 sec.) the heating suspend time  
=> heat at "Absent" temperature [D]

### Set heating suspend time using Settings/Start Display / Set Heating Suspend Time




-  press => + 1 hour per press
-  press => - 1 hour per press
-  press for 3 sec.:  
The heating circuit switches to reduced mode until the first heating cycle of the following day. Display briefly switches to "ECO"

 **Party button (extend heating time)**



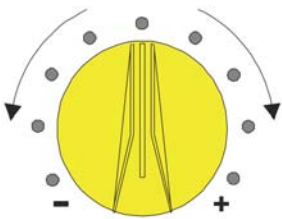
Display (for approx. 3 sec.) the heating extend time  
=> Heat at "Comfort" temperature [☀]

### Set heating extend time using Settings/Start Display / Set Heating Extend Time

-  press => + 1 hour per press
-  press => - 1 hour per press
-  press for 3 sec.:  
The heating circuit switches to heating mode until the first heating period of the following day. Display briefly switches to "PARTY"

Stop party or ECO function by pressing the mode selector switch ►

**Changes to set room temperature**



In the normal position the room temperature setting is used during heating operation (default: 20°C).

The desired room temperature can be adjusted by  $\pm 5^\circ\text{C}$  using the rotary knob. The night temperature (reduced temperature) that is set at the controller is not affected.

- Rotate to right  
=> warmer ( $\sim 1^\circ\text{C}$  per dot)
- Rotate to the left  
=> cooler ( $\sim 1^\circ\text{C}$  per dot)

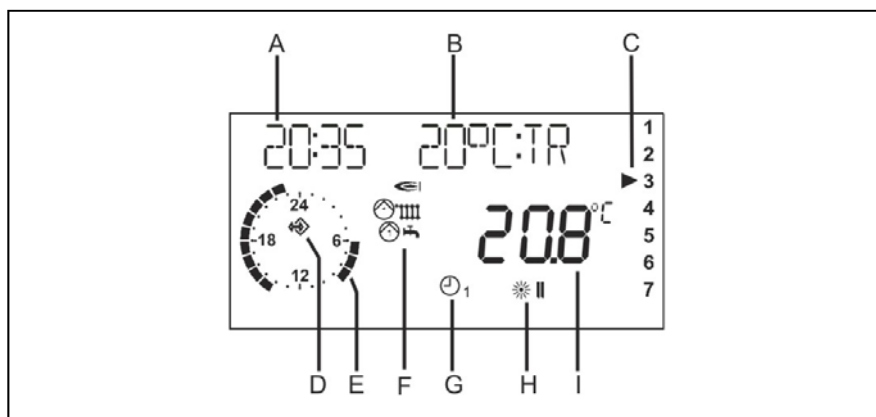
# Operation

## Display in normal operation

### Display in normal operation

#### Explanations

- A Current time
- B required room temperature (shown in degrees Celsius) without decimal digits (see page 14)
- C Weekday (1=Monday, 2=Tuesday, ..., 7=Saturday) (in this case 3 = Wednesday)
- D Bus symbol (check data lead to boiler if this symbol does not appear)
- E Display of active heating program (in this case: 6:00 to 09.00 hrs. and 14.00 to 23.00 hrs.)
- F Status display:
  - ⇒ Burner ON;
  - ⏏ Heating requirement (e.g. hot water preparation);
  - ⏏ Heating requirement and heating pump on;
  - ⏏ Hot water preparation requirement (e.g. charging pump inhibit);
  - ⏏ HW charging pump on,
  - ⏏ Collector pump on
- G Mode selector switch (in this case ① 1 ⇒ Heating according to timer program 1)
- H Operating display and current status (in this case: ⚡ II ⇒ Heating with room temperature setting 2)
- I Current room temperature display



! Because the room temperature only changes slowly, differences of +/- 1°C from the desired room temperature are normal. Greater differences temporarily occur during the transition from reduced mode to heating mode.

# Operation

## Changing the settings

### Changing the settings

🗨 Programming button

- a) Select value level
- b) Select a value to adjust
- c) Save a new value



Plus button  
(search for or adjust value)



Minus button  
(search for or adjust value)



Opening the operating cover puts you directly into operating or adjustment mode.  
=> ANNOUNCE  
=> INSTALLATION



Use the plus/minus buttons to select the level containing the value to be adjusted  
=> Overview on the following pages



Press Prog button!  
=> Open / select level



Find value using plus/minus buttons  
=> Overview on the following pages



Press Prog button!  
=> Select value  
Warning triangle appears in display  
=> Adjustment can now take place



Modify value using plus/minus buttons

**either**

**=> do not save value**



Close operating cover  
=> ⚠ Caution! Value has not been saved

**or**

**=> save value**



Press Prog button!  
=> Save value  
Warning triangle appears in display and then



Close operating cover

# Operation

## Operating level


### Operating level


**Operation is divided into different areas:**


General - Display - Users - Time Programs - Expert


Opening the hinged control panel cover automatically takes you to the display and indicator area.


- The current area "DISPLAY" appears in the display for a short time (1 clock circuit).
- After the clock circuit the display switches to the current operating level "INSTALLATION".
- This is displayed for a short time (1 clock circuit) when you switch to a new area.


 Use +/- buttons to select level containing the value to be adjusted and displayed





 Press Prog button!  
=> Open / select level

 Search for value using the +/- buttons

 Press Prog button!  
=> Select value  
LED lights up  
=> adjustment can now be made

 Modify value using the +/- buttons

 Press Prog button! => Store value - LED goes off

	General information	SERVICE
		DATE/TIME/HOLIDAY
Open operating flap	 Press	
	 Press	
	Display	INSTALLATION
		HOT WATER
		HEATCIRCUIT
	User	INSTALLATION
		HOT WATER
		HEATCIRCUIT
	Time programs	HOT WATER
		HTG-PROG 1
		HTG-PROG 2
	Expert	INSTALLATION
		HEATCIRCUIT



## Changing the settings

---

### Changing the settings

#### Areas

##### General

Value selection summary

Service => for service engineers

Date/Time/Holiday => for users

##### Display

System value display (e.g. sensor values and setpoints). No adjustments can be made. Operating errors are therefore excluded in this area.

##### Users

Summary of settings that can be made by the operator.

##### Time programs

Summary of time programs for heating circuits, the hot water circuit and possibly the circulation pump

##### Expert

Summary of values for which expert knowledge is required to make settings (installation technician).

⚠ Making incorrect settings in the expert level can cause damage to the system or the property that is being heated. => The values in the expert level are protected by a code number.

#### Levels

The settings in the different areas are sorted into operating levels

- INSTALLATION
- HOT WATER
- HEATCIRCUIT

##### INSTALLATION

All display values and settings that relate to the heat generator or the entire system and cannot be assigned to a consumer circuit.

##### Hot water

All display values and settings that affect central hot water preparation and circulation.

##### Heating circuit

All display values and settings that relate to the associated consumer circuit.

When heat circuit II is being configured as a hot water circuit, for example, the settings for this distributed hot water circuit can be found in the "Heat circuit II" operating level.

! An overview of all settings can be found on the following pages.

# Operation

## Overview of display values and settings

### Overview of display values and settings

#### General area

(Select main level using ▲▼ and open with ↵)

#### Date/Time/Holiday

This area contains a series of different values in order to provide rapid access.

(Select values/value group using ▲▼ and open with ↵)

! If a heating system controller has been set to be the TIME MASTER (time setting for all controllers, see EXPERT/INSTALLATION) or a DCF (Radio time receiver) has been installed in the system, the time is blanked out on all the other controllers in the system.

! There may be a time difference of up to 2 minutes per month (correct time if necessary). If a DCF receiver is connected the correct time is always displayed.

! Please do not enter the day of travel as the start date, but the first day of the holiday (no more heating from this day).

! Please do not enter the day of travel as the end date, but the last day on which there is to be no heating. When you arrive home the house should be warm and there should be hot water.

! Stop holiday function => e.g. for early return by pressing the program switch.

#### Date/time => Value group

(General -> Date/Time/Holiday level)

All the values in this group are set in sequence => adjust using ▲▼  
=> continue with ↵

TIME (Minutes)	Current minutes blink and can be adjusted
TIME (Hours)	Current hours blink and can be adjusted (seconds are set to "00" when stored)
YEAR	Adjust current year
MONTH	Adjust current month
DAY	Adjust current day (date)
🔒 Hinged cover OPEN → search for level with ▲▼, open with ↵	

The current weekday is calculated automatically. Checking can take place using the selectable additional display in the standard display => set to "Day"

It is possible to change from summer to winter time by entering the date.

#### Holiday => Value group

(General -> Date/Time/Holiday level)




All the values in this level are set in sequence => adjust using ▲▼  
=> continue with ↵

YEAR START	Set current holiday start year
MONTH START	Set current holiday start month
DAY START	Set current holiday start day
YEAR STOP	Set current holiday end year
MONTH STOP	Set current holiday end month
DAY STOP	Set current holiday end day

# Operation




## Overview of display values and settings

- ! Not with Time Master or DCF
- ! The default setting is valid for Central European time zones. A modification is only required if the date for the time change is changed by political decree.
- ! The earliest date on which the change will occur must be set. The controller performs the time change on the Sunday following this date at 2.00 am or 3.00 am.
- ! If no time change is required, please set MONTH STOP to the same value as MONTH START and DAY STOP to the same value as DAY START.

<b>Summer time</b> => Value group (General -> Date/Time/Holiday level) All the values in this level are set in sequence => adjust using   continue with 	
MONTH START	Set month for start of summer time
DAY START	Set earliest day for start of summer time
MONTH STOP	Set month for start of winter time
DAY STOP	Set earliest day for start of winter time

### Service


This area contains values for the customer service engineers in order to provide rapid access.

(Select operating level using   and open with )


### SW NO XXX-XX

Display software number with index (please specify if you experience problems or have questions about the controller)

### BURNER TIME and BURNER START

 => Display of current value

 => Return




 hold down until
















"RESET" display goes off

=> Reset display

### RESET...

The three value groups can be reset to the factory setting using the Reset function.

Select function using , set to "01" using  and confirm with .

<b>Other entries</b> (General -> Service level) Select value using   => value is displayed	
SW NO XXX-XX	Software number with index
BURNER TIME 1 	 Burner run time for burner 1
BURNER START 1 	 Burner starts for burner 1
BURNER TIME 2 	 Burner run time for burner 2
BURNER START 2 	 Burner starts for burner 2
RESET USER 00	Load user parameter factory settings
RESET EXPERT 00 (only with code no.)	Load expert parameter factory settings
RESET T-PRG 00	Load time program factory settings
RETURN	Exit level using 
 Hinged cover OPEN → search for level with   , open with 	

# Operation

## Overview of display values and settings

### Display Range

! Display only. No adjustments possible.

! Display only appears if the sensor is connected and the value is present in the system.  
If the set value is not present it is masked out, or hyphens appear in the display (- - -).

\*) only with solar-control connected to the bus

#### T-OUTSIDE

The measured outside temperature is smoothed for control purposes. The smoothed value is displayed here.  
By pushing the Prog key you obtain the max. value since midnight. By pushing the Plus/Minus key you can alternate between max. and min. value.

#### RATED BOIL-T

Corresponds to the maximum required temperature of the consumer circuits from the heating system (incl. hot water preparation). The mixer circuits request the temperature + heating curve distance (expert value)

#### T-BOILER

Measured current boiler temperature

#### MODULATION

\*\*) Only for modulated burners

#### T-RELAY 1


(Multifunction sensor temperature at HG )

Function depending on chosen function at the regulator

#### INSTALLATION

(HG => heat generator)


Select parameter using   => value is displayed

T-OUTSIDE	Outside temperature
T-BOILER DES	HG temperature setting
T-BOILER	HG flow temperature
MODULATION	Display of current degree of modulation **)
T-RELAY 1	temperature sensor
T-COLLECTOR 1	Collector sensor 1 *)
T-COLLECTOR 2	Collector sensor 2 *)
T-SOLID FUEL	Solid fuel boiler *)
T-BUFFER L 1	Buffer storage tank sensor below 1 *)
T-BUFFER T 1	Buffer storage tank sensor top 1 *)
T-BUFFER L 2	Buffer storage tank sensor below 2 *)
T-BUFFER T 2	Buffer storage tank sensor top 2 *)
S PW ACT	Current solar power in W *)
S CP DAY	Daily yield so far in W/kW/MW *)
S CP TOT	Total yield so far in W/kW/MW *)
RETURN	Exit level using 


# Operation

## Overview of display values and settings

! Display only appears if the sensor is connected and the value is present in the system. If the set value is not present it is masked out, or hyphens appear in the display (- - -).

Hot water	
T-DHW RATED	Current hot water temperature setting according to heating program, mode selector switch and holiday program
T-DHW	Current hot water temperature
T-DHW L	Hot water temperature at the lower sensor
RETURN	Exit level using 

\*\*) By pushing the Prog key you obtain the max. value since midnight. By pushing the Plus/Minus key you can alternate between max. and min. value.




Heating circuit	
T-ROOM DES A	Current set room temperature according to heating program, (also see page 6) Mode selector switch and Holiday program
T-ROOM **)	Current room temperature
HUMIDITY **)	Current room humidity in %
T-FLOW RATED	Current flow temperature setting
T-FLOW	Current flow temperature
N-OPT-TIME	Previous time required to heat up with heat-up optimisation activated
RETURN	Exit level using 

# Operation

## Overview of display values and settings

### User Area

All the settings that can be made by the operator of the system.

 Hinged cover OPEN → search for level with  , open with 

### GERMAN => Language

Select controller language

### CONTRAST

Adjust intensity of display

### DISPLAY SEL

Select additional display in standard operation

-----

=> no additional display DAY

WEEKDAY

=> weekday (Mo, Tue, We, ....)

T-OUTSIDE

=> outside temperature (TA)

T-FLOW  1

=> Flow temperature Heating circuit 1 (TV)

T-DHW

=> hot water temperature (top) (WW)




T-BOILER


=> Temp. of the heat generator (TK)

T-ROOM  1

=> Set room temperature Heating circuit 1 (TR)

### INSTALLATION

All settings that **cannot** be assigned to a consumer circuit (consumer circuits: heating circuits and HW).  Select value,  adjust and  save

Designation	Value range	Default	IV*)
GERMAN	Acc. to version	GERMAN	
CONTRAST	(-20) - (20)	0	
DISPLAY SEL	Sensor, weekday	----	
STATUS	0/1	1	
RETURN	Exit level using 		

### Additional on accordingly installation:

HUMIDITY

=> Current humidity in % (RH)

T-RELAY 1

=> see page 11 (TZ)

T-COLLECTOR

=> see page 11 (TS)

T-BUFFER L

=> see page 11 (BL)

S PW ACT

=> see page 11 (CY)

S CP DAY



=> see page 11 (DY)

S CP TOT

=> see page 11 (TY)

### STATUS

Activate status displays in standard display

(e.g.  Heating time,  reduction time, I - III heating time 1, 2 or 3)

### \*) IV = Internal Values:

Space for entering the parameters stored in the system!


# Operation

## Overview of display values and settings

### 1X DHW (1x Hot water)

01 => Storage capacity will be released for one load (such as showering outside the hot water periods)  
Charging starts when temperature drops one hysteresis level below the "set temperature 1".

\*) KM at BUS ID 00/01

Hot water			
Designation	Value range	Default	IV
1X DHW	00, 01 (OFF/ON)	00 = OFF	
T-DHW 1 DES	Hot water set temperature (only for KM/KM1)	60°C	
T-DHW 2 DES	Hot water set temperature (only for KM/KM1)	60°C	
T-DHW 3 DES	Hot water set temperature (only for KM/KM1)	60°C	
ANTILEGION *)	00, 01 (OFF/ON)	00	
RETURN	Exit level using 		

# Operation

## Overview of display values and settings

### T-ROOM DES 1-3

Required room temperature setting

T-ROOM DES 1

=> used in first enable time,

T-ROOM DES 2

=> used in second enable time,

T-ROOM DES 3

=> used in third enable time of active heating program for this heating circuit.

### T-REDUCED

Required room temperature setting during night reduction


### T-ABSENCE

Set desired room temperature during holidays and heating time suspension

### BOB-VALUE

For a value >0 burner start-up is not permitted, as long as room temperature is still above the set room temperature (BOB-VALUE).

**!** This function may be affected by alternative energy sources that are connected via bus (e.g. SD3-Can).

Heating circuit			
Designation	Value range	Default	IV
T-ROOM DES 1 *)	5°C - 40°C	20°C	
T-ROOM DES 2	5°C - 40°C	20°C	
T-ROOM DES 3 *)	5°C - 40°C	20°C	
T-REDUCED	5°C - 40°C	10°C	
T-ABSENCE	5°C - 40°C	15°C	
BOB-VALUE	0K - 20K	0K	
T-LIMIT DAY	----, (-5)°C - 40°C	19°C	
T-LIMIT N	----, (-5)°C - 40°C	10°C	
HEATSLOPE	0,00 - 3,00	1,20	
ADAPTION	00, 01 (OFF/ON)	00 = OFF	
ROOMS-INFL	00 - 20	10	
ADAP ROOM-T	(-5,0)K - (5,0)K	0,0K	
OPTIM HEAT	00, 01, 02	00	
MAX OPT-TIME	0:00 - 3:00 [h]	2:00 [h]	
ECONO OPTI	0:00 - 3:00 [h]	0:00 [h]	
PC-ENABLE	0000 - 9999	0000	
RETURN	Exit level using 		

\*) depending on function selector  
Heating circuit T-FLOW-DAY or  
T-FLOW-NIGHT



# Operation

## Overview of display values and settings

### T-LIMIT DAY/T-LIMIT N (Day/Night)

Only valid if the function is activated  
=> Set value "Expert/Heating circuit/  
PUMP MODE = 01=> Pump switching  
according to heating limit"

If the outside temperature that is measured and calculated by the controller exceeds the heating limit specified here, heating is disabled, the pumps switch off and the mixers are closed. The heating is enabled again when the outside temperature drops below the set heating limit by 1K (= 1°C).

#### T-LIMIT DAY

=> applies during heating times

#### T-LIMIT N

=> applies during reduction times

"----" => The heating limit is deactivated. The circulation pump is switched in accordance with the standard function (see chapter entitled "Circulation pump control")

### HEATSLOPE

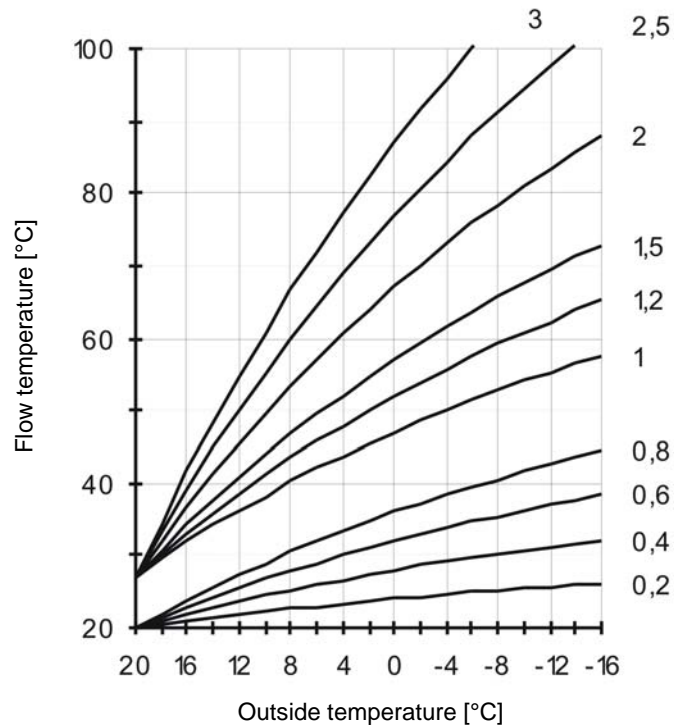
The gradient of the heat slope indicates by how many degrees the flow temperature changes if the outside temperature rises or drops by 1 K.

#### Setting tip:

At cold outside temperatures, room temperature too low => Increase heat slope (and vice-versa)

At high outside temperature (e.g. 16°C) room temperature too low => correction via set room temperature

### Heat slope diagram (setting aid)



### Setting 0 => Room control only

! The heat slope can best be set at outside temperatures below 5°C. The change in heat slope setting must be made in small steps and at long intervals (min. 5 to 6 hours) because the system must first adjust to the new values each time the heat slope is changed.

# Operation

## Overview of display values and settings

---

### Guideline values

- Underfloor heating  
S = 0.4 to 0.6
- Radiator heating  
S = 1.0 to 1.5

### ADAPTION (Heat slope adaptation)

Function for automatic heat slope setting

#### Start conditions:

- Outside temperature < 8°C
- Room temperature < 18°C

During adaptation the room starts to be heated after 3 hrs. of reduction time (at night). Room temperature control takes place with a set value of 21 °C. As soon as the room temperature exceeds 20 °C, the room is controlled to 20 °C for another ½ hr. Then the flow temperature and the outside temperature are measured. The optimum gradient is calculated from these values and taken over into the controller.

The calculation is performed **once** after activation. The smallest possible heat slope for radiator heating is defined to be "1". For surface heaters (floor, wall, ceiling etc.) heat slopes of less than "1" should be selected.

If the room temperature has not been reached after 4 hours during adaptation, adaptation is stopped (warning symbol blinks). If the adaptation is stopped it is repeated on the next day.

! Hot water preparation is disabled during adaptation.

### ROOMS-INFL (Room sensor influence)

The boiler temperature is increased by the set value when the temperature drops below the required room temperature by 1K.

=> High values lead to fast control and large boiler temperature fluctuations.

----

=> pure weather-dependent control

0 => pure weather-dependent control \*)

20 => pure room temperature control

\*) Special function with  
ROOMS-INFL = 0

For one-off heating requirements during the night reduction the heating pump continues to run until the next heating period is reached (see chapter entitled "Circulation pump control").

### ADAP ROOM-T (room sensor adaptation)

In the case of room control (e.g. with FBR) the measurement can be corrected using this setting if the room sensor is not measuring correctly.

### OPTIM HEAT (Heating optimisation)

Activation of function for automatically bringing forward the start of heating.

#### Example:

Heating program 6.00 hrs - 22.30 hrs

#### OFF

Building starts to be heated at 6.00 hrs.

#### ON

Depending on weather and room temperature, heating starts soon enough so that building just reaches the set room temperature at 6.00 hrs.

00 => start of heating not brought forward

01 => brought forward depending on weather

02 => brought forward depending on room temperature

! Warm-up optimisation occurs only if the reduced time of the heating circuit is at least 6 hours.

### MAX OPT-TIME (Maximum bring-forward)

Only active with "HOT-OPTIM = 01 or 02"

The start of heating is brought forward by no more than this time.

### ECONO OPTI (Reduction optimisation)

Automatic reduction of burner disabling to end of set heating time.

The burner is not restarted before the end of the heating period during the set time period (last heating time only) if it not already in operation.

This function prevents short-term heating of the heat generator to the end of the heating period.

### PC-ENABLE

Code number for enabling access to heating circuit data from a PC  
"0000" => access is blocked.

### RETURN

Exit heating circuit level =>  
Return to "User" area.

# Operation

## Overview of display values and settings

### Timer Program Area

All the time programs can be set in this area.

#### Selecting a timer program

Open hinged cover => "Display => System",

▲ to the right until clock

=> "USER => INSTALLATION",

▲ to the right until clock

=> "TIME PROGRAM

=> HOTW-PROG"

▲▼ => Select timer program

=> e.g. "HTG-PROG 2"

= Heating program 2 for controller heating circuit

☐ Confirm/open timer program

=> "MONDAY"

#### List of available time programs

With maximum controller configuration

Select timer program using ▲▼☐

select timer program for display or adjustment

HOTW-PROG	Enabling program for hot water charging pump
HTG-PROG 1	1st heating program for controller heating circuit
HTG-PROG 2	2nd heating program for controller heating circuit
RETURN	Exit level using ☐

#### Timer/heating program adjustment

▲▼ Select weekday (Mo-Su) or block

(MO-FR => Monday-Friday, SA-SU

=> Saturday-Sunday, MO-SU =>

Monday-Sunday)

☐ Open weekday/block (see left)

=> "I ON 20°C" First switch-on

time - set value I = 20°C

▲ Set first switch-on time

=> for example 6:00 hrs

☐ Confirm first switch-on time

=> "I OFF 20°C" First switch-off

time - set value I = 20°C

▲ Set first switch-off time

=> for example 8:00 hrs

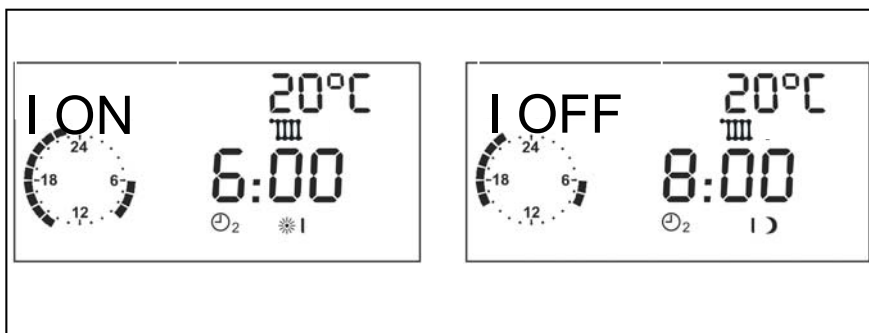
☐ Confirm first switch-off time

=> "II ON 20°C" First switch-off

time - set value II = 20°C

▲▼☐ Switch-on and switch-off times

2 and 3 are entered in the same way - please enter all values!



▲▼ Select another weekday/block for

entry or exit heating program 2 with "RETURN" and set another program.

! The heating times are not saved until all the times for a weekday/block have been entered.

„- - -“ for a switch-on/switch-off time

=> The relevant heating timer is deactivated.

#### Symbols:

I ON = First switch-on time  
(I OFF = first switch-off time)

20°C = Set room temperature for displayed heating time

Clock = Approximate program display [full hours]

III = Program for heating circuit 1

⌚<sub>2</sub> = Heating program 2,

⌚<sub>1</sub> = Heating program 1

☀I = Start time 1, I☾ = Stop time 1,

☀II = Start time 2, II☾ = Stop time 2,

☀III = Start time 3, III☾ = Stop time 3

# Operation


## Overview of display values and settings

### Heating program 1

Factory setting:

Mo. to Fr.: 06:00 to 22:00

Sa. and Su.: 07:00 to 23:00


	Heating time 1		Heating time 2		Heating time 3	
Mo.						
Tu.						
We.						
Th.						
Fr.						
Sa.						
Su.						

### Heating program 2

Factory setting:

Mo. to Fr.: 06:00 to 08:00,  
16:00 to 22:00

Sa. and Su.: 07:00 to 23:00


	Heating time 1		Heating time 2		Heating time 3	
Mo.						
Tu.						
We.						
Th.						
Fr.						
Sa.						
Su.						

### Hot water

Factory setting:

Mo. to Fr.: 05:00 to 21:00

Sa. and Su.: 06:00 to 22:00

	Heating time 1		Heating time 2		Heating time 3	
Mo.						
Tu.						
We.						
Th.						
Fr.						
Sa.						
Su.						

## Overview of display values and settings

### Expert area

It is only possible to change these set values after entering the code number.

⚠ If these values are set incorrectly, they may cause malfunctions or damage to the system.

#### CODE-NO

Entering the code number allows all of the expert settings to be modified => including the code number itself (first parameter)

⚠ press => CODE-NO 0000

☞=> ⚠ 1st digit ☞=> ⚠ 2nd digit

☞=> ⚠ 3rd digit ☞=> ⚠ 4th digit

☞=> ⚠

#### BUSID (Heating circuit number)

The heating circuits are sequentially numbered starting with "01". Heat circuit numbers must not be assigned twice. For replacement controllers, please enter exactly the same heating circuit numbers as the replaced controller.

#### TIMEMASTER (Only without or TIME MASTER in system)

00 no time master => each heating circuit has its own time

01 controller is time master => all controllers and remote controls take over the time settings of this controller.

! No more than 1 TIME MASTER is permitted in the system!

\*) KM at BUS ID 00/01

\*\*) For a mixer motor with control, the mixer run time must be set at the mixer motor control.

INSTALLATION			
Designation	Value range	Default	IV
CODE-NO	0000 - 9999	Entry	
CODE-NO (adjustment)	0000 - 9999	0000	
BUS ID	(00), 01-15	01	
TIME MASTER	00, 01 (OFF/ON)	00 = OFF	
*) KM only with second burner stage			
MAX T-MODUL *)	30°C - 110°C	85°C	
MIN T-BOILER *)	10°C - 85°C	40°C	
T-BOILER DHW *)	0K - 50K	20K	
WARM-UP-T *)	10°C - 85°C	35°C	
MIN DELIMI *)	00/01/02(Off/On/Permanent)	00	
HYSTERESI *)	5 - 20 K	5K	
HYST TIME *)	0 - 30 min	10 min	
LOCK TIME *)	0 - 30 min	0 min	
HYST BURNER2 *)	2K - 20K	2K	
RETURN	Exit level using ☞		

#### HS-T DHW

(Heat generator superheating during hot water preparation)

Heat generator set temperature during hot water preparation = Hot water set temperature + HS-T DHW

! The heat generator must be run at a higher temperature during hot water preparation so that the hot water temperature in the storage tank can be reached via the heat exchanger.

#### MIN-DELIMI (minimum limit heat generator)

Reduces condensation in the heat generator when heating demand is low. In all cases, the heat generator is never switched off before the minimal heat generator temperature has been reached MIN T-HS+ HYSTERESIS.

#### 00 = Minimum limit on heat slope

The heat generator switches on when the temperature drops below the temperature demanded by the consumers (HS SET TEMP).

#### 01 = Minimum limit during heating requirement

During heating requirement (Pump enabled), the heat generator maintains at least the set minimum temperature MIN T-HS.

#### 02 = Permanent minimum limit (24 hours)

The heat generator maintains at least the set minimum temperature MIN T-HS over 24 hours.

# Operation

## Overview of display values and settings

---

### **DELAY ST**

(blocking time 2. burner stage)

### **HYST BURNER 2**

(hysteresis 2. burner stage)

### **Switch on the 1st Burner stage**

when temperature drops below set temperature of the heat generator.

### **Switch off the 1st burner stage**

when the temperature setting is exceeded by the HYSTERESIS.

### **Switch on the 2nd burner stage**

- after start of 1st burner stage
- and temperature drops below temperature setting by 5K (= start of blocking time / enable 2nd. burner stage)
- and expiration of blocking time

### **Switch off 2nd burner stage**

when the temperature setting is exceeded by the HYSTERESIS.

### **Switch 2nd Burner stage**

when temperature drops below set temperature of the heat generator.

### **Switch off the 1st burner stage**

when 2nd stage enabled after set temperatures are exceeded by [HYSTERESIS + 2HYST BURNER 2]

# Operation

## Overview of display values and settings

**HC FUNCTION** (heating circuit function)

**00 => Standard heating circuit**

**01 => Control to fixed flow temperatures**

During the heating periods (see heating program ) the heating circuit is operated with a fixed preset flow temperature [T-FLOW-DAY], and during reduced mode operation with a fixed preset flow temperature [T-FLOW-NIGHT] accordingly.

**PUMP MODE** (pump operating mode)  
The circulation pumps are switched off if heating is not required. The mixer motors are closed at the same time => "The heating circuit is switched off". (Switch on with 1K hysteresis)

The setting affects the weather-controlled deactivation. Additionally, the thermostat-controlled deactivation takes effect if room regulation is activated (ROOMS-INFL > 0).

- Room temperature > room set value + 1K

**00 => Standard circulation pump control**

Heating time:

- Outside temperature > room set value +1K

Reduction time:


ROOMS-INFL =0:

- The switch-off occurs during the transition to reduction operation.
- Restart: Room temperature < room set value The pump runs continuously after switching on.

ROOMS-INFL = "--,":

- Flow temperature setting < 20°C.

The parameters in this level change in accordance with the heating circuit function that has been selected [HC FUNCTION]

Heating circuit			
Designation	Value range	Default	IV
HC FUNCTION	00 - 01	00	
PUMP MODE	00 - 03	00	
MIXER DYNAM (type sign Mixer motor) **	30-240 s	120s	
MAX T-FLOW	20°C - 110°C	80°C	
MIN T-FLOW	10°C - 110°C	10°C	
T-FROST PROT	----; (-15)°C - (5)°C	0°C	
OUT-TEMP-DEL	0:00 - 24:00	0:00	
SLOPE OFFSET	0K - 50K	5K	
B-HEAT SINK	00, 01 (OFF/ON)	01 = ON	
I-CONTROL	OFF, 03:00 h-00:15 h	OFF	
RETURN	Exit level using 		

**01 => Pump switching in accordance with heating limits**

Heating time:

- Outside temperature < daytime set heating limit +1K

Reduction time:

- Outside temperature < set night-time heating limit +1K

**02 => Pump switching in accordance with heating program**

Heating time:

- Pump is ON; Heat circuit is enabled

Reduction time:

- Pump is OFF; Heat circuit is blocked

**03 => Continuous operation**

The runs continuously for 24 hrs.! The heating circuit is permanently enabled.

# Operation

## Overview of display values and settings

---

**MIXER DYNAM** (Mixer running time)  
Control parameter (see rating plate on motor operator). Required time for complete opening of the mixer (in seconds).

**MAX T-FLOW** (maximum flow temperature)  
The measured temperature setting for the heating circuit flow is limited to the maximum flow temperature setting (overheating protection).

⚠ The pump of the **direct** heating circuit is not switched off until the boiler temperature exceeds the set maximum flow temperature by 8K. The heating circuit pump has already been switched on again when the boiler temperature drops below the temperature [maximum flow temperature + 5K].

**MIN T-FLOW** (minimum flow temperature)  
The measured temperature setting of the heating circuit flow is increased to the minimum flow temperature setting (e.g. with air heating).

**T-FROST PROT** (frost protection temperature)  
If the outside temperature drops below the programmed value, the system switches to frost protection mode (pumps are switched on).  
"----" Frost protection mode is deactivated!

**OUT-TEMP-DEL** (outside temperature delay)  
The selected outside temperature delay must be matched to the type of construction of the building. In the case of heavy structures (thick walls), a long delay must be selected since a change in outside temperature affects the room temperature later accordingly. With light structures (walls have no storage effect) the delay should be set (0 hrs.).

**SLOPE OFFSET** (heating slope distance)  
The boiler temperature that is required for a mixer circuit is calculated by adding the calculated temperature setting for the heating circuit flow to the heating curve distance. The heating curve distance compensates for sensor tolerances and heat loss up to the mixer.

**B-HEAT SINK** (circuit enable)  
00 => OFF  
01 => The heating circuit can be used by higher-order functions (e.g. cooling function of a heat generator to protect from overheating; heat removal during service mode) as a heat sink/consumer. The heating circuit is heated at the maximum flow temperature setting for the duration of the function.

! Only for mixer mode. For boiler operation the B-HEAT SINK is always turned on.

**I-CONTROL = integrative part (e.g. 30 min)**  
If there is a deviation of the room temperature of 1 K for the adjusted time period, the flow temperature is increased by the value "room sensor influence". Usual value: "30 min".



# Operation


## Overview of display values and settings

### DHW RELIEF (Charging pump relief)

The charging pump is switched on when the boiler temperature exceeds the storage tank temperature by 5 K. Switch-off if boiler temperature < storage tank temperature or if storage tank temperature > desired temperature (+ delayed switch-off).

### PARALLEL (Parallel pump operation)

The heating circuit pumps operate during hot-water generation.

Hot water *)			
Designation	Value range	Default	IV
DHW RELIEF	00/01 (Off/On)	01	
PARALLEL	00/01 (Off/On)	00	
RETURN	Exit level using 		
*) KM at BUS ID 00/01			

## General function description

---

### Heat circuit control

#### Weather-dependent control

The boiler or flow temperature is determined via the set heat slope to suit the measured outside temperature in such a way that the set value for the room is approximately set if the heating system is configured correctly.

=> Exact setting of the heat slope is extremely important for weather-dependent control.

The circulation pump is controlled weather-dependently. The circulation pump is switched on if there is a heating demand and in Frost-protection mode.

#### Room sensor influence

The current room temperature can be included in computation of the required flow temperature via a present room temperature sensor.

The influence factor (parameter list) can be set between 0 (fully weather-dependent regulation) and 20 (room temperature regulation with minimal outdoor temperature influence). Position "----" deactivates room temperature control. Positions "----" and "0" indicate differences for demand-dependent circulation pump control.

#### Hot water generation

The operating module hot water program affects the hot water temperature setting I of the connected main controller. The main controller hot water program is additive.

#### Frost protection function

The frost protection circuit prevents the heating system from freezing by automatically switching heating operation on.

#### Outdoor sensor frost protection

If the measured outside temperature drops below the set frost protection temperature the room temperature setting is set to 5°C for the relevant heating circuit. The heating circuit is enabled:

- the pumps are switched on
- the heat request is sent to the boiler

"----" => outdoor sensor frost protection deactivated

The function stops when the outside temperature increases to 1K above the frost protection temperature setting.

#### Frost protection via room sensor

If the room temperature drops below 5°C the frost protection function is activated.


The room temperature setting for the relevant heating circuit is set to 5°C.

The heating circuit is enabled:

- the pumps are switched on
- the heat request is sent to the boiler

#### EEPROM check

Every 10 minutes, a check is conducted automatically in order to establish whether the settings of the controller lie within the specified limits. If a value is found to be out-of-range, it is substituted by the related default value. The range transgression is indicated

by the blinking  and the error number 81.

In this case, the user should check the important settings of the controller. The warning symbol is cleared after the unit is restarted (RESET).

#### Delayed pump switch-off

In the case of switch-off of the circulation pumps, the circulation pumps are not switched off until 5 minutes later if one of the burners was on during the last 5 minutes before the switch-off instant.

#### Pump blocking protection

The controller effectively prevents blocking of the pumps if they are not switched on for long periods. The integrated protection function switches on all pumps which have not been in operation during the past 24 hours for 5 seconds at 12.00 hours every day.

#### Mixer motor blocking protection

If the mixer motor has not moved for 24 hours it is fully opened at approximately 03:00 hrs. (once only). The heating circuit pump is switched off during this time. The maximum flow temperature is monitored. Cancelled at maximum flow temperature – 5K.

# Operation

## Installation and Start-up

### Installation

1. Attach base to wall (at about eye level)
2. Connect terminals 1-4 of base to boiler CAN BUS terminals.
3. **Optionally** connect remote telephone switch or external room sensor [terminals 3+6]
4. Clip on top part of controller by putting on/clipping on at middle of top edge and then swivelling down onto base with gentle pressure and pushing on.

#### Dimensions:

147 mm x 97 mm x 33 mm

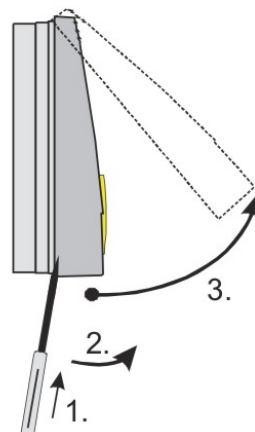
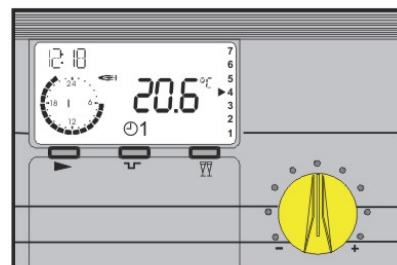
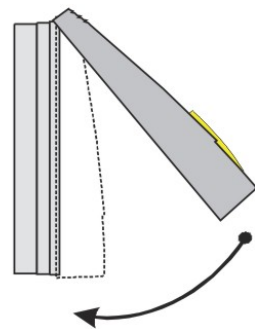
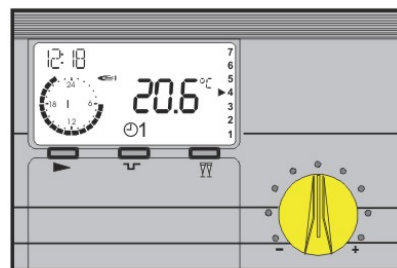
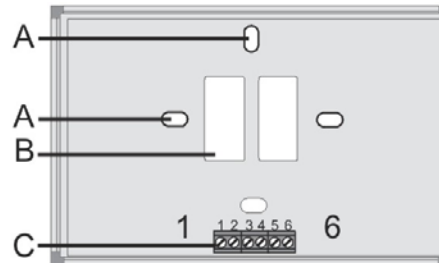
- A: Attachment holes (suitable for fitting to switch box)  
B: Breakthrough for leading cable through  
C: Connecting terminal (PIN 1 is on the left)

#### Connecting terminals

PIN 1: CAN H  
PIN 2: CAN L  
PIN 3: CAN - (GND) / eBUS - / telephone switch (GND)  
PIN 4: CAN + (12V)  
PIN 5: eBUS +  
PIN 6: ext. room sensor or remote telephone switch

#### Dismantling

Pry off with a screwdriver using the opening on the underside. Then swivel the underside upwards by hand using a rotating movement.






## Installation and Start-up

### Commissioning

#### Commissioning procedure

1. Please read this guide carefully before commissioning
2. Fit controller, make electrical connections and switch on boiler and supply voltage
3. Wait until standard display appears on controller
4. Open hinged operating cover

When the hinged operating flap is opened for the first time after switching on, the "INSTALLATION" is shown on the display.

5.  Start INSTALLATION
6.  Set value
7.  Save value and next value
8. Close hinged operating flap (end of INSTALLATION)
9. Move program switch to required operating mode, e.g. automatic 1 (see page 4)


#### Bus ID (heating circuit number):

The heating circuits are sequentially numbered starting with "01". Heat circuit numbers must not be assigned twice. Please only use "00" for replacement controllers.

#### Commissioning level

All the values in this level must be entered in sequence without interruption

 Open level,  adjust value,  save value and activate next value

GERMAN	Set language
TIME	Set current time: 1. Minute =>  => 2. Hour
YEAR	Set current date
MONTH	Set current date
DAY	Set current date
BUSID (siehe S. 29)	Enter heating circuit "1" number: 00-15 => Standard 01

# Operation

## Installation and Start-up

### System bus

#### The heating system

This controller can be expanded in a modular fashion using additional modules that are connected via the integrated bus. In its maximum configuration, the system can be used to control the following heating system components

- |      |  |
|------|--|
| 1-8  | Boiler (modulating or switching)             |
| 1-15 | Mixed weather-dependent heating circuits     |
| 0-15 | Room controller (digital or analogue)        |
| 1    | Solar system (2 collectors, 2 storage tanks) |
| 1    | Solid fuel boiler                            |

The various components are simply coupled to the system bus. The modules log on to the system automatically and search for their communication partners via the defined bus IDs (heating circuit number or boiler number).

#### Bus ID

##### For mixer motor controllers and control units

The bus ID (00-15; expert level parameter) is used to number the heating circuits in the system. Each operating module and each mixer motor module is given the number of the assigned heating circuit as its bus ID.

- Heat circuit numbers (00-15) may not be assigned twice.
- Heat circuit numbers 00 and 01 may not be used simultaneously.
- The heating circuits are sequentially numbered starting with "01".
- Please only use heating circuit number 00 for replacement controllers if "00" was used in the replaced controller.

#### Pre-settings

Heat circuit 1 → 01

! After setting all the bus ID's the system must be reenergised (once only).

### If there are problems

#### Reset

Press with pointed object (paper clip) => restart the device.

🗨 Press Prog button and Reset button simultaneously, release Reset button and keep pressing Prog button until "EEPROM" appears in the display => All settings are reset to the factory settings (except the heating programs and the hot water program)



- Restart => press Reset
- Load factory settings => press Reset + Prog

### Fault Indicators

#### Fault numbers:


- A:** Fault code with warning triangle  
**B:** Fault identification using fault number

! See description of connected controller for explanation of fault numbers!



## Installation and Start-up


### Error messages


If a fault or error occurs in the heating system, you will see a blinking warning triangle () and the related error number on the controller display. Please refer to the table below for the significance of the displayed error code. The system must be restarted after a fault has been remedied => RESET.

### RESET:

Brief device shut-off (mains switch). Controller restarts, reconfigures itself and continues to operate with the values that have already been set.

### RESET+

Overwrite all settings with default values (except language, time and sensor values). The additional button () must be pressed when the controller is switched on (mains on) until "EEPROM" appears in the display.

Error no.	Error description
<b>Communication error</b>	
E 90	ID 0 and 1 on bus. Bus IDs 0 and 1 may not be used simultaneously.
E 91	Bus ID used. The set bus ID is already in use by another device.
<b>Internal error</b>	
E 81	EEPROM error. The invalid value has been replaced with the default value  Check parameter values!
<b>Sensor error (break/short)</b>	
E 67	Solar panel sensor 2
E 68	Solar panel sensor 1
E 69	Flow sensor HC2
E 70	Flow sensor HC1
E 75	Outdoor sensor
E 76	Storage tank sensor
E 77	Boiler sensor
E 78	Header sensor
E 79	Sensor multifunction relay 1
E 80	Room sensor HC1
E 83	Room sensor HC2 / Lower buffer sensor / Pool sensor
E 84	Humidity sensor

# Operation

## Installation and Start-up

### Troubleshooting

#### General

If your system malfunctions you should first check that the controller and the control components are correctly wired.

#### BUS connection:

**In control devices with connection to Mixer motor =>** Communication symbol appears in standard display ("❖" or "❖" depending on version)

**Boiler controller =>** Outside temperature and boiler temperature display (see "Display/Installation")

#### In boiler controller with connection to

**Control unit =>** Room temperature displayed and current room temperature setting blanked out "----" (see "Display/Heat circuit")

#### In mixer motor expansion controllers with connection to

**Boiler controller =>** Outside temperature and boiler temperature display (see "Display/Installation")  
**Control unit =>** Room temperature displayed and current room temperature setting blanked out "----" (see "Display/Heat circuit")

#### Remote telephone switch

The controller can be switched to heating operation using a remote telephone switch (☼). Hot water operation is enabled during this time (if using an external storage tank).

#### Telephone switch connection: Connecting terminals 3+6.

As soon as a short circuit is detected at these terminals the controller switches to heating operation (with room temperature setting I) and enables hot water preparation. As soon as the short circuit has been remedied the heating returns to the selected operating mode and heating program.

#### In case of communication problems

Check connecting cables: Bus lines and sensor lines must be laid separately, away from mains cables! Wrong polarity?

Check bus feed:

There must be at least 8V DC between the "+" and "-" terminals of the BUS connector (connector IX, terminals 3+4). If you measure a lower voltage, an external power supply must be installed.

#### Pumps do not switch off

Check operating mode => Standard ☺ (☼ ?). Check "PUMP MODE" setting (Standard 00).

#### Pumps do not switch on

Check operating mode => Standard ☺ (test ☼)

Check time and heating program  
=> Heating time

Check pump switching  
=> Type of pump switching

Standard => Outside temperature > Room temperature setting?

Heating limits => Outside temperature > Valid heating limit?

Room control => Room temperature > Temperature setting + 1K

#### Fault 81

This fault indicates a change to the controller memory (e.g. caused by EMC). Please check all settings.

#### Other fault numbers

Other fault numbers may be displayed in the controller by the boiler or mixer motor controller. Please look up the explanation in the boiler documents.

Technical data	
Supply voltage	12 V DC +/- 15%
Power consumption	~ 25 mA
Enclosure to EN 60529	IP 40
Safety class II to EN 60730	III
Power reserve of the timer	> 10 hours
Permitted ambient temperature during operation	0 to 50 °C
Permitted ambient temperature during storage	- 20 to 60 °C
Room sensor	NTC measuring resistance 5 kΩ
- Tolerance in ohms	+/-1% at 25°C
- Temperature tolerance	+/- 0,2K at 25°C

**Service:**

**Rendamax bv**

Hamstraat 76  
6465 AG Kerkrade  
Parkstad nr. 5007

P.O. Box 1035  
6460 BA Kerkrade  
The Netherlands

Tel. (+31) 45 5669 900  
Fax (+31) 45 5669 910