

# E8

## Heating Controller

## Operating and Installation Instructions



**Please observe the safety instructions and read through this manual carefully before commissioning the equipment.**

## **Safety information**

### **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.

- ⚠ Improper installation may result in danger to life and limb.

### **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 notes are denoted by an exclamation mark.

- ⚠ This attention symbol is used to point out dangers in this manual.

### **Installation**

Notes on installation and commissioning and a connection plan can be found in part 4 of this manual.

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

## **Description**

### **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 device consists of a two-stage regulation for heat generators, a service water heating system, control system for two mixed heating circuits, as well as the following auxiliary functions:

- 1 timer-controlled output (circulation pump)
- 1 temperature-controlled output

The following functions may be assigned to this output (circulation pump, header pump, solar integration, heat generator for solid fuel, return flow temperature increase).

- Demand-related circulation pump control
- Automatic toggle between summer and winter time
- Automatic adjustment of function in accordance with the sensor configuration





**Contents**

<b>General information</b>	<b>2</b>	Hot water	12
<b>Safety information</b>	<b>2</b>	Heat circuit I / II	12
Power connection regulations	2	<b>Part 2: Overview of display values and settings</b>	<b>13</b>
Warranty conditions	2	<b>General area</b>	<b>13</b>
Important text passages	2	Date/Time/Holiday	13
Installation	2	Service	15
<b>Description</b>	<b>2</b>	Code number Entry	15
Declaration of conformity	2	RELAY TEST	15
Function	2	SENSOR TEST	16
<b>Contents</b>	<b>3</b>	SOFTWARE NO XXX-XX	17
<b>Part 1: Operation</b>	<b>7</b>	BURN TIME and BURN START	17
<b>Operation in normal mode</b>	<b>7</b>	STL-TEST XX,X°C	17
Operating elements	7	SERVICE	17
⊙ Operating mode selection	7	RESET ...	17
Effect of the operating mode	8	<b>Display Range</b>	<b>18</b>
Display in normal operation	9	INSTALLATION	18
<b>Changing the settings</b>	<b>10</b>	OUTSIDE TEMP	18
Operating elements	10	HG SET TEMP	18
Operating level	11	T-HS	18
Areas	12	Temperature of the multifunction relay	18
General	12	MODULATION	19
Display	12	BUFFER-T-L	19
Users	12	Hot water	20
Time programs	12	heating circuit I / II	20
Expert	12	T-DHW LOWER	20
Levels	12	DES ROOMTEMP	20
INSTALLATION	12	ROOMTEMP (room temperature)	20

<b>User Area</b>	<b>21</b>	<b>Timer Program Area</b>	<b>27</b>
INSTALLATION	21	List of available time programs	27
GERMAN => Language	21	Selecting a timer program	27
CONTRAST	21	Timer/heating program adjustment	28
DISPLAY SEL	21		
SELEC-PROG	21	<b>Expert area</b>	<b>31</b>
Hot water	22	INSTALLATION	31
1X DHW (1x Hot water)	22	CODE-NO	31
DHW-TEMP 1-3		BUS ID HS1	31
(Hot water temperature setting)	22	BUS ID1 / 2 (heating circuit number)	31
BOB-VALUE (Operation Without Burner)	22	BUS TERMINATION	31
CIRCL-P-DHW (Circulation with hot water)	22	AF SUPPLY (Outdoor sensor power supply)	32
ANTILEGION		TIME MASTER	32
(Hot water short time heating function)	22	MAX T-HS	
Heating circuit I / II	23	(Maximum heat generator temperature)	32
MODE	23	MIN T-HS(Minimal heat generator temperature)	32
T-ROOM DES 1-3	23	WARM-UP-T (Warm-up relief)	32
ECONO TEMP	23	MIN-DELIMI (minimum limit heat generator)	32
REDUCED TEMP	23	HYSTERESIS (dynamic switching hysteresis)	33
T-LIMIT DAY/T-LIMIT N (Day/Night)	24	HYST TIME (Hysteresis time)	33
HEAT SLOPE	24	<b>Operation with two-stage heat generators or with 2 heat generators</b>	<b>33</b>
ADAPTION (heat slope adaption)	25	DELAY ST (blocking time 2. burner stage)	33
ROOMS-INFL (Room sensor influence)	25	HYST BURNER 2 (hysteresis 2. burner stage)	33
ADAP ROOM-T (room sensor adaptation)	25	SEQUENCE CHANGE(time for switching HS)	34
OPTIMIZAT (Heating optimisation)	26	HS COOL FCT (Cooling function for the heat generator)	34
MAX-OPT-TIME (Maximum bring-forward)	26	T-HS COOL (Start temperature for cooling)	34
ECONO OPTI (Reduction optimisation)	26		
PC-ENABLE	26		
RETURN	26		

<b>Auxiliary relay functions</b>	<b>35</b>	B-HEAT SINK (circuit enable)	46
RELAY FUNC 1 (function selection relay 1)	35	<b>Part 3: General function description</b>	<b>47</b>
T-RELAIS 1 (Switching temperature relay 1)	35	Heat circuit control	47
HYST RELAYS 1 (Hysteresis relay 1)	35	Weather-dependent control	47
RELAY FUNC 2 (function selection relay 2)	37	Room sensor influence	47
<b>Screed program</b>	<b>39</b>	Hot water generation	47
SCREED (activation of screed drying process)	39	Frost protection function	47
Hot water	40	EEPROM check	48
CP LOCK (Charge pump lock)	40	Delayed pump switch-off	48
PARALLEL (Pump parallel running)	40	Pump blocking protection	48
HS-T DHW (Heat generator superheating during hot water preparation)	41	Mixer motor blocking protection	48
HYST DHW (Hot water charging hysteresis)	41	<b>Part 4: Installation and Start-up</b>	<b>49</b>
DHW FOLLOWUP (pump run-down time)	41	<b>Installation</b>	<b>49</b>
THERM INPUT (storage tank with thermostat)	41	Assembly / Dismantling	49
WALL HUNG (for modulating HG)	41	Connecting instructions	50
CHARGE THROUGH	41	System diagram	51
heating circuit I / II	43	Electrical connection	52
HC FUNCTION		Version 1	52
(heating circuit function selection)	43	Version 2	53
PUMP MODE (pump operating mode)	44	Power terminal assignments	54
MIXER OPEN (mixer dynamics when opening)	44	Sensor terminal assignments	55
MIXER CLOSED		<b>Remote controls</b>	<b>57</b>
(Mixer dynamics when closing)	45	The operator module BM 8	57
MAX T-FLOW (maximum flow temperature)	45	Remote control FBR2	57
MIN T-FLOW (minimum flow temperature)	45	Sensor resistances FBR	58
FROST PROT (frost protection temperature)	45	DCF receiver	58
OUT-TEMP-DEL (outside temperature delay)	45	PC	58
SLOPE OFFSET (heating slope distance)	46	Maximum delimiter	59
		Telephone switch	59

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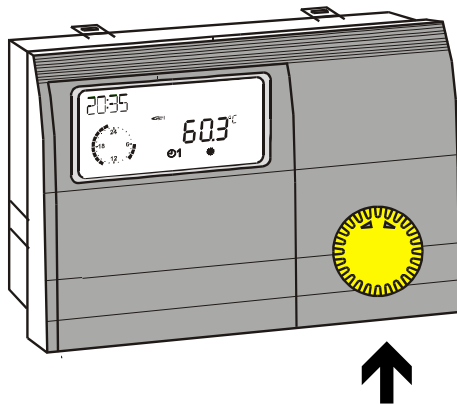
Sensor values / characteristic curve	60
Outside sensor AF (AFS) 	61
Boiler sensor KF (KFS) 	61
Flow sensor VF (VFAS) 	62
Storage tank sensor SPF (SPFS) 	62
<b>Commissioning</b>	<b>63</b>
Commissioning procedure	63
<b>System bus</b>	<b>64</b>
The heating system	64
Bus ID	64
Error messages	65
<b>Troubleshooting</b>	<b>66</b>
<b>Technical data</b>	<b>67</b>

## Part 1: Operation


**For initial start-up, please read the chapter "Installation and Start-up"**

### Operation in normal mode

(operating flap closed)



#### Operating elements

 Change the set operating mode

#### Operating mode selection

Turn the knob to select the operating mode required. The operating mode selected is indicated by a symbol at the bottom of 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 OFF and hot water preparation OFF, only frost protection mode)

 **Automatic mode 1**

(Heating according to timer program 1; DHW according to DHW program)

 **Automatic mode 2**

(Heating according to timer program 2; DHW according to DHW program)

 **Day mode**

(24 h heating with comfort temperature 1; HW according to HW program)

 **Night mode**

(24 h heating with reduced temperature; HW according to program)

 **Summer mode**

(Heating OFF, HW according to HW program)



**Service** (automatic reset after 15 min)  
heat generator regulated to heat generator set temperature  
= max. heat generator temperature= see page 32 ; when  
the heat generator temperature has reached 65°C, the  
consumers are regulated to their flow temperature to dissi-  
pate heat (cooling function).



The cooling function must be explicitly enabled in  
the consumer circuits by means of a set value.

### Effect of the operating mode

The operating mode set here affects the HS regulation and  
the integrated heating circuits of the controller.

Each heating circuit can be assigned a separate operating  
mode from the one set by means of the "operating mode"  
parameter in the user level of the corresponding heating  
circuit.

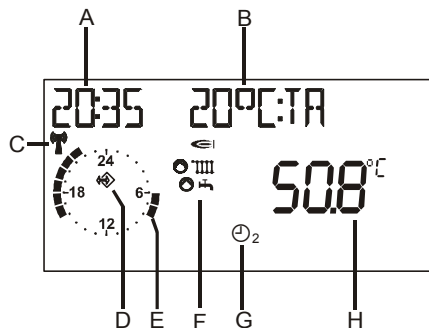
When the "⏻ = Standby/OFF", and "☀ = Summer mode"  
operating modes are set, they have a reducing effect on all  
heating circuits and consumer circuits in the entire system.  
(Boiler controller E8.0631, E8.0231, E8.0321)



For mixing controller E8.1121 only on these heating  
circuits.



### Display in normal operation



**!** Due to the tolerances of sensors, deviations of +/- 2K (2°C) are normal between various temperature displays. Temperatures which change rapidly can have higher deviations for short periods due to the different time-related behaviour of various sensors.

**!** The display of the current heating program applies to the device's first heating circuit. In case of having two heating circuits the display can be set to the 2nd circuit

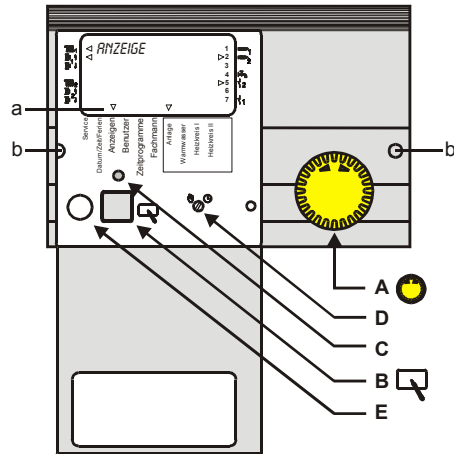
### Explanations

- A Current time
- B Freely selectable display (refer to "DISPLAY SEL" parameter)
- C DCF reception OK (only if receiver is connected)
- D Bus symbol (check data lead to connected controllers if this symbol does not appear)
- E Display of the active heating program for the first heating circuit (here: 6:00 to 08:00 hrs and 16:00 to 22:00 hrs)
- F Status display:  $\Rightarrow$  Burner ON; D Z heating mode; F Z hot water preparation
- G Mode selector switch, the display applies to all heating circuits for which a separate operating mode has been selected via the "MODE" set value (here:  $\oplus_2 \Rightarrow$  Heating according to timer program 2).
- H Display of current heat generator temperature

## Changing the settings

The operating flap must be opened first in order to change or request set values.

=> Controller switches to Operation mode



- a Display indicating the current level
- b Holes to unlock the controller fixation.  
Insert a thin screwdriver deep into the holes and then lift up the controller.

## Operating elements



A => Shaft encoder  
Search for value/level or adjust value



B => Programming key

- Select a value level
- Select a value level to change
- Save a new value



C => Change display  
LED ON => The value in the display can be changed by actuating the shaft encoder (A).




D => Manual-Automatic switch.  
In Manual mode, all the pumps and first burner stage are switched on. The mixers are not adjusted / controlled (display: "EMERG-MODE").

### Limitation (switch-of with 5K hysteresis):

- Burner => MAX T HS (Expert)
- Heating pumps => MAX FLOW-T (expert)
- Cylinder charging pump => DHW-TEMP I (user)
- △ Caution, overheating, e.g. with floor or wall heating! => Set mixer by hand!

E => PC connection via optical adapter

### Operating level




	General	SERVICE
		DATE/TIME/HOLIDAY
Open operating flap	☺ Turn anticlockwise	↗
	☹ Turn clockwise	↘
Display		INSTALLATION
		HOT WATER
		HEAT CIRCUIT I
		HEAT CIRCUIT II
User		INSTALLATION
		HOT WATER
		HEAT CIRCUIT I
		HEAT CIRCUIT II
Time programs		CIRCL TIME
		HOTW-PROG
		HEAT-PROG I  1
		etc...
Expert		INSTALLATION
		HOT WATER
		HEAT CIRCUIT I
		HEAT CIRCUIT II

### 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.

- ☺ Select the level in which the value to be adjusted or displayed can be found using the rotary knob.
-  Press Prog button! => Open / select level
- ☹ Search for value using rotary knob
-  Press Prog button! => Select value  
LED lights up => adjustment can now be made
- ☺ Modify value using rotary knob
-  Press Prog button! => Store value - LED goes off

## 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
- heating circuit I
- HEAT CIRCUIT II

### 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.

### Heat circuit I / II

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.



## Part 2: 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 )



<b>Date/time</b> => 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 to the left with , 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.

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.

<b>Holiday</b> => 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


<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




- ! 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.
- ! 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.

**Service**


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

(Select operating level using  and open with )

<b>Relay test</b> => Value group (code no. required) (General -> Service level) Select relay using  => relay switches	
00	No relay
01	Pump, heating circuit 1
02	Mixer OPEN, heating circuit 1
03	Mixer CLOSED, heating circuit 1
04	Pump, heating circuit 2
05	Mixer OPEN, heating circuit 2
06	Mixer CLOSED, heating circuit 2
07	Burner 1 ON
08	Burner 1 and 2 ON (2 after 10 seconds)
09	Hot water charging pump
10	Timer-controlled relay (multifunction relay 2)
11	Temperature-controlled relay (multifunction relay 1)

 Hinged cover OPEN → search for level to the left with ,  
open with 

A code number must be entered for this function.

 Select Relay Test => "Code number" level


**Code number Entry**

 Start code number entry => [LED]

 Select 1st digit

 Confirm entry

 Select 2nd digit

 Confirm entry

 Select 3rd digit

 Confirm entry


 Select 4th digit

 Confirm entry

=> "Relay Test"




**RELAY TEST**






 Start relay test

 Select relay => Relay switches

 Select next relay or use

 to stop relay test

Start sensor test with , use  to select sensor => temperature is displayed; Use  to stop sensor test

<b>Sensor test</b> => Value group (General -> Service level) Select sensor using  => value is displayed	
OUTSIDE TEMP	Outside temperature
T-HS	Temperature of the heat generator
DHW-TEMP	Hot water temperature
FLOW TEMP  1	Flow temperature, heating circuit 1
T-ROOM  1	Room temperature heating circuit 1 (only with remote control)
T-FLOW  2	Flow temperature, heating circuit 2
T-ROOM  2	Room temperature heating circuit 2 (only with remote control)
T-RETURN SOLID FUEL-T, T-COLLECTOR T-COLLECTOR T-CIRCL T-DHW LOWER T-MULTI SENS1	Temperature of the multifunction sensor => Display according to function set for multifunction relay (see left)
BUFFER-T-L	For solid fuel or solar integration => Sensor in storage tank

## SENSOR TEST

Multifunction sensor according to function set for relay

01 = Header pump  
=> T-COLLECTOR = Collector temperature (display only if sensor is connected)

20 = Temperature-controlled circulation pump  
=> T-CIRCL = Temperature of circulation pipe return

21 = Circulation pump via pulse  
=> no temperature display (display with ON/OFF)  
Parameter CHARGE THROUGH at the level Expert –Hot water is activated (=01)  
=> T-DHW LOWER = Temperature of the hot water tank at the inlet area

22 = Integration of the heat generator for solid fuel  
=> SOLID FUEL-T = Temperature of the heat generator for solid fuel,  
=> T-BUFFER LOWER = Temperature of the storage tank at the inlet area

23 = Solar integration  
=> T-COLLECTOR = Temperature of the solar collector,  
=> T-BUFFER LOWER = Temperature of the storage tank in the inlet area

24 = Return flow temperature increase  
=> RETURN TEMP = Return temperature to HS

32 = Heating circuit direct => HEATCIRCUIT 3 (display ON/OFF)  
T-MULTI SENS => Temperature display without function selection

=> without sensor no display (- - - -)



<b>Other entries</b> (General -> Service level) Select value using ☺ => value is displayed	
SOFTWARE NO XXX-XX	Software number with index
BURN TIME 1 ➡	☒ burn time (h) burner 1
BURN START 1 ➡	☒ Burner starts for burner 1
BURN TIME 2 ➡	☒ burn time (h) burner 2
BURN START 2 ➡	☒ Burner starts for burner 2
STL-TEST XX,X°C	Safety temperature limiter test with heat generator temperature display Start with ☒ (hold down)!
SERVICE (only with code no.)	Input of date / operating hours for the yearly maintenance message
RESET USER 00	Load factory settings for user parameters. (Except language)
RESET EXPERT 00 (only with code no.)	Load factory settings for Expert parameters. (Except sensors)
RESET T-PRG 00	Load time program factory settings
RETURN	Exit level using ☒

**SOFTWARE NO XXX-XX**

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

**BURN TIME and BURN START**

☒ => Display of current value ☒ => Return  
☒ hold down until "RESET" display goes off => Reset display

**STL-TEST XX,X°C**

Display of heat generator temperature.  
☒ Hold down prog. button until LIMITER activates  
=> Burner I ON; all pumps OFF; all mixers CLOSE  
The temperature can be observed in the display.




**SERVICE**

Input of values for the yearly maintenance message  
Delete active maintenance display:  
Open control panel cover, press prog. button 2x ☒, set display value to "00" using ☺ and confirm with ☒.  
Delete programmed yearly message:  
At the level General/Service set the value SERVICE => DAY or SERVICE => OPERAT-HRS to dashes.



**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 ☒.

### Display Range

 Hinged cover OPEN → search for level to the right with , open with 

**!** Display only. No adjustments possible.

<b>INSTALLATION</b>	
(HG => heat generator) Select parameter using  => value is displayed	
OUTSIDE TEMP	Outside temperature
HS SET TEMP	HG temperature setting
T-HS	HG flow temperature
RETURN-TEMP	HS return temperature
SOLID FUEL-T	Temperature of the heat generator for solid fuel
COLLECTOR-T	Header temperature
COLLECTOR-T	Temperature of the solar collector
CIRCL TEMP	Return flow temp. of the circulation
CIRCL-PULSE	Circulation via pulse
T-DHW LOWER	Temp. of the hot water tank lower measuring point (see hot water functions)
HEAT CIRCUIT 3	Additional direct heating circuit
MODULATION	Degree of modulation of the HS
BUFFER-T-L	Buffer storage lower temperature
RETURN	Exit level using 

**!** 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 (- - -).

### **OUTSIDE TEMP**

The measured outside temperature is smoothed for control purposes. The smoothed value is displayed here.

### **HG SET TEMP**

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-HS**

Measured actual temperature of the heat generator

### **Temperature of the multifunction relay**

RETURN-TEMP = Return temperature of system

SOLID FUEL-T = Temperature of the heat generator for solid fuel, => T-BUFFER LOWER = Temperature of the storage tank at the inlet area

T-COLLECTOR-H = Collector temperature (display only if sensor is connected)

T-COLLECTOR = Temperature of the solar collector, => T-BUFFER LOWER = Temperature of the storage tank at the inlet area

T-CIRCL = Return temperature of the circulation pipe

CIRCL PULSE = for circulation pump via pulse the pulse input status is displayed (ON/OFF)

DHW-T-LOWER = Temperature of hot water storage tank at inlet area

HEAT CIRCUIT 3 = for additional direct heating circuit the pulse input status is displayed (ON/OFF)

### **MODULATION**


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Display only if a modulating heat generator is connected via BUS that transmits this value

### **BUFFER-T-L**

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For solid fuel or solar integration => Buffer storage tank temperature at the inlet area

Hot water	
RATED DHW-T	Current hot water set temperature according to heating program and operating mode
DHW-TEMP	Current hot water temperature
T-DHW LOWER	Current temperature of HW tank in the lower section (charge-through)
RETURN	Exit level using 

Heating circuit I / II	
DES ROOMTEMP	Current room set temperature according to heating program and operating mode
ROOMTEMP	Current room temperature
RATED POOL-T	Swimming pool temperature setting
POOL-TEMP *)	Current swimming pool temperature
HUMIDITY ***)	Current relative humidity
RATED DHW-T	Hot water temperature setting
DHW-TEMP **)	Current hot water temperature
RATED T-FLOW	Current flow temperature setting
FLOW TEMP	Current flow temperature
N-OPT-TIME	Previous time required to heat up with heat-up optimisation activated
RETURN	Exit level using 

**!** 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 (- - - -).

### T-DHW LOWER

Temperature at lower hot water tank sensor. The value is only displayed if the value "CHARGE-THROUGH" is activated at the level EXPERT => HOT WATER.

### DES ROOMTEMP

If an operator device is connected, there is no display ("- - - -") in the controller => Value is displayed in the operator device

### ROOMTEMP (room temperature)

Only if a sensor or an FBR is connected.

\*) These values only appear if the heating circuit is programmed for regulating a pool.

) These values only appear if the heating circuit is programmed as a hot water circuit.

\*\*\*) This value is only displayed if an operator device is connected and the parameters have been set for the corresponding heating circuit.

"- - - -", => no humidity sensor available in operator device

## User Area

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

<b>INSTALLATION</b>			
All settings that <u>cannot</u> 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	- - - -	
SELEC-PROG	Heat circuit 1, HC 2	1	
RETURN	Exit level using		

\*) **IV** = Internal Values:

Space for entering the parameters stored in the system!

Hinged cover OPEN → search for level to the right with ,  
 open with

### **GERMAN => Language**

Select controller language

### **CONTRAST**

Adjust intensity of display

### **DISPLAY SEL**


Select additional display in standard operation

- - - - => no additional display of  
 DAY => Week day (Mon, Tue, Wed, ....)  
 OUTSIDE TEMP => Outside temperature  
 T-FLOW 1 => Flow temperature heating circuit 1  
 T-FLOW 2 => Flow temperature heating circuit 2  
 HW-T => Hot water temperature (upper)  
 T-HS => Heat generator temperature  
 T-ROOM 1 => Room temperature heating circuit 1=> \*)  
 T-ROOM 2 => Room temperature heating circuit 2=> \*)

\*) only if remote control is connected

### **SELEC-PROG**

Select heating circuit whose heating program is shown in the standard display.

Hot water			
Designation	Value range	Default	IV
1X DHW	00, 01 (OFF/ON)	00 = OFF	
DHW-TEMP 1	10°C - 70°C	60°C	
DHW-TEMP 2	10°C - 70°C	60°C	
DHW-TEMP 3	10°C - 70°C	60°C	
BOB-VALUE	0K – 70K	0 K	
CIRCL-P-DHW	00, 01 (OFF/ON)	00 = OFF	
ANTILEGION	00, 01 (OFF/ON)	00 = OFF	
RETURN	Exit level using 		




### Hot water short time heating function

ANTILEGION = 01 => Every 20th time that heating takes place or once per week on Saturday at 01:00 hrs the storage tank is heated up to 65°C.

It is possible to set up your own hot water short time heating function using the third hot water enable facility.

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

01 => The storage tank is enabled for charging once (e.g. for showering outside hot water times).

 Hinged cover OPEN → search for level to the right with , open with 

Charging starts when the temperature drops below set temperature "DHW-TEMP 1" by the switching hysteresis. After charging, the value is automatically set to "00".

#### DHW-TEMP 1-3 (Hot water temperature setting)

Required hot water temperature setting  
 DHW-TEMP 1 => used in first enable time,  
 DHW-TEMP 2 => used in second enable time,  
 DHW-TEMP 3 => used in third enable time of hot water program.

#### BOB-VALUE (Operation Without Burner)

Energy saving function for solar or solid fuel integration. For settings > "0" the burner is not activated for hot water preparation until the hot water temperature has dropped below the temperature setting by the set value + the hysteresis.

!







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




#### CIRCL-P-DHW (Circulation with hot water)

01 => The circulation pump runs when the hot water is enabled, but the circulation program is disabled.

#### ANTILEGION (Hot water short time heating function)

01 => Activation of hot water short time heating function



Heating circuit I / II			
Designation	Value range	Default	IV
MODE	---- ,  ,  ,  ,  , 	----	
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	
ECONO TEMP*)	5°C - 40°C	10°C	
REDUCED TEMP	5°C - 40°C	15°C	
T-LIMIT DAY	----, (-5)°C–40°C	19°C	
T-LIMIT N	----, (-5)°C–40°C	10°C	
HEAT SLOPE	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	0,0 K	
OPTIMIZAT	00, 01, 02	00	
M-OPT-TIME	0:00 – 3:00 [h]	2:00 [h]	
ECONO OPTI	0:00 – 2:00 [h]	0:00 [h]	
PC-ENABLE	0000 - 9999	0000	
RETURN	Exit level using 		

 Hinged cover OPEN → search for level to the right with ,  
open with 

\*) depending on function selector Heating circuit POOL-TEMP, DHW-TEMP, T-FLOW-DAY or T-FLOW-NIGHT (see page 43)

### MODE

---- => The controller programming switch applies in this case.

When setting an operating mode the mode only applies to the assigned heating circuit. When the " = Standby/OFF", and " =

Summer mode" controller programming switch operating modes are set, this has a reducing effect on all heating circuits and consumer circuits in the entire system.

### 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.

### ECONO TEMP

Required room temperature setting during night reduction

### REDUCED TEMP

Required room temperature setting during holidays

**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")

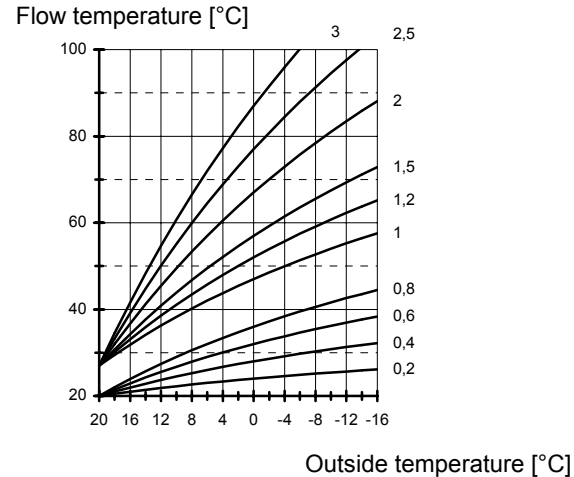
**HEAT SLOPE**

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.



**Guideline values**

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

**ADAPTION (heat slope adaption)**

Only active if an FBR analogue room device is connected (room sensor + operating mode selection) and an outdoor sensor.

Function for automatic heat slope setting

Starting Conditions:

- External temperature < 8°C
- Operating mode is automatic (I or II)
- Duration of lowering phase at least 6 hours

At the beginning of the lowering period, the current room temperature is measured. During the next four hours, this temperature is used as the set point for the room regulator. The heating curve is calculated from the values determined during this time by the regulator for the flow pipe nominal temperature and the external temperature.

**!** If the adaptation is interrupted, e.g. by a start-up discharge or the hot water demand from an external heating circuit, then the warning triangle will appear in the display until the function is carried out successfully the next day or is ended, e.g. by adjusting the operating mode switch.

**!** During the adaptation, the water heating and the heating optimisation of the regulator are blocked.

**ROOMS-INFL (Room sensor influence)**

Only active if an FBR analogue room device is connected (room sensor + operating mode selection).

The heat generator 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 heat generator 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)**

For room control (e.g. with FBR), the measurement can be corrected by means of this setting should the room sensor not measure correctly.

### **OPTIMIZAT (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 \*)

\*) Only active if an FBR analogue room device is connected (room sensor + operating mode selection).

**!** 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 "OPTIMIZAT = 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.



**Timer Program Area**






All the time programs can be set in this area.

 Hinged cover OPEN → search for level to the right with ,  
open with 

**List of available time programs**


With maximum controller configuration


Select timer program using   select timer program for display or adjustment



CIRCL TIME	Switching program for circulation pump
HOTW-PROG	Enabling program for hot water charging pump
HEAT-PROG 1  1	1. heating program for first controller heating circuit
HEAT-PROG 2  1	2nd heating program for first controller heating circuit
HEAT-PROG 1  2	1. heating program for second controller heating circuit
HEAT-PROG 2  2	2nd heating program for second controller heating circuit
RETURN	Exit level using 

**Selecting a timer program**

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

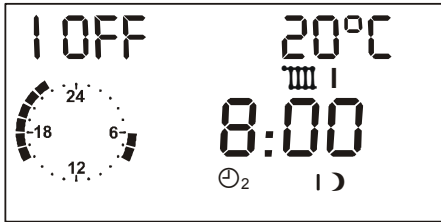
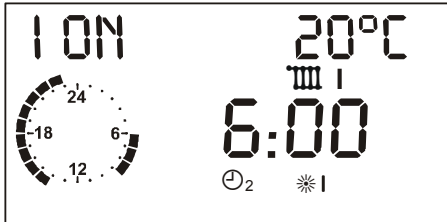
 to the right until clock  
=> "USER => INSTALLATION",

 to the right until clock => "TIME PROGRAM  
=> CIRCL TIME"

 Select timer program  
=> e.g. "HEAT-PROG 2  1"  
= Heating program 2 for controller heating circuit 1

 Confirm/open timer program  
=> "MONDAY"

When connecting a digital room controller with heating program input, the corresponding heating program in this controller is automatically faded out.



### 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 1 = 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

## 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" Second switch-on 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.

**Heat circuit 1**

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 So.: 07:00 to 23:00


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

**Heat circuit 2**

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 So.: 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 So.: 06:00 to 22:00

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

## Circulation

Factory setting:

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

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




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

**Expert area**

These settings can only be changed if the code no. is entered (see page 15).












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

INSTALLATION			
Designation	Value range	Default	IV
CODE-NO	0000 - 9999	Entry	
CODE-NO (Adjustment)	0000 - 9999	0000	
BUS ID HS1	00 - 08	00	
BUS ID 1	(- - - -,00), 01-15	01	
BUS ID 2	(- - - -), 02-15	02	
BUS TERMINATION	00, 01 (OFF/ON)	01 (0631) 00 (1121)	
AF SUPPLY	00,01	01 = ON	
TIME MASTER	00, 01	00 = OFF	
T-HS MAX	30°C - 110°C	85°C	
MIN T-HS	10°C - 80°C	40°C	
WARM-UP-T	10°C - 85°C	35°C	
MIN-DELIMI	00, 01, 02	00	
See following pages for continuation			

 Hinged cover OPEN → search for level on right with , open with 

**CODE-NO**

Entering the code number (see page 15) allows all of the expert settings to be modified => including the code number itself (first parameter)

( on right => CODE-NO 0000  =>  1st digit  =>  2nd digit  =>  3rd digit  =>  4th digit  => )

**BUS ID HS1**

For cascades, the HS are numbered beginning with "01". ("00" = Single boiler)

**BUS ID1 / 2** (heating circuit number)

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

**BUS TERMINATION**

This parameter is used to switch the terminal resistance for Can communication. The entire system may contain exactly one terminating resistor.

Delivery state:

- Mixer controller (1121) => "0"
- Boiler controller (0631, 0321,...) => "1".

(Parameter BUS ID HS1 > 00 => Bus terminator = 00)

△ When loading the factory settings, the terminal resistance is newly set (according to boiler sensor).

### **AF SUPPLY (Outdoor sensor power supply)**

Switching off the power supply to the outdoor sensor. Switching off allows up to 5 controllers to be operated with a single outdoor sensor. The power supply must only be switched on if there is one controller per sensor = "01".

### **TIME MASTER**

(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!

### **MAX T-HS (Maximum heat generator temperature)**

- Protects the heat generator from overheating / prevents triggering the LIMITER.
- Limiting the heat generator temperature to save energy.

**!** Caution: Also works with hot water preparation.

### **MIN T-HS (Minimal heat generator temperature)**

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 tempera-

ture has been reached  
MIN T-HS+ HYSTERESIS  
(also see MIN-DELIMI).

### **WARM-UP-T (Warm-up relief)**

Reduces operation in condensation zone. The circulation pumps are switched off and the mixers are shut until the heat generator has reached the start-up temperature. (This function is cancelled after 30 minutes)

### **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.



Installation			
Designation	Value range	Default	IV
HYSTERESIS	5K – 20K	5 K	
HYST TIME	00min – 30min	00 min	
DELAY ST	00min – 30min	00 min	
HYST BURNER 2	2K – 20K	2 K	
SEQ CHANGE	0h – 250h	0h	
Cooling function			
WE COOL FCT	00 – 01	00	
T-HS COOL	30°C - 120°C	95°C	
See following pages for continuation			

### HYSTERESIS (dynamic switching hysteresis)

#### HYST TIME (Hysteresis time)

Function for optimising heat generator operation with differing heat generator loads.

The effective switching hysteresis is reduced linearly after the burner is switched on from the set HYSTERESIS to the minimum hysteresis (5K) during the hysteresis time "HYST TIME".

#### Low heat consumption

If the system consumes little heat, the heat generator quickly reaches the set temperature. In this case the

higher HYSTERESIS setting takes effect. Short run-times and frequent burner operation are prevented.

#### High heat consumption

During longer periods of burner operation (high heating load) the hysteresis is automatically reduced to 5K. This prevents the heat generator from heating to unnecessary high temperatures. The energy consumption of the heating system is optimised.

**!** The set value of "00" produces a constant hysteresis value.

#### Operation with two-stage heat generators or with 2 heat generators

#### 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.

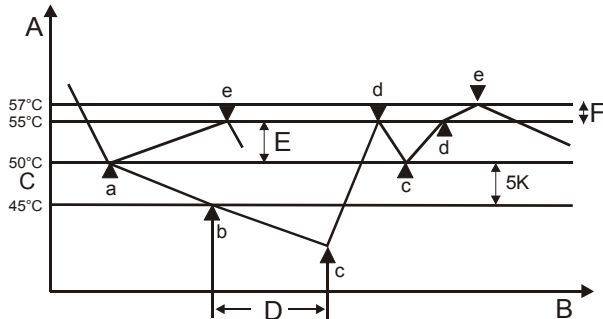
#### Switch on the 2nd burner stage

- 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]



- A Temperature of the heat generator
- B Time
- C Set temperature of the heat generator
- D DELAY ST (blocking time 2. burner stage)
- E HYSTERESIS (dynamic switching hysteresis)
- F HYSTERESIS 2 (hysteresis for 2nd heat generator)

- a Stage 1 on
- b Start of blocking time

- c Stage 2 on (stage 2 enable)
- d Stage 2 off
- e Stage 1 off (cancel stage 2 enable)

### **SEQUENCE CHANGE**(time for switching HS)

Only for operation with two heat generators.

The controller can be optionally used for controlling heating systems with two-stage burners or heating systems with two single-stage heat generators. For operation with two heat generators, there is the option to switch the HS sequence after the number of operating hours set here for the current heat generator "1".

### **HS COOL FCT** (Cooling function for the heat generator)

### **T-HS COOL** (Start temperature for cooling)

- △ Applies to 1st heat generator or the solid fuel boiler (multifunction relay 1)!

If the cooling function for the heat generator is activated (HS COOL FCT = 01), the heating circuits are put into operation with T-FLOW MAX (if cooling function permitted in HC) as soon as the set starting temperature T-HS COOL is exceeded by one of the heat generators. The cooling function is stopped when the temperature drops below the start temperature T-HS COOL by 5K.

<b>Installation</b>			
<b>Designation</b>	<b>Value range</b>	<b>Default</b>	<b>IV</b>
RELAY FUNC 1	00 - 32	01	
RELAY-TEMP 1	30°C - 90°C	30°C	
HYST RELAY1	2K – 10K	5 K	
RELAY FUNC 2	00 - 06	02	
See following pages for continuation			

### Auxiliary relay functions

The sensor  $\uparrow$  1 (connector VIII, pin 1+2) is assigned to the relay  $\uparrow$  1 (temperature-controlled) (also see page 16). If a further sensor is required for a function, this sensor must be connected to connector III, pin 2+3.

Functions which do not require a sensor are assigned to relay  $\uparrow$  2 (timer-controlled).

#### **RELAY FUNC 1** (function selection relay 1)

**!** If the parameter "CHARGE-THROUGH" is activated at the level EXPERT=>HOT WATER, the additional functions with sensor integration are not possible (function 20 – 32)

#### **T-RELAIS 1** (Switching temperature relay 1)

#### **HYST RELAYS 1** (Hysteresis relay 1)

#### **00 = no function**

#### **01 = Header pump**

ON: When heat is requested by a consumer

OFF: Without consumer heat request

If at least one consumer in the system requests heat the pump is switched on. The after-run function is effective after the heat generator is switched on.

#### **02 = Circulation (time)**

The circulation pump is switched on according to the circulation or hot water program (parameter "CIRCL-P-DHW" at the level USER=>HOT WATER).

#### **03 = Booster pump**

ON: In the event of a heating request from an internal consumer

OFF: Without internal consumer heating request A pump after-run occurs.

#### **05 = Pump heat generator 1**

When using the controller to control two heat generators the relay may be used to control the heat generator pump for heat generator 1.

(Relay switches with burner relay 1; run-down =5 min)

#### **06 = HS pump heat generator 2**

When using the controller to control two heat generators the relay may be used to control the heat generator pump for heat generator 2.

(Relay switches with burner relay 2; run-down =5 min)

**20 = Temperature-controlled circulation pump**

CIRCL TEMP = Return flow temperature of circulation line

ON:  $T\text{-CIRCL} < T\text{-RELAY1}$

OFF:  $T\text{-CIRCL} > [T\text{-RELAY1} + \text{HYST RELAY1}]$

The circulation pump is switched on when the return flow temperature drops below the set limit temperature (T-RELAY 1). The pump is switched off again when the return flow temperature exceeds the set limit temperature by the Hysteresis (HYST RELAY1).

The set circulation program and the "Circulation with hot water" setting have an overriding function

=> Switching on only takes place during enable periods.

**21 = Pulsed circulation pump**

ON: In the event of short circuit at multifunction sensor input

OFF: After 5 minutes

If a short-cut occurs at the multifunction sensor input the circulation pump is switched on for 5 minutes. Switching on takes place on the edge (once only).

The set circulation program and the "Circulation with hot water" setting have an overriding function

=> Switching on only takes place during enable periods.

**22 = Integration of the heat generator for solid fuel**

SOLID FUEL-T = Temperature of the heat generator for solid fuel

BUFFER-T-LOW = Temperature of the storage tank at the inlet area (connector III, pin 2+3)

ON:  $\text{SOLID FUEL-T} >$

$[\text{BUFFER-T-LOW} + \text{HYST RELAY 1} + 5\text{K}]$

OFF:  $\text{SOLID FUEL-T} <$

$[\text{BUFFER-T-LOW} + \text{HYST RELAY 1}]$

Start-up relief:

ON:  $\text{SOLID FUEL-T} > T\text{-RELAY 1}$

OFF:  $\text{SOLID FUEL-T} < [T\text{-RELAY 1} - 5\text{K}]$

The pump is switched on when the temperature of the heat generator for solid fuel exceeds the temperature of the buffer storage at the inlet area (BUFFER-T-LOW) by the hysteresis (HYST RELAY1 + 5K). Switching off occurs when the temperature drops 5K below the switch-on temperature.

Switching off additionally occurs when the temperature of the heat generator for solid fuel drops below the set limit temperature

(T-RELAY1) by 5K. The pump is enabled again when the temperature of the heat generator for solid fuel exceeds the set limit temperature

(T-RELAY1).

Disabling the HS1:

ON:  $\text{SOLID FUEL-T} + 5\text{K} > \text{SET HS-T}$  and solid fuel boiler pump  
= ON

OFF: SOLID FUEL-T < SET HS-T or solid fuel boiler pump  
= OFF

**!** Disabling the HS1 only occurs if the solid fuel boiler is integrated in the HS1 controller.  
If the cooling function is activated, it will also affect the solid fuel boiler function.

### 23 = Solar integration

T-COLLECTOR = Temperature of the solar collector  
BUFFER-T-LOW = Temperature of the storage tank at the inlet area (connector III, pin 2+3)

ON: T-COLLECTOR >  
[BUFFER-T-LOW + HYST RELAY 1 + 5K]

OFF: T-COLLECTOR <  
[BUFFER-T-LOW + HYST RELAY 1]

The pump is switched on when the temperature of the solar collector exceeds the temperature of the buffer storage at the inlet area (BUFFER-T-LOW) by the hysteresis (HYST RELAY1 + 5K). Switching off occurs when the temperature drops 5K below the switch-on temperature.

#### Safety / system protection:

OFF: T-PUFFER-T-LOW > T- RELAY1

ON: BUFFER-T-LOW < [T- RELAY 1 – 5K]

Switching-off occurs when the temperature of the storage tank at the inlet area exceeds the set limit temperature

(T-RELAY1). The pump is enabled again when the storage tank temperature drops below the limit temperature by 5K.

### 24 = return flow temperature increase

RETURN-TEMP = Return temperature of system

ON: RETURN TEMP < T- RELAY1

OFF: RETURN TEMP > [T- RELAY 1+ HYST RELAY 1]

The return flow temperature increase pump is switched on if the return flow temperature drops below the set limit temperature (T-RELAY1). It is switched off again when the return flow temperature exceeds the set limit temperature by the Hysteresis (HYST RELAY1).

### 32 = Direct heating circuit

Is activated by means of a short circuit at the sensor input of relay 1 and switches the heating circuit pump ON. There is an after-run after the sensor short circuit is cancelled.

The HS obtains a set temperature value from the parameter "T-RELAY 1".

### RELAY FUNC 2 (function selection relay 2)

#### 00 = no function

#### 01 = Header pump

ON: When heat is requested by a consumer

OFF: Without consumer heat request

If at least one consumer in the system requests heat the pump is switched on. The after-run function is effective after the heat generator is switched on.

### **02 = Circulation**

Switching the relay according to the circulation program

### **03 = Booster pump**

ON: In the event of a heating request from an internal consumer  
OFF: Without internal consumer heating request A pump after-run occurs.

### **05 = Pump heat generator 1**


When using the controller to control two heat generators the relay may be used to control the heat generator pump for heat generator 1.

(Relay switches with burner relay 1; run-down =5 min)


### **06 = Pump heat generator 2**

When using the controller to control two heat generators the relay may be used to control the heat generator pump for heat generator 2.

(Relay switches with burner relay 2; run-down =5 min)

Installation		
Designation	Value range	Default
SCREED	00, 01 (OFF/ON)	00 = OFF
SCREED PROGR	See explanation!	
RETURN	Exit level using 	

**!** Start day is not included:  
The screed program starts with the "Day 1" temperature setting and switches to "Day 1" at 00.00 hrs and then to the next day at 00.00 hrs and so on. The current day is marked with an "x" in the "SCREED PROGR" program.

**!** After the function has been cancelled/terminated the controller continues heating using the set operating mode. If no heating is required, set the operating mode to  = Standby / OFF.

### Screed program

#### **SCREED** (activation of screed drying process)

The screed program can be used for function heating in accordance and for heating freshly laid screed ready for flooring.

**!** The screed drying process can only be performed for the mixer circuits of the HS controller.




After starting, the program runs through the set flow temperatures. The integrated mixer circuits control to the set flow temperature. The heat generator provides this temperature irrespective of the operating mode that has been selected. This is marked in the standard display by the entry "SCREED" and a display of the current flow temperature.


The freely adjustable program runs for a maximum of 28 days. The flow temperatures can be set to a value of between 10°C and 60°C for each day. The entry "----" stops the program (also during operation for the following day).

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
VT	25	25	25	55	55	55	55	25	40	55	55	55	55	55	55	55	55	55	55	40	25	---	---	---	---	---	---	---
=>																												

### **SCREED PROGR (Program setting)**




 => Screed program;  Select day;  => Activate adjustment date;  Set flow temperature;

 => Save setting;  Select next day or exit screed program using "RETURN" + .

Hot water			
Designation	Value range	Default	IV
CP LOCK	00, 01 (OFF/ON)	01 = ON	
PARALLEL	00, 01, 02, 03	01	
HS-T DHW	00K – 50K	20 K	
HYST DHW	5K – 30K	5 K	
DHW FOLLOWUP	00 min – 30 min	00 min	
THERM INPUT	00, 01 (OFF/ON)	00 = OFF	
WALL HUNG	00, 01 (OFF/ON)	00 = OFF	
CHARGE THROUGH	00, 01 (OFF/ON)	00 = OFF	
RETURN	Exit level using 		

### **CP LOCK**(Charge pump lock)

The charging pump is not switched until the heat generator temperature exceeds the storage tank temperature by 5K. It is switched off when the heat generator temperature drops below the storage tank temperature. This prevents the storage tank from being cooled by the heat generator when hot water preparation starts.

 Hinged cover OPEN → search for level to the right with , open with 

### **PARALLEL** (Pump parallel running)

00 => **Hot water priority operation**: The heating circuits are blocked during hot water preparation. The mixers close and the heating circuit pumps switch off.

01 => **HW partial priority**: The heating circuits are blocked during hot water preparation. The mixers close and the heating circuit pumps switch off. The mixer circuits are enabled again when the heat generator has reached the temperature of hot water set temperature + heat generator superheating [DHW-TEMP + HS-T DHW]. If the heat generator temperature drops below the enable temperature by the switching hysteresis [HYST DHW], the mixer circuits are blocked again.

02 => **Pump parallel running**: Only the direct heating circuits are blocked during hot water preparation. The mixer circuits continue to be heated. The hot water preparation is extended by this function.

03 => **Pump parallel running also for the direct heating circuit**: During hot water preparation all heater circuits continue to be heated. The hot water preparation is extended by this function. When the heat generator temperature exceeds the maximum flow temperature of the direct heating circuit by 8K, the heating circuit pump for this circuit is swit-



ched off (overheating protection). The heating circuit pump has already been switched on again when the heat generator temperature drops below the temperature [maximum flow temperature + 5K].

### 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.

### HYST DHW (Hot water charging hysteresis)

Hot water preparation is started when the temperature of the hot water storage tank drops below the temperature setting by the hysteresis [HYST DHW]. The hot water preparation stops when the storage tank reaches the temperature setting (the temperature setting is set to 65°C during hot water short time heating operation).

### DHW FOLLOWUP (pump run-down time)

00 min => Standard function: The charging pump continues to run for 5 minutes after the burner has switched off. If heat is requested by a heating circuit the run-down is cancelled.

The charge pump blocking kicks in and can also cause the run-down function to be cancelled.

greater than 00 min => The charge pump runs down by the set time when storage tank charging is complete. The after-run can only be cancelled by means of the activated charge pump blocking.

### THERM INPUT (storage tank with thermostat)

00 => Hot water preparation via storage tank sensor

01 => Hot water preparation via thermostat:  
The hot water preparation is started by a short circuit at the storage tank sensor connecting terminals. It stops when the short circuit is removed.

### WALL HUNG (for modulating HG)

Heat generator set temperature during hot water preparation = Storage tank actual temperature + HS-T DHW

With this function the exhaust gas losses occurring during hot water preparation can be reduced with modulating heat generator using the adapted heat generator set temperature.

### CHARGE THROUGH

DHW-TEMP = Temperature of hot water storage tank at outlet area

Storage tank charging:

ON: DHW-TEMP < RATED DHW-T - HYST DHW OFF  
DHW-T-LOWER > RATED DHW-T

Charging the storage tank is stopped when the storage tank set temperature is measured at the lower sensor.

**!** If this function is activated, the auxiliary functions with sensor integration ("EXPERT => SYSTEM", parameter "RELAY FUNC 1" => 20-32) are not possible

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

heating circuit I / II			
Designation	Value range	Default	IV
HC FUNCTION	00 - 04	00	
PUMP MODE	00 - 03	00	
MIXER OPEN (not for HW circuit)	5-25	18	
MIXER CLOSE (not for HW circuit)	5-25	12	
See following pages for continuation			

### HC FUNCTION (heating circuit function selection)

If this parameter is modified the controller is restarted. "RESET" briefly appears in the display.

**!** The special functions (02, 03, 04) must be configured for heating circuit 2 if a normal heating circuit (00, 01) is additionally used in the device.

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 tempera-

ture [T-FLOW-DAY], and during reduced mode operation with a fixed preset flow temperature [T-FLOW-NIGHT] accordingly.

02 => Swimming pool control (only for heating circuit II)

This function can be used to heat a swimming pool. The mixer controls the flow temperature for the swimming pool heat exchanger. The swimming pool water temperature sensor is connected to the room sensor connection for the heating circuit (see FBR).

[Plug III; 1+2]

The flow temperature control operates like normal room control [ROOMS-INFL].

The set value for the water temperature can be entered in the user area of the associated heating circuit level [POOL-TEMP 1/2/3]. The heating program operates. No heating takes place during the reduction period (frost protection only).

The water temperature and the current set value are displayed in the display level [POOL-TEMP/RATED POOL-T].

03 => Hot water circuit

This function can be used to operate additional hot water circuits. The heating circuit flow sensor is located in the hot water storage tank.

The hot water temperature set value can be entered in the user area of the associated heating circuit level [DHW-TEMP 1/2/3]. The heating program for heating circuit acts

as an enable program for the storage tank. The storage tank set value is set to 10°C during the reduction period. The heat generator controller's hot water priority function can be used (partial priority acts like priority).

### 04 => Return flow temperature increase via mixer motor

The heating circuit flow sensor is used as a heat generator return flow sensor. The mixer motor controls to the heating circuit set value for 24 hours [MIN-FLOW-T].

**Installation tip:** Mixer motor OPEN => heat generator flow is fed into the return (=> return flow temperature increase) Mixer motor CLOSED => heating circuit return is passed through. When the mixer motor is open, it must be ensured that there is circulation through the heat generator (heat generator pump).

### **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.

### 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.

### **MIXER OPEN** (mixer dynamics when opening)


Speed setting at which the mixer motor opens when a control difference occurs. The control difference at which the mixer motor opens without interruption is entered in Kelvin.

**!** Small values cause the mixer motor to adjust quickly and can lead to oscillation.

### **MIXER CLOSED** (Mixer dynamics when closing)

Speed setting at which the mixer motor closes when a control difference occurs. The control difference at which the mixer motor closes without interruption is entered in Kelvin.

**!** Small values cause the mixer motor to adjust quickly and can lead to oscillation.

Heat circuit I/II			
Designation	Value range	Default	IV
MAX FLOW-T	20°C - 110°C	80°C	
MIN FLOW-T	10°C - 110°C	10°C	
FROST PROT	----; (-15)°C – (5)°C	0°C	
OUT-TEMP-DEL	0:00 – 24:00	0:00	
SLOPE OFFSET	0K – 50K	5 K	
B-HEAT SINK	00, 01 (OFF/ON)	01 = ON	
RETURN	Exit level using 		

### **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 heating circuit pump of the direct heating circuit is only switched off if the temperature of the heat generator exceeds the maximum flow temperature by 8K. The heating circuit pump is switched on again when the temperature of the heat generator 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).

### **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 heat generator temperature that is required for a mixer circuit is calculated by adding the calculated temperature setting for the heating circuit flow to the heating slope 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.

## **Part 3: General function description**

### **Heat circuit control**

#### **Weather-dependent control**

The heat generator 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 programmed hot water temperature is stabilised by switching the hot-water cylinder charging pump and the burner. Storage tank charging starts when the storage tank temperature drops below the temperature setting by 5K. Storage tank charging stops when the temperature setting is reached.

### **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 heat generator

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

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

### Heat generator frost protection

The heat generator frost protection is activated when the heat generator temperature drops below 5°C. The heat generator is switched on until the heat generator temperature exceeds the "MINIMUM HEAT GENERATOR TEMPERATURE".

### Flow or storage tank sensor frost protection

The sensor frost protection is activated when the flow or storage tank temperature drops below 7°C. Only the relevant pump is switched on.

The sensor frost protection is deactivated when the flow or storage tank temperature increases to above 9°C.

### 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 heat generator

### **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  $\triangle$  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.

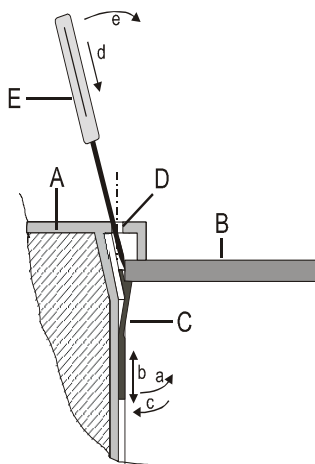
### **Pump blocking protection**

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 h ours 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.



**Part 4: Installation and Start-up****Installation****Assembly / Dismantling****Sketch showing basic mode of operation:**

- A Controller, side view, cutaway view
- B Control panel plate
- C Mounting clamp
- D Unlocking holes (see Chapter Changing set values)
- E Sharp-pointed tool

**Installing the controller:**

1. Set the mounting clamp to the wall thickness of the control panel (at the left and right-hand side of the unit):
  - a. Pull the mounting clamp at the low away from the controller wall (toothing).
  - b. In this condition, slide the mounting clamp down or up until the distance from the edge of the unit corresponds to the thickness of the control panel wall.  
Detent position 1  $\cong$  0.5-1.0 mm wall thickness  
Detent position 5  $\cong$  5.0 mm wall thickness
  - c. Press the mounting clamp against the controller wall at the low.

2nd Press the controller into the control panel recess and check that it is firmly secure. If the controller wobbles: Remove the controller and move the mounting clamps up.

### **Removing the controller:**

- ⚠ Disconnect the unit from the power supply before removing it.
- d) Insert a sharp-pointed tool at an angle with respect to the exterior wall into one of the unlocking holes (the tool must be slid between mounting clamp and control panel wall).
- e) Lever the tool with respect to the unit exterior wall. This causes the mounting clamp to release the control panel wall.

Raise the unit slightly at the corresponding side and repeat the procedure on the other side of the unit.

The unit can now be removed.

### **Connecting instructions**

- ⚠ The controller is designed for an operating current of 230 V AC at 50 Hz. The burner contact is potential-free and must always be connected in series with the mechanical boiler thermostat (if present).
- ⚠ **Attention:** Bus lines and sensor lines must be laid separately, away from mains cables!
- ! After connecting or modifying the connections of sensors and remote controls the controller must be briefly switched off (mains switch/fuse). The function

of the controller is reconfigured in accordance with the connected sensors the next time the controller is switched on.

### **Note for installation in connection with digital room device**

When installing a digital room device, the heating circuit-specific set values are adjusted at the room device. These values are automatically faded out inside the controller.

- ! If during operation the digital room device is separated from the BUS for a longer time period (>5min), the heating controller will continue to work with its own set values.

In order to avoid damages in case of errors - for deviations from relevant set values (such as maximum flow temperature for floor heaters) - we suggest the following procedure:

1. Installing the new heating controller
2. Set all values for heating controller
3. Install one digital room device
4. Set all values for digital room device

### System diagram

#### Maximum configuration:

HS regulation (2-stage)

Hot water generation

2 mixed heating circuits, remote-controlled via BUS or

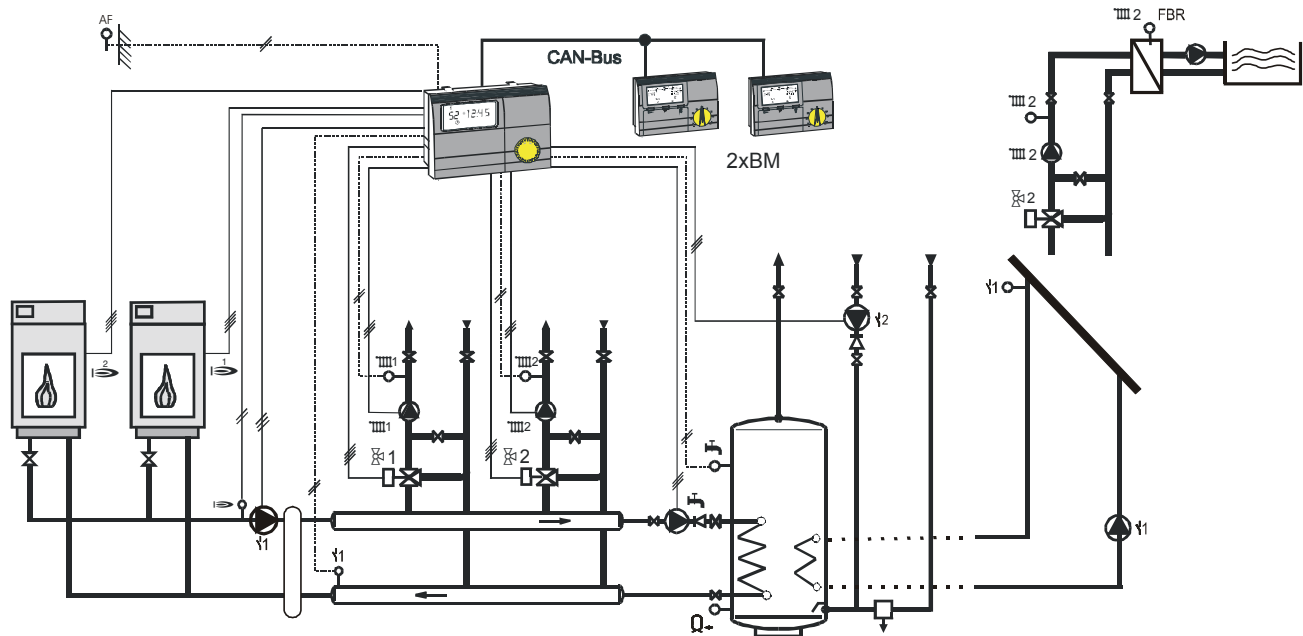
1 mixed heating circuit & Fixed value / Pool regulation

Return increase/Solar/Solid fuel

Circulation pump

!

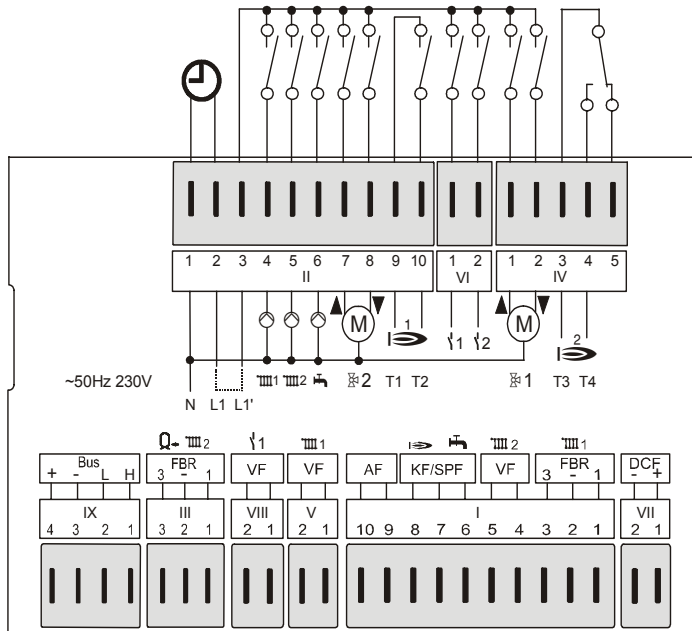
Depending on controller type, only partial functions are assigned for your controller.



**Electrical connection**

**Version 1**

230V~; Relay switching capacity 2(2)A, 250V~



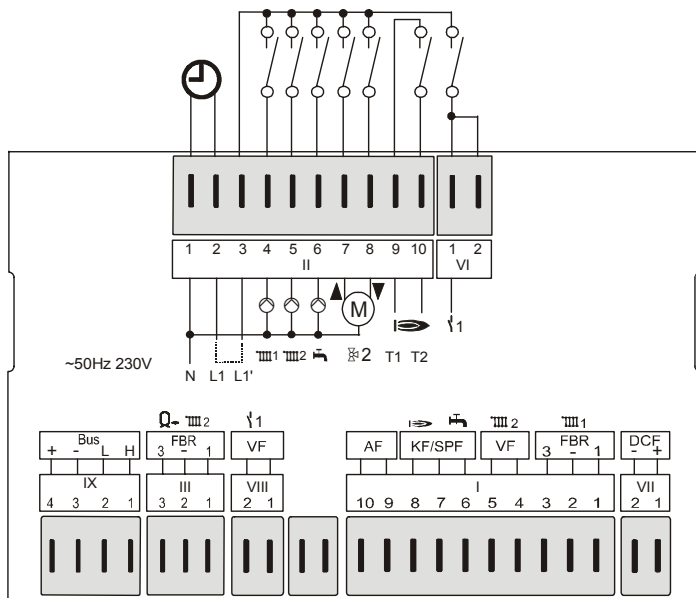
Displayed connection is the maximum version E8.0631

**Terminal wiring**

- VII (1+2): DCF Antenna
- I (1-3): FBR2 (FBR1) for heating circuit 1
- I (4+5): Flow sensor, heating circuit 2
- I (6+7): Storage tank sensor
- I (7+8): Boiler sensor
- I (9+10): Outdoor sensor
- V (1+2): Flow sensor, heating circuit 1
- VIII (1+2): Sensor multifunction relay 1
- III (1-3): FBR2 (FBR1) for heating circuit 2
- III (2+3): Lower buffer sensor
- IX (1+2): Data line CAN bus
- IX (3+4): Power supply CAN bus
- II (1): Neutral conductor, mains
- II (2): Power supply, unit
- II (3): Power supply, relay
- II (4): Pump, heating circuit 1
- II (5): Pump, heating circuit 2
- II (6): Storage tank pump
- II (7): Mixer open, heating circuit 2
- II (8): Mixer closed, heating circuit 2
- II (9+10): Burner stage 1 / heat generator 1
- VI (1): Multifunction relay 1
- VI (2): Multifunction relay 2
- IV (1): Mixer open, heating circuit 1
- IV (2): Mixer closed, heating circuit 1
- IV (3+4): Burner stage 2 / heat generator 2

**Version 2**

230V~; Relay switching capacity 2(2)A, 250V~



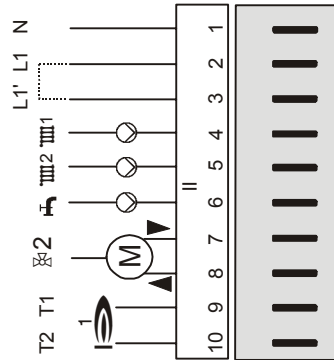
**Terminal wiring**

- VII (1+2): DCF Antenna
- I (1-3): FBR2 (FBR1) direct heating circuit
- I (4+5): Flow sensor mixer circuit
- I (6+7): Storage tank sensor
- I (7+8): Boiler sensor
- I (9+10): Outdoor sensor
- VIII (1+2): Sensor multifunction relay 1
- III (1-3): FBR2 (FBR1) for mixer circuit
- III (2+3): Lower buffer sensor
- IX (1+2): Data line CAN bus
- IX (3+4): Power supply CAN bus
- II (1): Neutral conductor, mains
- II (2): Power supply, unit
- II (3): Power supply, relay
- II (4): Boiler circuit pump
- II (5): Pump, mixer circuit
- II (6): Storage tank pump
- II (7): Mixer OPEN
- II (8): Mixer CLOSED
- II (9+10): Heat generator/Burner
- VI (1 / 2): Multifunction relay 1

Displayed connection is the maximum version E8.0321

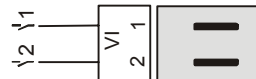
Power terminal assignments

Plug 2 [III]



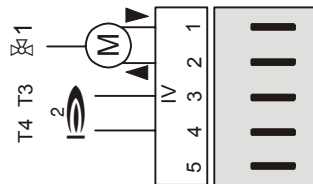
- N: Neutral conductor, mains
- L1: Power supply, unit
- L1': Power supply to relay
- HK 1: heating circuit pump HK 1
- HK 2: heating circuit pump HK 2
- Storage tank charging pump
- Mixer open, heating circuit 2
- Mixer closed, heating circuit 2
- Burner stage 1
- Burner stage 1

Plug 6 [VI]



- Multifunction relay 1
- Multifunction relay 2

Plug 4 [IV]



- Mixer open, heating circuit 1
- Mixer closed, heating circuit 1
- Burner stage 2
- Burner stage 2
- No function

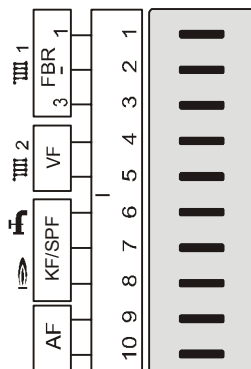
## Sensor terminal assignments

### Connector 7 [VII]



Pin 1: DCF  
Pin 2: DCF (Ground)

### Connector 1 [I]



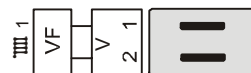
Pin 1: FBR heating circuit 1 (room sensor)  
Pin 2: FBR heating circuit 1 (ground)  
Pin 3: FBR heating circuit 1 (set value/operating mode)

Pin 4: Flow sensor, heating circuit 2 (ground)  
Pin 5: Flow sensor, heating circuit 2

Pin 6: Waste water sensor  
Pin 7: Waste water and boiler sensor (ground)  
Pin 8: Boiler sensor

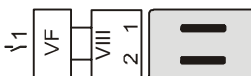
Pin 9: Outdoor sensor (ground)  
Pin 10: Outdoor sensor

### Connector 5 [V]



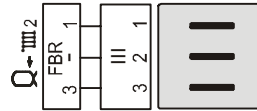
Pin 1: Flow sensor, heating circuit 1 (ground)  
Pin 2: Flow sensor, heating circuit 1

### Connector 8 [VIII]



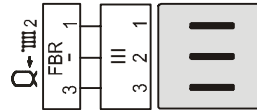
Pin 1: Sensor, multifunction relay I 1 (ground)  
Pin 2: Sensor multifunction relay I 1

## Connector 3 [III] (without solar integration)



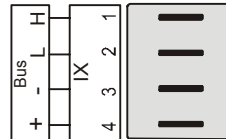
- Pin 1: FBR heating circuit 2 (room sensor)
- Pin 2: FBR heating circuit 2 (ground)
- Pin 3: FBR heating circuit 2 (set value/operating mode)

## Connector 3 [III] (with solid fuel/ solar integration)



- Pin 1: Room sensor (heating circuit 2)
- Pin 2: Lower buffer sensor and room sensor (ground)
- Pin 3: Lower buffer sensor (BUFFER-T LOW) at inlet area for solar/solid fuel

## Connector 9 [IX]



- CAN Bus Pin 1 = H (Data)
- CAN Bus Pin 2 = L (Data)
- CAN Bus Pin 3 = - (ground, Gnd)
- CAN Bus Pin 4 = + (12V supply)



## Remote controls

### The operator module BM 8

(Only for controller models with CAN-Bus connection)

Electrical connection: Connector IX; 1-4

The E6 permits connection of an operation-control module BM for each heating circuit via a bus line. The operation-control module allows various operation-control functions and monitoring functions for the system values to be relocated to the main controlled zone – i.e. the living room.

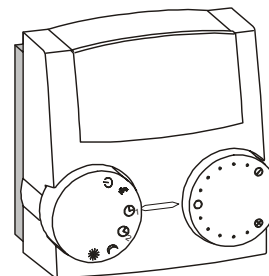
This achieves maximum comfort and convenience. Please refer to the technical description of the BM for a precise description of the overall scope of functions.

- Display of the system parameters
- Entry of the heating circuit parameters
- Room temperature control
- Automatic adaptation of the heat slope



### Remote control FBR2

Electrical connection: Connector I; 1-3 and connector III; 1-3



- Rotating switch for modifying room temperature setting  
Adjusting range: ( $\pm 5$  K)
  - Room control via the integrated room sensor
  - Rotating switch for selecting operating mode
    - ⏻ Standby/OFF (frost protection only)
    - ⌚<sub>1</sub> Automatic mode (according to timer program 1 in controller)
    - ⌚<sub>2</sub> Automatic mode (according to timer program 2 in controller)
    - 🌙 24-hour night operation (reduction temperature)
    - ☀️ 24-hour daytime operation (comfort temperature)
    - ☀️ Summer mode (heating OFF, hot water only)
- !** The heating program switch at the controller must be set to ⌚.

### Installation location:

- In reference / main living room of the heating circuit (on an inside wall of the room).
- Not in the vicinity of radiators or other heat dissipating units.
- Any, if the room sensor influence is switched off.

### Installation:

- Remove cap from underside of pedestal.
- Secure the base at the installation location.
- Connect the electrical connection cables.
- Press the cap back on.

### Sensor resistances FBR

Temperature	FBR1 terminals 1-2 switch in position ☺	FBR2 terminals 1-2 Room sensor
+10 °C	680 Ω	9.950 Ω
+15 °C	700 Ω	7.855 Ω
+20 °C	720 Ω	6.245 Ω
+25 °C	740 Ω	5.000 Ω
+30 °C	760 Ω	4.028 Ω

### DCF receiver

Electrical connection: Connector VII; 1,2

The controller has an optional connection to a DCF receiver.

If the DCF receiver is connected, the controller time is brought up to date daily at 03.02 and additionally 5 minutes after switching on the voltage.

If the time does not correct itself after the specified period, select a different location for the DCF (e.g. a different wall) and restart the controller (switch voltage-free once).

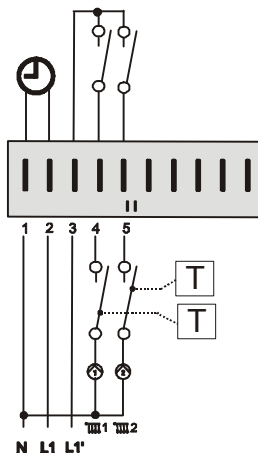
### PC

All system-specific parameters can be set and interrogated using the *ComfortSoft* parameterisation software. The parameters can be saved, displayed graphically and evaluated on the PC at predefined intervals. To connect to a PC you need the optical adapter or CoCo PC active, which also supports the sending of error messages by SMS and the remote interrogation of controller data.

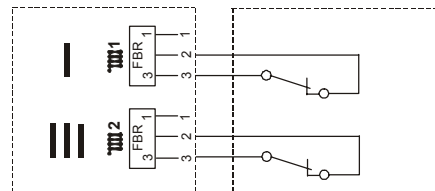
### Maximum delimiter

If a maximum delimiter is required it must be connected between the heating circuit pump and the pump controller switch output.

Connector I, terminals 4 and 5



### Telephone switch



The heating system can be switched to Heating mode \* with a telephone switch. The connection terminals of the controller for the remote control FBR (see connection diagram) are used for installation. As soon as a short circuit is detected at terminals 2 and 3 of the corresponding connector, the assigned heating circuit switches to heating operation. Additionally, the hot water preparation is activated. (Boiler controller) When the short-circuit is eliminated, the controller resumes heating on the basis of the set heating program.

⚠ If the heating circuit is controlled remotely by an operating module, the telephone switch must be connected at the operating module.

## Sensor values / characteristic curve

Temperature	5KOhm NTC	1KOhm PTC
-60°C	698961 Ω	470 Ω
-50°C	333908 Ω	520 Ω
-40°C	167835 Ω	573 Ω
-30°C	88340 Ω	630 Ω
-20°C	48487 Ω	690 Ω
-10°C	27648 Ω	755 Ω
0°C	16325 Ω	823 Ω
10°C	9952 Ω	895 Ω
20°C	6247 Ω	971 Ω
25°C	5000 Ω	1010 Ω
30°C	4028 Ω	1050 Ω
40°C	2662 Ω	1134 Ω
50°C	1801 Ω	1221 Ω
60°C	1244 Ω	1312 Ω
70°C	876 Ω	1406 Ω
80°C	628 Ω	1505 Ω
90°C	458 Ω	1607 Ω
100°C	339 Ω	1713 Ω
110°C	255 Ω	1823 Ω
120°C	194 Ω	1936 Ω

**5KOhm NTC: AF, KF, SPF, VF****1KOhm PTC: AFS, KFS, SPFS, VFAS**

The controller can be operated with 5KOhm NTC (standard) or 1KOhm PTC sensors. The sensor type is selected in the start-up level during start-up.

The start-up level is displayed when the operating cover is opened after the supply voltage has been switched on (once only). It can be reactivated again by briefly switching the supply voltage off.

The sensor switchover affects all sensors.

**Exceptions:**

- Attaching an analogue remote control is detected automatically. This means that the previous and new versions can be connected to the controller [connector I; 1-3 and connector III; 1-3].
- The controller has a facility for connecting a room sensor to terminals [connector I; 1+2 and connector III; 1+2] and performing room temperature-dependent control. In this case only a 5KOhm NTC sensor can be used, irrespective of the sensor type that has been selected.

**Outside sensor AF (AFS)** **Installation location:**

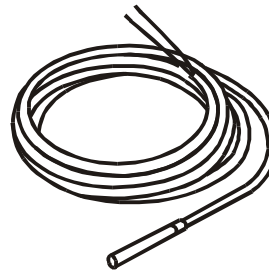
- Wherever possible, on a northerly or north-easterly wall behind a heated room
- Approx. 2.5 m above ground
- Not above windows or ventilation shafts

**Installation:**

- Detach the cover.
- Attach the sensor with the supplied screw.

**Boiler sensor KF (KFS)** **Installation location:**

- Immersion sleeve for thermometer, temperature controller and boiler sensor in heating boiler

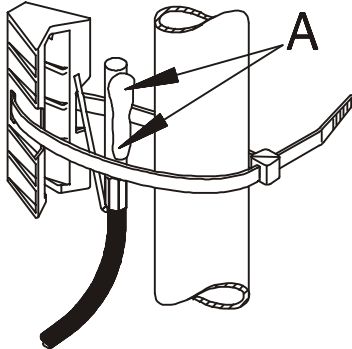
**Installation:**

- Slide the sensor as far as possible into the immersed pipe.

### Flow sensor VF (VFAS) ☒

#### Installation location:

- In the case of boiler control, in place of the boiler sensor KF as close as possible behind the boiler on the heating flow pipe
- In the case of mixer operation ☒ approx. 0.5 m behind the circulation pump



00990-01

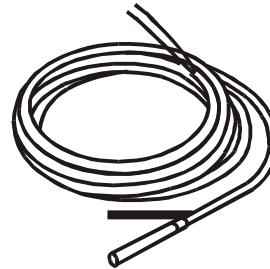
#### Installation:

- Thoroughly clean the flow pipe.
- Apply heat conductive paste (A)!!
- Secure sensor with stretch band.

### Storage tank sensor SPF (SPFS) ☒

#### Installation location:

- In the immersed pipe of the hot-water cylinder tank (generally on the front face of the tank)



#### Installation:

- Slide the sensor as far as possible into the immersed pipe.



The immersed sleeve must be dry.

**Commissioning**

<b>Commissioning level</b> 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
BUS ID 1 (see p. 64)	Enter heating circuit number"1": 00-15 => Standard 01
BUS ID 2 (see p. 64)	Enter heating circuit number"2": 00-15 => Standard 02
5K SENSORS	00 = 5KOhm NTC sensor 01 = 1kOhm PTC sensor code no. required; after input, there is a restart of the controller

**Commissioning procedure**

1. Please read this guide carefully before commissioning
2. Fit controller, make electrical connections and switch on heat generator 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 7)

**BUS- ID (Heating circuit number):**

The heating circuits are sequentially numbered starting with "01". heating circuit numbers must not be assigned twice. Please only use "00" for replacement controllers (see page 64).

## 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 Heat generator (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 heat generator

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 ID (heating circuit number or heat generator 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.

- Heating circuit numbers (00-15) may not be assigned twice.
- Heating 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

heating circuit 1 → 01  
heating circuit 2 → 02

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





## Error messages

Error no.	Error description
Communication error	
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.
Internal error	
E 81	EEPROM error. The invalid value has been replaced with the default value $\triangle$ Check parameter values!!!
Sensor error (break/short)	
E 69	Flow sensor HC2
E 70	Flow sensor HC1
E 75	Outdoor sensor
E 76	Storage tank sensor
E 78	Boiler sensor
E 79	Sensor multifunction relay 1
E 80	Room sensor HC1
E 83	Room sensor HC2 / Lower buffer sensor / Pool sensor

If a fault or error occurs in the heating system, you will see a blinking warning triangle ( $\triangle$ ) 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.

## Troubleshooting

### General

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

### Sensors:

The sensors can be checked in the "General/Service/Sensor test" level. All the sensors that are connected must appear in this level with plausible measurements.

### Actuators (mixer motors, pumps):

The actuators can be checked in the "General/Service/Relay test" level. All relays can be individually switched using this level. This makes it easy to check whether these components have been correctly connected (e.g. mixer motor direction of rotation).

### 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/heating circuit")

In mixer motor expansion controllers with connection to Boiler controller => Display of the outside temperature and the heat generator temperature (see "Display / System")  
Control unit => Room temperature displayed and current room set temperature blanked out "----"  
(see "Display/Heating circuit")

### In case of communication problems

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

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 manual / automatic switch => Automatic

### 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

**Technical data**

**Burner does not switch of at correct time**

Check minimum heat generator temperature and type of minimum delimiter => Protect from corrosion

**Burner will not switch on**

Check set temperature of heat generator => The set temperature must be above the current heat generator temperature.

Check operating mode => Standard ☺ (test ☼)

Check BOB-VALUE

The current temperature of the heat generator's solid fuel is greater than the HS1 set temperature.

Supply voltage to IEC 38	230 V AC ± 10%
Power consumption	Max. 8 VA
Switching capacity of the relays	250 V 2(2) A
Maximum current on terminal L1'	10 A
Enclosure to EN 60529	IP 40
Safety class II to EN 60730	Totally insulated
Switch panel installation in acc. with DIN IEC 61554	Recess 138x92
Power reserve of the timer	> 10 hours
Permitted room temperature during operation	0 to 50°C
Permitted room temperature during storage	- 20 to 60 °C
Sensor resistances	NTC 5 kΩ (AF,KF,SPF,VF)
Tolerance in ohms	± -1% at 25°C
Temperature tolerance	+/- 0.2K at 25°C
	PTC 1010Ω (AFS,KFS,SPFS,VFAS)
Tolerance in ohms	± -1% at 25°C
Temperature tolerance	+/- 1.3K at 25°C

Malfunctions due to improper operation or settings are not covered by the warranty.