

smart(Econ Heat Control

HEATING SYSTEM CONTROLLER FOR HEAT
GENERATION AND DISTRIBUTION

OPERATING AND INSTALLATION
INSTRUCTIONS

HCW 1620



HCW 810



emz - THE SMILING COMPANY

emz
smart solutions

These Operating and Installation Instructions are an integral part of the product.

- › Read Assembly and Operating Instructions carefully before using the product.
- › Keep them in a safe place during the product's entire service life.

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Table of contents

Table of contents..... 3

Important information 8

 Notes on this manual 8

 Safety information 8

 Conditions of use 9

 Intended use 10

 Installation and connection 10

Product description 11

 Outdoor temperature-controlled room heating 11

 Self-adjustment / heating behavior 11

 Control of heat generators 11

 smart EconControl options 12

 Water heating 12

 Anti-legionella function 12

 Solar heating system 12

 smart Econ Transmission technology 12

 Distance communication via the Internet 12

 Remote maintenance via smart Econ Cloud 12

 Cloud access 13

 Information and control 13

 Safety 13

 Data protection 13

Device description 14

 smart Econ HCW 14

 smart Econ HCW 1620 Expansion module 14

 Connections and interfaces on the smart Econ HCW 15

 smart Econ Room controller 15

 CAN bus line 15

Operating the smart Econ room controller 16

 Heating 16

 Special functions 16

Operating the smart Econ Userinterface 17

 Control elements 17

 Display 17

Prompts during operation 18

 Overview mode 18

 Menu 18

 Select menu items 19

 Overview menu 19

TABLE OF CONTENTS

›Heat Circuits‹ menu (Overview menu).....	20
›Temperatures‹ menu	21
›Outputs‹ menu	21
›Diagnosis‹ menu	22
Error messages.....	22
Information	22
Settings during operation	23
Entering the access code.....	23
Change values	23
Menu structure	24
Abbreviations in the menus.....	25
Main menu	26
›OPERATING MODES‹ menu	27
Operating mode ›AUTOMATIC‹.....	28
Operating mode ›DAY‹.....	28
Operating mode ›NIGHT‹.....	28
Operating mode ›FROST PROTECTION‹	28
Operating mode ›SUMMER‹	28
Operating mode ›FLOOR PAVEMENT HEATING‹.....	28
Operating mode ›OFF‹.....	29
Operating mode ›CHIMNEY SWEEP‹	29
›TIMER PROGRAMS‹ menu.....	30
Setting heating periods and temperatures	31
Selecting the day of the week	31
Setting times and temperatures	31
›COPY DAY...‹	31
›COPY ALL VALUES...‹	31
Table for rooms and heating times.....	33
Table for rooms and heating times.....	34
›HOLIDAY PERIODS‹ menu.....	35
›HEAT CIRCUITS‹ menu	36
›DOMESTIC HOT WATER‹ menu	38
Setting the domestic hot water setpoint temperature.....	38
Setting the domestic hot water heating times	39
Manual control of domestic hot water heating.....	40
Setting circulation times	40
Configure circulation temperatures	41
›GENERAL‹ menu.....	42
Setting the language of the menu	42
Set date and time	42
Adjusting the display brightness and buzzer volume	43
›INTERNET‹ menu.....	44

Installation and connection.....	45
smart Econ Temperature sensor	46
smart Econ HCW	47
Dimensions smart Econ HCW	47
Opening the smart Econ HCW housing.....	48
Installation location smart Econ HCW.....	48
Installation smart Econ HCW.....	49
Connection smart Econ HCW.....	50
smart Econ Room controller	51
Node number room controller	51
Dimensions room controller	51
Opening the room controller housing.....	51
Installation location room controller	51
Installation room controller.....	52
Room controller connection	52
Connection CAN-Bus.....	53
Cable routing.....	53
4-pole CAN bus line	54
Internet-based network	55
Prerequisites	55
Hydraulic systems and connection diagrams.....	56
Further hydraulic systems.....	56
Hydraulic symbols.....	57
Hydraulic system 1: ›HCW 001 Sok (HCW 810)	58
Hydraulic system 2: ›HCW 002 SF (HCW 810)	60
Hydraulic system 3: ›HCW 003 (HCW 810).....	62
Hydraulic system 4: ›HCW 004 Sok (HCW 810)	64
Hydraulic system 5: ›HCW 005 Sok (HCW 810)	66
Hydraulic system 6: ›HCW 006 HP (HCW 810).....	68
Hydraulic system 7: ›HCW 007 Sol-SF (HCW 810).....	70
Hydraulic system 8: ›HCW 008 Sok (HCW 1620 Base Unit).....	72
Hydraulic system 8: ›HCW 008 Sok (HCW 1620 Expansion Module).....	74
Hydraulic system 9: ›HCW 009 SF (HCW 1620 Base Unit)	76
Hydraulic system 9: ›HCW 009 SF (HCW 1620 Expansion Module)	78
Hydraulic system 10: ›HCW 008 Sok (HCW 1620 Base Unit).....	80
Hydraulic system 10: ›HCW 008 Sok (HCW 1620 Expansion Module).....	82
Hydraulic system 11: ›HCW 011 KAS (HCW 1620 Base Unit).....	84
Hydraulic system 11: ›HCW 011 KAS (HCW 1620 Expansion Module).....	86
Hydraulic system 12: ›HCW 012 Sok (HCW 1620 Base Unit).....	88
Hydraulic system 12: ›HCW 012 Sok (HCW 1620 Expansion Module).....	90
Hydraulic system 13: ›HCW 013 HP (HCW 1620 Base Unit)	92
Hydraulic system 13: ›HCW 013 HP (HCW 1620 Expansion Module).....	94

TABLE OF CONTENTS

Hydraulic system 14: ›HCW 014 Sol-SF‹ (HCW 1620 Base Unit)	96
Hydraulic system 14: ›HCW 014 Sol-SF‹ (HCW 1620 Expansion Module)	98
Abbreviations for hydraulic components, inputs and outputs	100
Function description	101
Solar operation	101
Collector cooling	101
Storage recooling	101
Limit temperature	101
Solar pump anti-lock circuit (ABS)	101
Buffer management function	101
Heat generator	102
Modulating heat generators (optional)	102
Operation of two heat generators	102
Air-source heat pump and peak load boiler	102
Wood-fired boiler and conventional heat generator	102
Timer program	103
Global day/night temperature	103
Frost protection	103
Summer operation	103
Domestic hot water temperature	103
Domestic hot water priority	104
Outdoor temperature-controlled setting	104
Control loops with mixers	104
Heating curve	104
Using the smart Econ room controller	105
Outdoor temperature-guided control without remote setting	105
Outdoor temperature-guided control with remote setting	105
Outdoor temperature-guided control with room influence	106
Commissioning	107
Device configuration	108
Enter access code for the installer	108
Main menu for the installer	108
›INSTALLER‹ menu	109
›COMMISSIONING‹ menu	110
Select hydraulic system	111
Setting the date, time and daylight saving time	111
Configuring heating circuits/zones	111
Change heating curve	113
Configure request for heat generator	114
Configure heat pump	115
Configure solid fuel boiler	116

Configure solar system	117
Sensor adjustment	121
Configuring frost protection	123
Configuring the room controller ›CONFIG RC‹	123
›OPERATING HOURS‹ Menu	125
›TEST‹ Menu	126
Test operation	126
Manual switching of outputs	127
Simulate temperatures	127
Simulate room temperatures	128
Simulate inputs	128
Bus setup	129
›HEAT CIRCUITS‹ menu (Installer)	130
Configure heating circuit	131
Configuring room temperature influence on the heating curve (heating circuits without mixer)	132
Configuring the mixer control (heating circuits with mixer)	133
Configuring the heating pump	134
›DOMESTIC HOT WATER‹ menu (Installer)	135
Setting the domestic hot water setpoint temperature (Installer)	136
Configure domestic hot water priority	137
Configuring the domestic hot water pump	137
Setting circulation times (Installer)	138
Configuring the circulation pump	138
Configure circulation temperatures	139
›GENERAL‹ menu (Installer)	140
›INTERNET‹ menu (Installer)	143
smart Econ Cloud setup	143
Generate new Auth-Code	144
Delete user	144
Technical data	145
smart Econ HCW	145
smart Econ Room controller	145
smart Econ Temperature sensor	145
Solar and boiler temperature sensors	145
Storage tank and buffer temperature sensor	145
Flow/return contact temperature sensor	146
Characteristic curve and resistance values of PT1000 temperature sensors	146
Disassembly/disposal	147
Warranty and liability	148
Index	149

Important information



Notes on this manual

These operating and installation instructions are intended for both system operators and specialist installers.

The instructions are divided into several sections for a better overview. Each of these sections is marked with an icon at the edge of each page:

This symbol indicates **Sections with general information**.



These sections contain important information, safety instructions and descriptions of the properties of the controller as well as general operating instructions.

These sections are intended for both operators and professional installers.

This symbol indicates **sections with information on regular operation**.



These sections contain descriptions of how to input individual settings on the controller.

These sections are aimed in particular at system operators.

This symbol indicates **sections with information for installation, commissioning, system-specific programming** and further specialist information for specialist installers. This information enables specialist installers to set the controller for the proper operation of the system.



NOTE

All depictions mentioned are examples and serve for a better understanding. Content and sequence depend on the selected system.
Errors and modifications reserved.

Safety information

The assembly and operating instructions indicate possible hazards:



DANGER indicates an almost certain danger of serious personal injury or death.



WARNING indicates a possible danger of serious personal injury.



CAUTION indicates a possible danger of slight personal injury.

NOTICE indicates a possible danger of damage to the equipment.



When handling the smart Econ heating system controller and accompanying equipment, please make sure that the safety provisions in the assembly and operating instructions are complied with!

Conditions of use

These instructions describe the installation, startup, operation, repair and disassembly of the smart Econ heating system controller.

Observe all technical documentation of all the components used such as boiler, tank, pumps, mixers, and valves, etc. when operating the system.

 DANGER	
	<p>Assembly, connection, startup, repair and disassembly</p> <p>Danger of death by electrocution!</p> <p>Whenever working with the terminal cover open, make sure that all poles of the power supply are completely disconnected and protected against being switched on again!</p>

The heating system controller is used by the system operator, who in most cases will be a layperson.

NOTE	The heating system controller replaces by no means the safety components required under system engineering aspects!
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Make sure not to use the heating system controller until you have thoroughly read and understood these Assembly and Operating Instructions and the safety provisions. Comply with all safety provisions and contact a specialist in case of doubt.

NOTE	The installer of the heating system controller must instruct the system operator on the handling, function and principle of operation of the smart Econ and the components connected to it!
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Keep these assembly and operating instructions and all reference documents accessible at all times.

When relocating or when selling the device, hand the documents over to your successor.

NOTE	Only adults with the appropriate knowledge and experience may access the device during operation./when it is in operation.
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NOTE

Make sure that only a dry or slightly moistened cloth is used for cleaning and servicing of the housing, the control elements and the display.

The surfaces must never get into contact with cleaning products or solvents - mat, brittle or slightly dissolved plastic parts must be replaced immediately!

A device with damaged housing must not be operated!

Intended use

The smart Econ heating system controller may only be used as a controller for thermal systems.

Always observe all described specifications during operation! / when operating the device!

Only specialists may install and set up the heating system controller.

The installer must have read and understood the operating manual. The installer explains all the relevant functions to the operator.

For operation, it is essential that the housing is closed and undamaged.

Installation and connection

Before connecting to the electrical system, the smart Econ HCW Userinterface and the expansion module must be fixed to a vertical, robust surface (wall), see "Installation and connection" on page 45.

For its own power supply and that of the outputs, connect the heating system controller to an electrical energy supply system in accordance with the technical data.



DANGER



Loose installation or connection

Danger of death by electrocution!

Whenever working with the terminal cover open, make sure that all poles of the power supply are completely disconnected and protected against being switched on again!

NOTE

The heating system controller may only be assembled, connected, commissioned, repaired and disassembled by specialists.

The installation and protection regulations for the installation, commissioning and operation of low-voltage installations in accordance with EU and national law must be observed.

Product description

The smart Econ heating system controller was especially developed for single-family houses and apartment buildings. The goals are the creation of optimum comfort for residents and the greatest possible ease of use for the system operator.

The smart Econ heating system controller can be operated either via the 4 buttons and the rotary/push button on the control panel or optionally via existing internet access using a PC, smartphone or tablet.

The smart Econ heating system controller is a modern system to control the entire domestic technology of single-family houses and apartment buildings.

As many components of domestic technology can be integrated into one single system, there are many options for system optimization (e.g. energy efficiency, ease of operation, optimization of comfort and maximum coziness).

Outdoor temperature-controlled room heating

When delivered, the controller is designed for purely outdoor temperature-controlled systems.

Depending on the outside temperature, control valves regulate the flow temperature of the respective control circuit according to the set heating curve.

A smart Econ room controller can also be used for remote adjustment. The room temperature influence can be set as an additional reference variable by connecting the room controller.

To take solar radiation into account, several room controllers can be attached (e.g. to separate the heating circuits on the north and south side).

Self-adjustment / heating behavior

Optionally, heating behavior can be influenced by using a smart Econ room controller.

The inertia of the room is initially assumed to be "average" and later adapted in a learning phase of about 3 days, during which the desired progression of the room temperature is compared with the actual development in the main room. In most cases, the optimum setting is found after 3 days. Of course, this adjustment can be repeated at any time.

This way, heating operation is optimized in terms of comfort, homeliness and energy consumption independently of the type of heating (underfloor heating system, wall heating or any combination thereof).

Control of heat generators

In general, all types of heat generators (gas, oil, solid fuel, district heating, heat pumps, ...) can be integrated into the smart Econ system control.

The heat generators are either enabled by a smart Econ room controller when heat is required or controlled according to the heat demand flexibly depending on outdoor temperature or constantly based on tank temperature etc.

The objective of this is to achieve the longest possible switching intervals to minimize the exhaust emissions by reducing the number of startups and at the same time to increase the heat generator's service life.

smart EconControl options

i If a room controller is used, the flow temperature of the associated heating circuit can be raised briefly for rapid heating if there is a large deviation in the room temperature. The flow temperature is reduced during setback operation.

If there is no heat demand, the pumps of the relevant heating circuits are switched off.

Water heating

Different preset temperatures can be defined for different times of the day. This allows for energy savings in general, as the hot water is only controlled to the required temperature in the desired time range.

Depending on the hydraulic system, two temperature sensors (top and bottom) can be defined (e.g. switch on when the storage tank becomes "cold" at the top, and switch off when the lower part is "warm").

A boiler priority circuit is also supported.

Anti-legionella function

To kill germs, the thermal disinfection program is carried out once a week every Monday. The domestic hot water is heated to 63°C.

Solar heating system

A configurable differential temperature control ensures that the solar heating system generates as much heat as possible.

You can load several heat consumers (buffer, boiler, swimming pool, etc.) with different temperature levels.

smart Econ Transmission technology

The components of the heating system smart Econ controller can be networked together. This way, data is transferred via the fieldbus system CAN (Control Area Network).

"CAN bus line" on page 15

Distance communication via the Internet

The smart Econ heating system controller features an integrated Ethernet interface. that can be used to connect it to the Internet. The Ethernet makes remote switching possible. The user can also download the configuration, operating statuses, archive and software updates from the network. The information messages can be sent directly via e-mail, free access to smart Econ Cloud provided.

"Internet-based network" on page 55

Remote maintenance via smart Econ Cloud

The smart Econ heating system controller can be remotely maintained via the smart Econ Cloud of the company emz via the Internet. The current operating status of the system can be queried and the configuration can be changed.

Cloud access

After one-time authentication using the TAN procedure (TAN key/ID code not included) and successful logon, the smart Econ Cloud provides remote access to the controller. Whether PC, Tablet or Smartphone, the menu interface adapts automatically.

Access via: www.smarteconcloud.com

“smart Econ Cloud setup” on page 143

Information and control

The current status of the controlled pumps, valves and boiler can be read off at a glance from the graphic system diagram. This is the graphic of the selected system that is also visible on the controller.

In addition to the current system data, the controller's status messages, error messages and data archive are available for viewing. In addition, the various operating modes can be selected and individual parameter values of the controller can be changed.

The recordings stored in the controller are processed graphically and can also be displayed together over a longer period of time.

Safety

Access to the controller is protected in three ways. First, the ID code to be entered at the first login and a randomly generated 20-digit authentication code - both codes will be checked internally at each access later on. After logging in, the 6-or-more character, individual user password forms the third level of protection.

Initial access is activated via a secure TAN procedure.

Data protection

The protection of personal data is our top priority. For identification purposes, no personal data other than the name and a valid e-mail address is collected from the operator when registering.

Device description

- **smart Econ HCW** - Heat Control Wall
Compact unit with **Userinterface** for wall mounting
 - **HCW 810** with 8 sensor inputs and 10 outputs
 - **HCW 1620** consisting of the base unit with Userinterface and an expansion module, networked via CAN bus. Application for complex systems with 16 sensor inputs and 20 outputsThe devices are fitted with a micro-USB and an Ethernet connection at the factory.

Optional accessories:

- **smart Econ RC** - Room Control
Room unit for room temperature measurement and setpoint temperature adjustment with party and setback function
- **smart Econ Temperature sensor**
Type and range depending on the design of the heating system

smart Econ HCW



smart Econ HCW integrates the controller and the Userinterface into one compact housing for wall mounting.

Temperature sensors as well as pumps and valves are connected to the controller.

The smart Econ HCW is connected to the smart Econ Room controllers via CAN bus.

The display shows the menus for configuration, the temperatures of all the configured temperature sensors, as well as diagnostics and error messages.

The Userinterface provides a combined turn/push button for operating the menus as well as 4 function keys, see "Control elements" on page 17.

smart Econ HCW 1620 Expansion module



smart Econ HCW 1620 is composed of the base unit with the Userinterface and the expansion module.

Temperature sensors as well as pumps and valves are connected to the expansion module in the same way as to the base unit.

The expansion module is connected to the base unit and the smart Econ Room controllers via CAN bus.

Connections and interfaces on the smart Econ HCW

The smart Econ HCW has the following connections inside the housing:

- Connections for pumps and mixers (terminal strips)
- Connections for temperature sensors (terminal strips)
- 1 CAN bus interface (terminal strip for 4-wire cable)
- 1 Ethernet interface (LAN) at the back of the housing (Western socket for CAT 5 cable)
An Internet connection can be established via the LAN interface. This allows additional PC operation via the smart Econ Cloud (access optional).
“Internet-based network” on page 55
- 1 USB interface inside the housing (Micro-USB-B)
“Installation and connection” on page 45

smart Econ Room controller



The smart Econ room controller determines the current room temperature.

The desired room temperature can be readjusted using the setting wheel. In addition, the operating mode for the assigned heating circuits can be changed via the end positions of the setting wheel:

In the end position (+) a permanent party mode (always heat) and in the end position (-) a permanent setback function.

CAN bus line

Connect the individual system components in series with a 4-pole cable, the CAN bus line.

The CAN bus line merely has to be connected from one component to the next, which significantly reduces the installation effort.

Data is transferred via the fieldbus system CAN (Control Area Network).

Operating the smart Econ room controller



Range +3 to -3

The room temperature setpoint is changed by the value set.

End position +

Party function for the assigned heating circuits. The highest room temperature setpoint entered is used, irrespective of the time program.

End position -

Setback function for the assigned heating circuits. The temperature is controlled to the setback temperature entered for this room.

Heating

- To readjust the desired room temperature, turn the setting wheel to the desired temperature difference.

Example:

The programmed room setpoint temperature is 21 °C.

The room controller is on 2. Step adjusted in direction + .

This results in a desired room temperature of 23 °C.

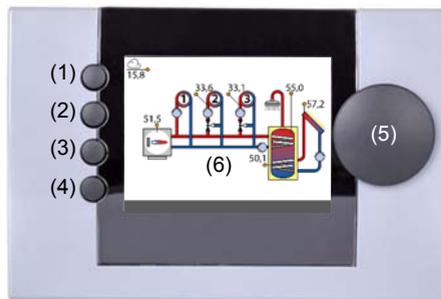
Special functions

- If you want to heat during the set-back times (party mode), turn the setting wheel to the end position + .
The connected heating circuit changes continuously to day mode until the setting wheel is reset.
- To activate the setback function (e.g. holiday), turn the setting wheel to the end position - .
The connected heating circuit changes to night mode until the setting wheel is reset.

Operating the smart Econ Userinterface

Control elements

The smart Econ Userinterface is set up and operated with a combined turn/push knob (turn knob) for menu navigation and 4 function buttons.



Basic display, overview mode

- (1) Function key 1 / Abort (^)
- (2) Select function key 2 / digit left (<)
Function keys 1 and 2 can be used for switching functions.
- (3) Select function key 3 / digit right (>)
Function button for quick access and software switch
- (4) Help function: **INFO key** for function explanations (i)
(If available, the operating options of the function keys are shown on the display.)
- (5) Combined **Turn/push button** with **OK** button function for menu navigation
- (6) Display

You input settings and queries using the turn/push button:

“Select menu items” on page 19

“Change values” on page 23

Display

The smart Econ Userinterface has a graphic display which is permanently illuminated to indicate the operating status and to communicate in case of setup, malfunction, change and evaluation.

If no action is taken on the control elements of the Userinterface for a longer period (approx. 5 min), the menu switches back to the hydraulic system and the brightness of the display is dimmed (“Adjusting the display brightness and buzzer volume” on page 43).

To access the main menu, the access code must be entered (again).



Prompts during operation

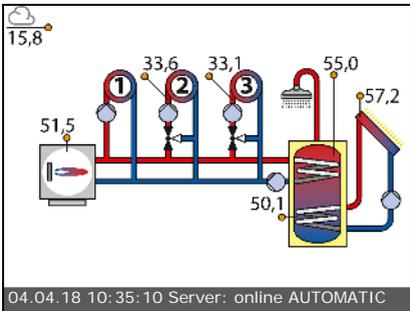
Using the smart Econ Userinterface, you can check the current system status and adjust the settings.

NOTE	Check the display screen of the smart Econ on a regular basis to be able to eliminate any malfunctions promptly!
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Overview mode

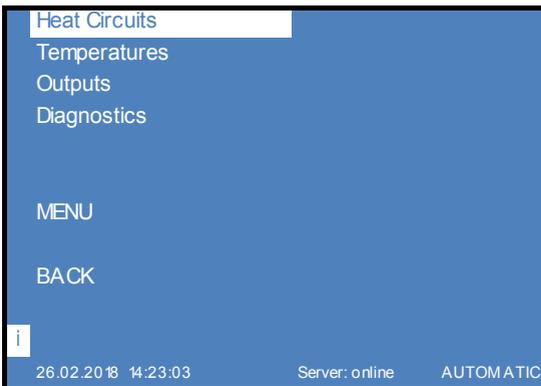
In overview mode, the configured system diagram, sensor temperatures and the operating statuses of connected components are displayed.



(Example)

Press the rotary/push button to access the menu.

Menu



The menu shows the available options for displaying the controller's temperatures and operating statuses.

The selected menu item is highlighted.

Certain menus are divided into several pages, which you can select with the rotary/push button.

The menu item ›BACK‹ always appears in the last line of the last page.

The menu can also be exited by simply pressing the rotary/push button.

On the bottom line, you can see the date and time on the left, status messages in the middle and the current operating mode on the right.

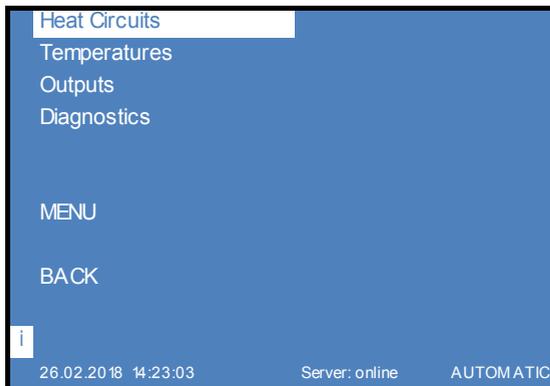
On the left, the current function of the function keys (1)-(4) is displayed.

See “Control elements” on page 17

Select menu items

- To select the required menu item, scroll through the menu by *turning* the rotary/push button - the respective selectable option appears highlighted on the display.
- *Pressing* the rotary/push button (“OK”) confirms the selected menu item.
The respective submenu is opened or the corresponding selection is activated.
- Select ›BACK‹ to jump back one level from any subitem in the menu.
- By *pressing the INFO button* or by selecting ›INFO‹, you can access help information on the selected menu item.

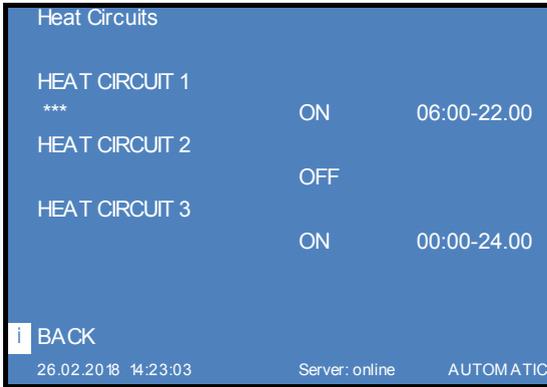
Overview menu



The overview menu contains the most important information for you to get a quick overview of the system status.

- Select a submenu.
 - “›Heat Circuits‹ menu (Overview menu)” on page 20
 - “›Temperatures‹ menu” on page 21
 - “›Outputs‹ menu” on page 21
 - “›Diagnosis‹ menu” on page 22
- Use ›MENU‹ to change settings.
See “Main menu” on page 26
- Select ›BACK‹ to return to the overview mode.

›Heat Circuits‹ menu (Overview menu)



The ›Heat Circuits‹ menu displays the operating states of all heating circuits in the configured system.

- If the controller is in day mode, the duration programmed for day mode appears to the right of the current operating status.
If the party function is activated, the time period 00:00 - 24:00 is displayed; no time is displayed in the setback and frost protection modes.
- If the controller is not in day mode, e.g. outside the programmed time period or if the operating mode does not permit day mode, nothing appears at this point.
- The ›ON‹/›OFF‹ status indicates whether the heating circuit is ready for operation.

Example: HC 1 =>AUTOMATIC‹, HC 2 =>NIGHT‹, HC 3 =>DAY‹.

NOTE

In the event of a fault, e.g. a defective sensor, three asterisks *** appear under the relevant heating circuit

›Temperatures‹ menu

Temperatures	
flow heat circ. 3 <2/22>	36.7
flow heat circ. 4 <2/24>	44.1

damped out-temp.	1.2
 BACK	
26.02.2018 14:23:03	Server: online AUTOMATIC

The ›Temperatures‹ menu displays the measured or calculated temperature values of the configured system.

The <number> after the input designations shows the number of the connection contact to which the respective sensor is connected.

Example: ›flow heat circ. 1 <1/20>‹

Designations *without* <number> are *calculated* temperature values *without* connection contact.

Example: ›damped out-temp.‹

›Outputs‹ menu

Outputs	
pump heat circ. 1 <1/36>	ON
pump heat circ. 2 <1/38>	ON
pump heat circ. 3 <2/36>	OFF
pump heat circ. 4 <2/38>	OFF
pump dhw <1/34>	OFF
pump circ. <2/40>	ON
 BACK	
26.02.2018 14:23:03	Server: online AUTOMATIC

The ›Outputs‹ menu displays the operating statuses ›ON‹/›OFF‹ of the controlled controller outputs in the configured system.

The <number> after the output designations indicates the number of the switched connection contact. Designations *without* <number> are *logical* switching states *without* connection contact.

›Diagnostics‹ menu



Diagnostics	
setpoint-HC 2	21.0
setpoint-HC 3	21.0
setpoint-HC 4	21.0
request heat gen.	OFF
DHW PRIORITY	0.0

 BACK

26.02.2018 14:23:03 Server: online AUTOMATIC

The ›Diagnostics‹ menu displays the current states and values of all components and thus of the entire heat generation process.

The values displayed are *logical* switching states and *calculated* values that display the target state of the control loops.

Error messages



In the event of a fault, an alarm message appears on the display.

Information



You can display further information by pressing the function key marked ›i‹.

Settings during operation

Entering the access code

To prevent settings from being changed accidentally, it is necessary to enter an access code for the smart Econ heating system controller.

In the overview menu (page 19) you can call up the main menu:

- Select ›MENU‹.
You have to enter the access code.



- Enter the access code for the end user (Code: 0000), if necessary.
See Change values below
- Press the turn knob to confirm.

The main menu is now available. "Main menu" on page 26

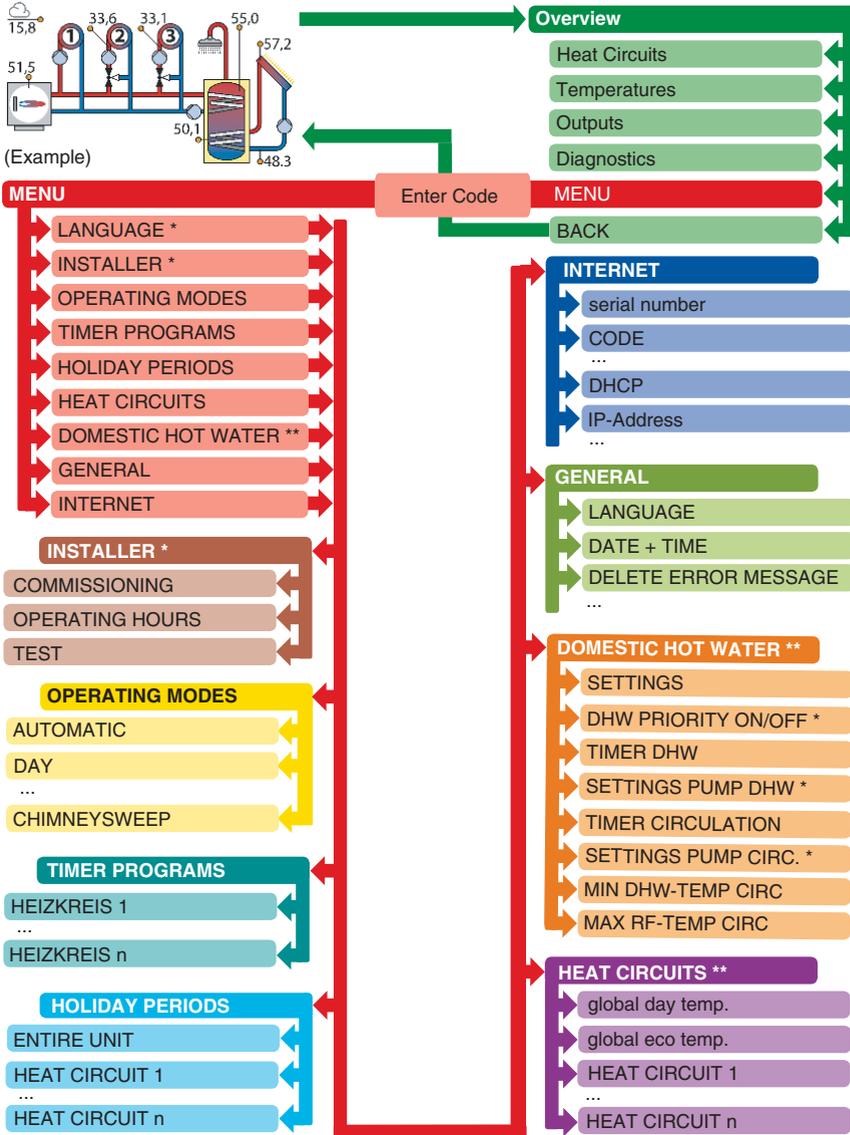
Depending on the access code, the corresponding menu items appear.

NOTE	The Userinterface does not display any submenus that are not needed by the selected hydraulic system or the activated options.
-------------	--

Change values

- Select the value to be changed (e.g. code or temperature) by turning the rotary/push button (highlighted).
- Press the rotary/push button to change the value.
- Use the function keys 2 (<) and 3 (>) to select the digit of the number to be changed (underlined).
Example code: 0000
- Press and turn again to increase or decrease the value.
Example code: 0004
- Press the rotary/push button to confirm the value.
- Repeat the procedure for further digits of the number, if necessary.

Menu structure



* Menu items are only available for the installer, see page 108

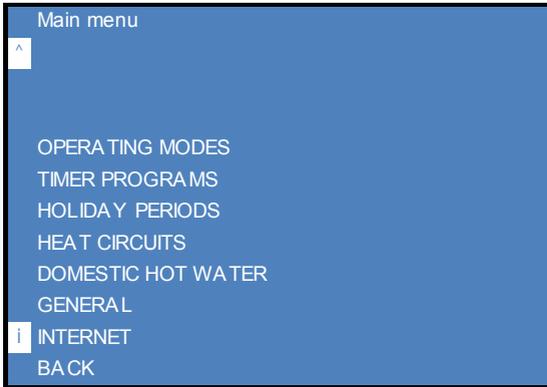
** Menu depends on the selected system.

Abbreviations in the menus

Abbreviation	Description
ABS	Anti-blocking system
CIRC	Circulation
DHW	Domestic hot water
FL	Flow line
HC	Heat Circuit
HG	Heat generator
HP	Heat pump
OT	Outside temperature
P	Pump
RC	Room controller
RL	Return line
SFB	Solid fuel boilers
SOL	Solar



Main menu



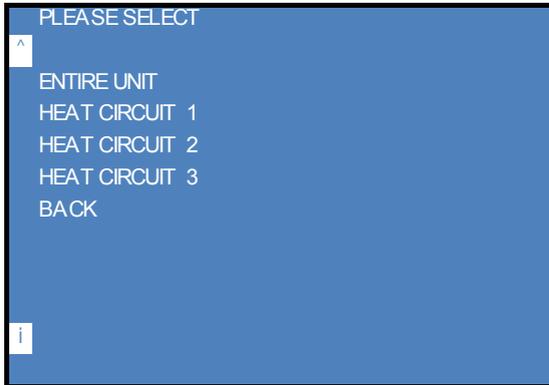
The ›Main menu‹ is displayed after selecting the access code for the end user (Code: 0000). See “Entering the access code” on page 23

Here you can input settings.

- “›OPERATING MODES‹ menu” on page 27
- “›TIMER PROGRAMS‹ menu” on page 30
- “›HOLIDAY PERIODS‹ menu” on page 35
- “›HEAT CIRCUITS‹ menu” on page 36
- “›DOMESTIC HOT WATER‹ menu” on page 38
- “›GENERAL‹ menu” on page 42
- “›INTERNET‹ menu” on page 44

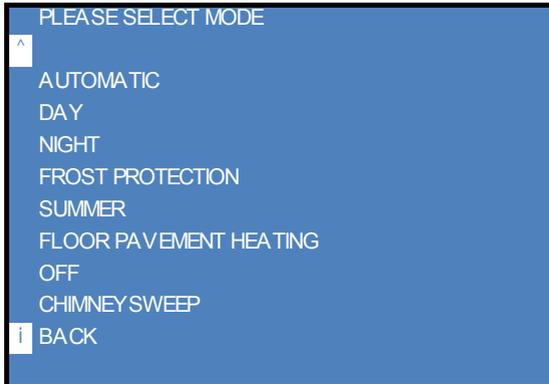
Note: Additional menu items available for the installer.
“Main menu for the installer” on page 108

›OPERATING MODES‹ menu



(Example, depending on the selected system)

In the ›OPERATING MODES‹ menu, first select whether the setting is to apply to the entire system or only to the individual heating circuit.



In the menu ›PLEASE SELECT MODE‹ you then define the operating mode for the selected section of the system. The following modes are possible:

- Operating mode ›AUTOMATIC‹
- Operating mode ›DAY‹
- Operating mode ›NIGHT‹
- Operating mode ›FROST PROTECTION‹
- Operating mode ›SUMMER‹
- Operating mode ›FLOOR PAVEMENT HEATING‹
- Operating mode ›OFF‹
- Operating mode ›CHIMNEY SWEEP‹



NOTE

With the exception of the operating modes ›FROST PROTECTION‹ and ›OFF‹, no messages are displayed indicating that the selected operating mode is active.

The selected operating mode is displayed in the footer.

Operating mode ›AUTOMATIC‹

System control according to the time programs entered and the chosen ambient temperature set-points (›HEAT CIRCUITS‹ menu” on page 36).

The user can make changes with the smart Econ room controller's setting wheel, see “Operating the smart Econ room controller” on page 16.

As this is set directly at the smart Econ room controller, each user can control the entire heating system for the respective area without requiring any special knowledge of the heating installation or its control system.

Operating mode ›DAY‹

Time programs are not considered. The highest room temperature setpoint entered for the respective heating circuit is used.

Operating mode ›NIGHT‹

The time programs are not considered, the temperature is always controlled to the room temperature setpoint entered for setback operation. The temperature is also controlled to this setback room temperature on individual programmed holidays as well as on the last holiday of a holiday period. See “›HOLIDAY PERIODS‹ menu” on page 35

Operating mode ›FROST PROTECTION‹

Time programs are not considered. The temperature is always controlled to the frost protection room temperature.

Except for the last day, the temperature is also set to this value during a holiday period. See “›HOLIDAY PERIODS‹ menu” on page 35

You can change the frost protection temperature directly in the settings of the ›FROST PROTECTION‹ operating mode and it applies to the entire system.

NOTE

The frost protection function is always active in all operating modes except the ›OFF‹ operating mode.

Operating mode ›SUMMER‹

The space heating is off, all other functions (water heating, solar heating system, etc.) are active. The heating circuit pumps and mixers are switched on briefly once a week to prevent them from getting stuck when they are not being used regularly during the summer.

Operating mode ›FLOOR PAVEMENT HEATING‹

Note: The ›FLOOR PAVEMENT HEATING‹ mode is only available for heating circuits with mixers.

To be able to properly dry heated screed, the material is heated according to a standardized flow temperature curve (irrespective of the room temperature).

Note: ›FLOOR PAVEMENT HEATING‹ can be activated with the access code for the end user, but cannot be set.

Progress of the drying process

day	0	1	2	3	4	5	6	7	8	9	10
Temperature	20°	25°	30°	35°	40°	40°	40°	40°	40°	30°	20°

Change at midnight every day, regardless of the activation time.

Operating mode ›OFF‹

In this operating mode, all current temperatures and other input information are displayed but no switching functions are activated.

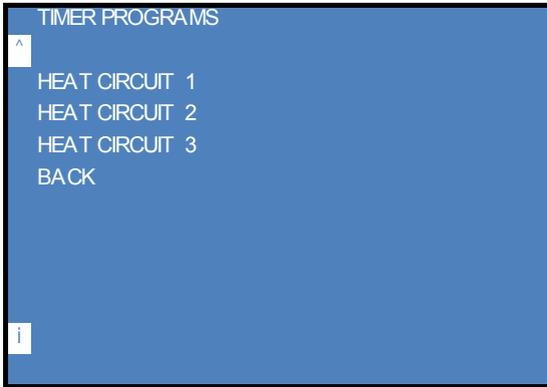
All components of the system must be switched to inactive!

Operating mode ›CHIMNEY SWEEP‹

In this operating mode, the heating can be switched on immediately at any room temperature. The boiler is heated up to the highest setpoint entered.

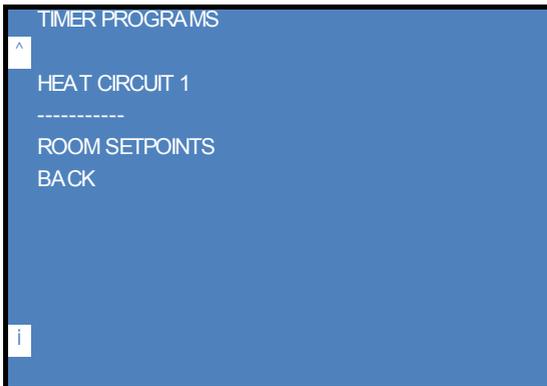


›TIMER PROGRAMS‹ menu

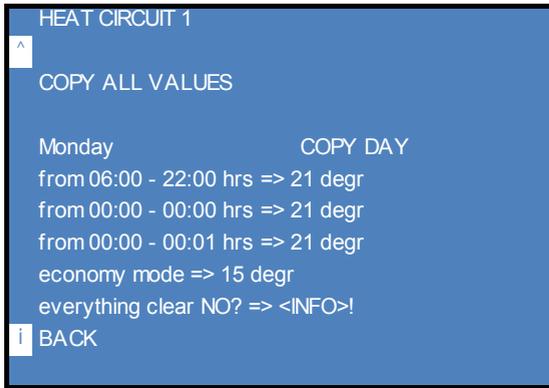


(Example, depending on the selected system)

In the ›TIMER PROGRAMS‹ menu, first select the heating circuit to which the setting is to apply.



Then select ›ROOM SETPOINTS‹.



Setting heating periods and temperatures

You can define up to three heating periods for each room and day of the week.

You can define a room temperature for each set period.

In between these periods, the system regulates itself to the setback temperature.

If you set the time from 00:00 to 00:00, the system will not be controlled at this time.

You can enter the times in steps of 10 minutes, the temperatures in steps of 1/10 degree.

Selecting the day of the week

The default setting is ›Monday‹ .

Select the day (shaded) with the turn knob and press the knob. The day will begin to flash. Turn the turn knob to the left or right and press it to select a different day.

Setting times and temperatures

“Change values” on page 23

›COPY DAY...‹

With the turn knob, select ›COPY DAY...‹ (highlighted) and press the turn knob. A submenu in which you can select the day of the week is opened.

Example: Tuesday should be the same as on Monday.

Select ›Tuesday‹, press the turn knob, ›COPY DAY...‹, press the turn knob, select ›Monday‹, press the turn knob.

›COPY ALL VALUES...‹

With the turn knob, select ›COPY ALL VALUES...‹ (highlighted) and press the turn knob. A selection of additional rooms is displayed. Turn the turn knob again to select a room and press to confirm and copy all times and temperatures from this room.



SETTINGS DURING OPERATION

Example:

›HEAT CIRCUIT 1‹ has been defined,

›HEAT CIRCUIT 2‹ should have the same heating times and temperatures.

Select ›HEAT CIRCUIT 2‹, press the turn knob, ›COPY ALL VALUES...‹, press the turn knob, select

›HEAT CIRCUIT 1‹, press the turn knob.



On the following pages, you will find blank forms for rooms in which you can enter the name of the room, three heating temperature levels with the corresponding heating periods as well as the set-back temperature (in between) for your system.

Table for rooms and heating times

Room:			
Day of the week	Temperatures and periods		
	°C	°C	°C
Monday	:- :	:- :	:- :
Tuesday	:- :	:- :	:- :
Wednesday	:- :	:- :	:- :
Thursday	:- :	:- :	:- :
Friday	:- :	:- :	:- :
Saturday	:- :	:- :	:- :
Sunday	:- :	:- :	:- :
	In between:	°C	(setback temperature)

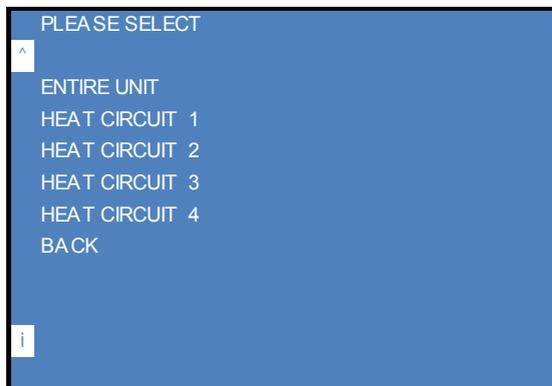
Room:			
Day of the week	Temperatures and periods		
	°C	°C	°C
Monday	:- :	:- :	:- :
Tuesday	:- :	:- :	:- :
Wednesday	:- :	:- :	:- :
Thursday	:- :	:- :	:- :
Friday	:- :	:- :	:- :
Saturday	:- :	:- :	:- :
Sunday	:- :	:- :	:- :
	In between:	°C	(setback temperature)



Table for rooms and heating times

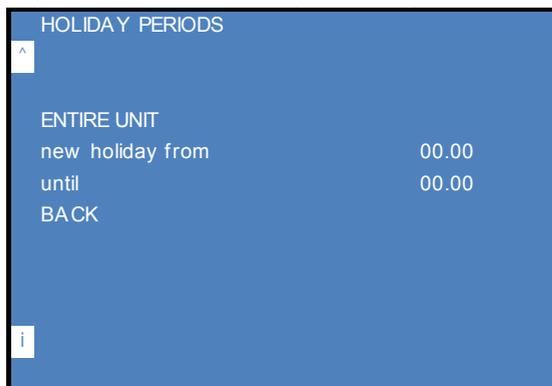
Room:			
Day of the week	Temperatures and periods		
	°C	°C	°C
Monday	:- :	:- :	:- :
Tuesday	:- :	:- :	:- :
Wednesday	:- :	:- :	:- :
Thursday	:- :	:- :	:- :
Friday	:- :	:- :	:- :
Saturday	:- :	:- :	:- :
Sunday	:- :	:- :	:- :
	In between:	°C	(setback temperature)

Room:			
Day of the week	Temperatures and periods		
	°C	°C	°C
Monday	:- :	:- :	:- :
Tuesday	:- :	:- :	:- :
Wednesday	:- :	:- :	:- :
Thursday	:- :	:- :	:- :
Friday	:- :	:- :	:- :
Saturday	:- :	:- :	:- :
Sunday	:- :	:- :	:- :
	In between:	°C	(setback temperature)

›HOLIDAY PERIODS‹ menu


(Example, depending on the selected system)

In the ›HOLIDAY PERIODS‹ menu, first select whether the setting is to apply to the entire system or only to the individual heating circuit.



- Enter the start and end dates for the holiday.
“Change values” on page 23

Notes:

To delete a holiday period, enter the date 00.00.

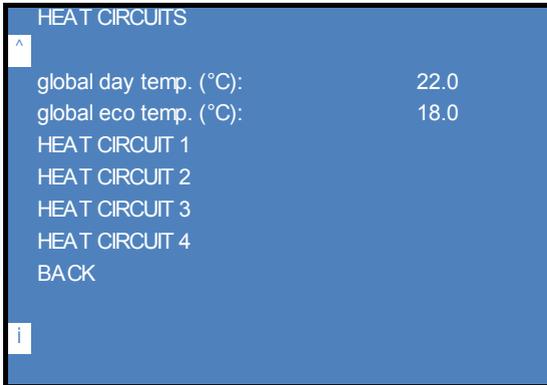
More than 10 holiday periods can be set for the entire system, for a single heating circuit, however, only one.

On these holidays, the room temperature is controlled to the frost protection room temperature. See “Operating mode ›FROST PROTECTION‹” on page 28.

On the last day of a holiday period, the room temperature is controlled to the setback temperature.

If a programmed holiday period has passed, the entry is automatically deleted.

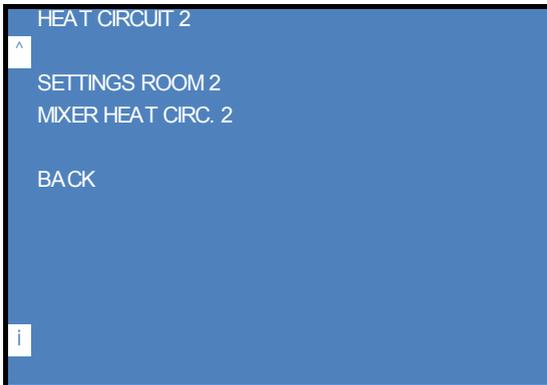
›HEAT CIRCUITS‹ menu



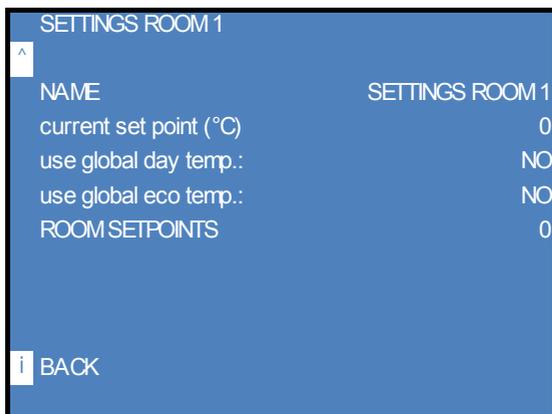
(Example, depending on the selected system)

The ›HEAT CIRCUITS‹ menu shows the global set points and a selection of heating circuits.

- Change the global values applicable to all heating circuits, if necessary.
›global day temp.(°C)‹ = Global setpoint day room temperature for heating periods
›global eco temp.(°C)‹ = Global setpoint night room temperature for setback periods
- Select a heating circuit, e.g. ›HEAT CIRCUIT 2‹ .
Make the settings for the other heating circuits accordingly.



- Select ›SETTINGS ROOM 2‹ in the ›HEAT CIRCUIT 2‹ menu.
(Example, depending on the selected system)

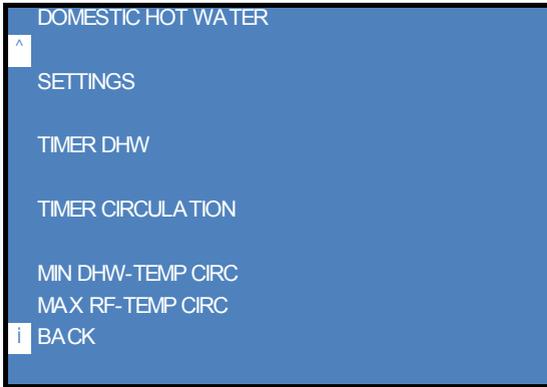


- Change the name of this temperature sensor if necessary.
- Change the setpoint temperature for this heating circuit, if necessary.
“Change values” on page 23

For further settings, see “>HEAT CIRCUITS< menu (Installer)” on page 130



›DOMESTIC HOT WATER‹ menu

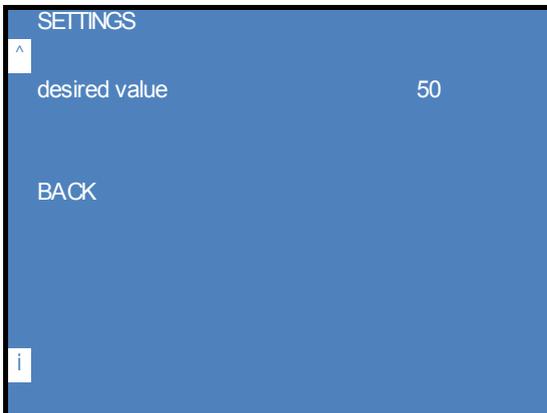


In the ›DOMESTIC HOT WATER‹ menu you can define the set temperature, the heating times and, if necessary, the circulation times.

For further settings, see “›DOMESTIC HOT WATER‹ menu (Installer)” on page 135

Setting the domestic hot water setpoint temperature

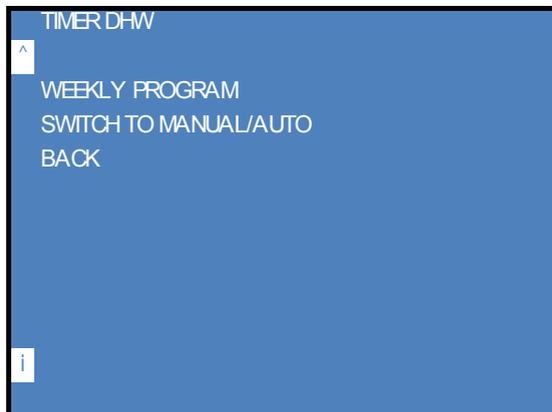
- Select ›SETTINGS‹ in the ›DOMESTIC HOT WATER‹ menu.



- Change the ›desired value‹ (in °C) if necessary.
“Change values” on page 23

Setting the domestic hot water heating times

- To set the heating times, select ›TIMER DHW‹ in the ›DOMESTIC HOT WATER‹ menu.



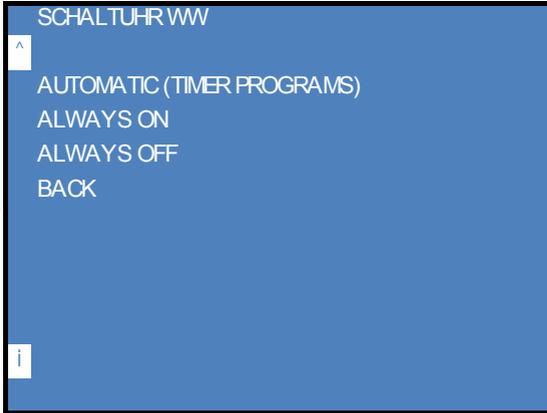
- You can change the heating times via ›WEEKLY PROGRAM‹.



- You can define up to three heating times and temperatures for each day of the week. No heating is used for all times in between. If you set the time from 00:00 to 00:00, the system will not be controlled at this time. You can enter the times in steps of 1 minute, the temperatures in steps of 1/10 degree. "Selecting the day of the week" on page 31 "›COPY DAY...‹" on page 31 "›COPY ALL VALUES...‹" on page 31
- You activate or deactivate the time switch via ›Weekly program: APPROVED‹.

Manual control of domestic hot water heating

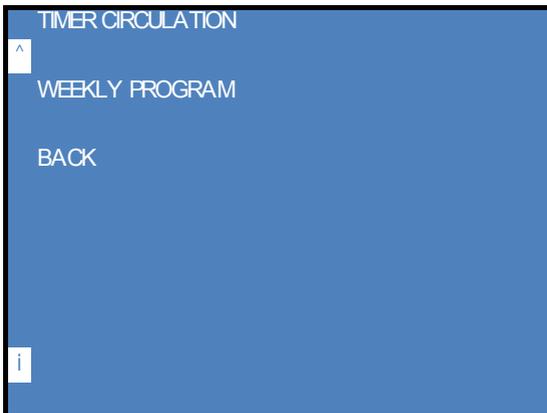
- To manually control the heating, select ›SWITCH TO MANUAL/AUTO‹ in the ›TIMER DHW‹ menu.



- Select the desired heating mode.

Setting circulation times

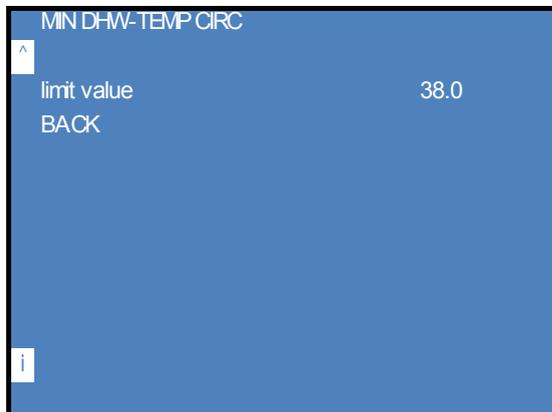
- To set the circulation times, select ›TIMER CIRCULATION‹ from the ›DOMESTIC HOT WATER‹ menu.



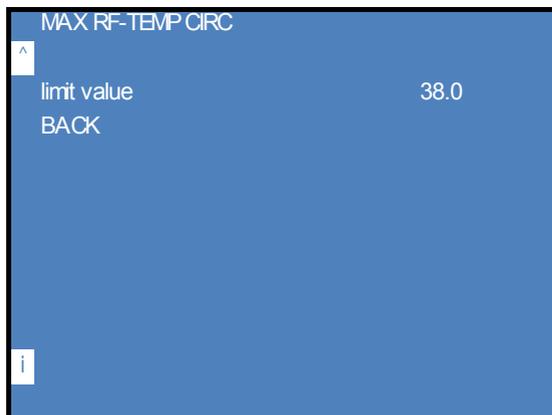
- You can change the circulation times via ›WEEKLY PROGRAM‹ in the same way as for "Setting the domestic hot water heating times" on page 39.

Configure circulation temperatures

- Select ›MIN DHW-TEMP CIRC‹ in the ›DOMESTIC HOT WATER‹ menu.



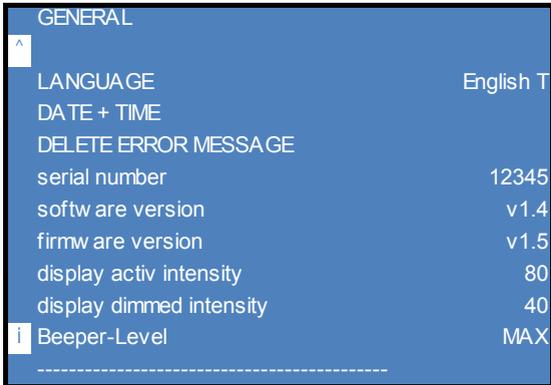
- Change the ›limit value‹ if necessary.
 Minimum storage tank temperature for release of circulation
 Circulation setpoint temperature: 38.0 °C (setting range: 0.0 - 95.0)
 “Change values” on page 23
- Select ›MAX RF TEMP CIRC‹ in the ›DOMESTIC HOT WATER‹ menu.



- Change the ›limit value‹ if necessary.
 Maximum temperature in the return line of the circulation
 Temperature for stopping the circulation: 38.0 °C (setting range 0.0 - 85.0)
 “Change values” on page 23

If the temperature in the return line of the circulation is higher than the set limit value, the circulation pump is switched off. (The circulation system is flushed.)

›GENERAL‹ menu

A screenshot of the '›GENERAL‹' menu on a blue background. At the top left is a small white square with a black triangle pointing up. The menu items are listed on the left, and their current values are on the right. At the bottom left is a small white square with a lowercase 'i' in a black circle, followed by the word 'Beeper-Level'.

GENERAL	
LANGUAGE	English T
DATE + TIME	
DELETE ERROR MESSAGE	
serial number	12345
software version	v1.4
firmware version	v1.5
display activ intensity	80
display dimmed intensity	40
Beeper-Level	MAX

In the ›GENERAL‹ menu you can view information about Userinterface and change general settings.

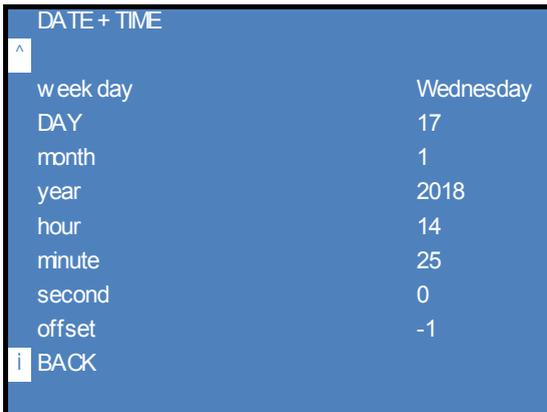
For further settings, see “›GENERAL‹ menu (Installer)” on page 140

Setting the language of the menu

- Change the language via ›LANGUAGE‹ if necessary.
“Change values” on page 23

Set date and time

- Select ›DATE + TIME‹ in the ›GENERAL‹ menu.

A screenshot of the '›DATE + TIME‹' menu on a blue background. At the top left is a small white square with a black triangle pointing up. The menu items are listed on the left, and their current values are on the right. At the bottom left is a small white square with a lowercase 'i' in a black circle, followed by the word 'BACK'.

DATE + TIME	
week day	Wednesday
DAY	17
month	1
year	2018
hour	14
minute	25
second	0
offset	-1
BACK	

- Set the current date and time.
›offset: The time zone can be set here.
“Change values” on page 23

Note: The date and time must be reset after a long power failure.

Adjusting the display brightness and buzzer volume

display activ intensity	80
display dimmed intensity	40
 Beeper-Level	MAX

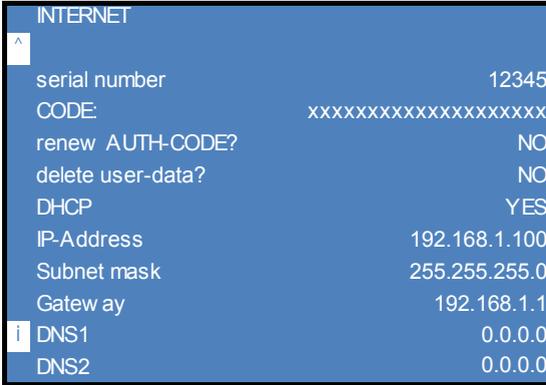
In the ›GENERAL‹ menu you can adjust the brightness of the LCD display and the volume of the buzzer:

- ›display active intensity‹: Brightness during operation
- ›display dimmed intensity‹: Brightness in standby mode
- ›Beeper-Level‹: Alarm volume in case of error messages

“Change values” on page 23



›INTERNET‹ menu



The screenshot shows a blue menu titled 'INTERNET' with a list of settings. A small white house icon is visible on the left side of the page. The settings are as follows:

Setting	Value
serial number	12345
CODE:	xxxxxxxxxxxxxxxxxxxxxx
renew AUTH-CODE?	NO
delete user-data?	NO
DHCP	YES
IP-Address	192.168.1.100
Subnet mask	255.255.255.0
Gateway	192.168.1.1
DNS1	0.0.0.0
DNS2	0.0.0.0

In the ›INTERNET‹ menu you can view and change the network settings of the Userinterface.

“Change values” on page 23

For further settings, see “›INTERNET‹ menu (Installer)” on page 143

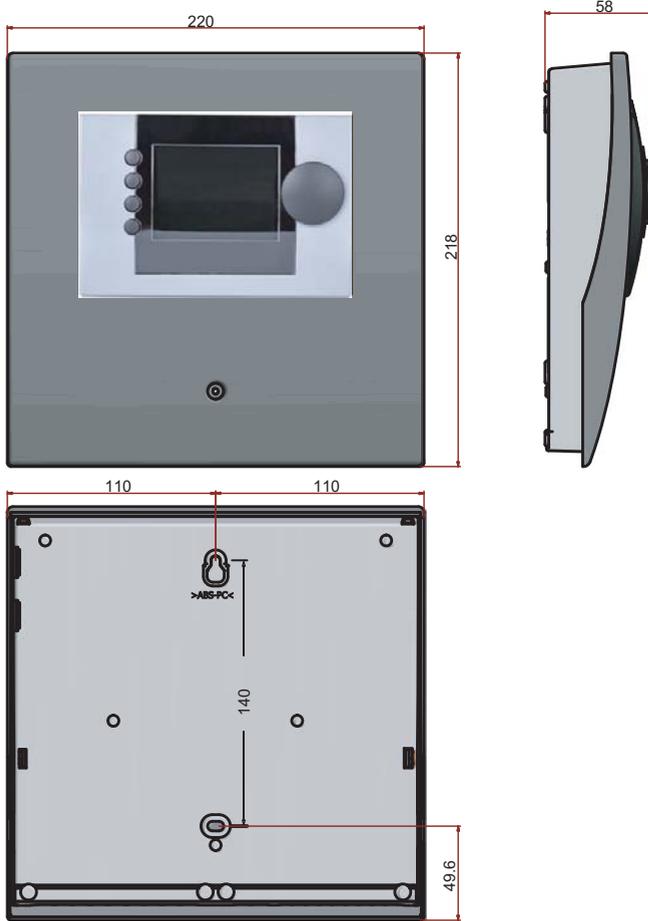
Installation and connection

 DANGER	
	<p>Electrical hazard</p> <p>Danger of death by electrocution!</p> <p>Before performing any work on the terminals, make sure you completely disconnect all poles of the power supply and secure them against being switched on again!</p>
NOTE	<p>Externally secure the consumers that are connected to the potential-free relay outputs according to their power consumption.</p> <p>The fuse in the controller only protects the electronic components!</p> <p>The total load of all pumps or mixers connected to a controller must not exceed 6 A.</p> <p>Use flexible connecting cables (stranded wires) only!</p>



smart Econ HCW

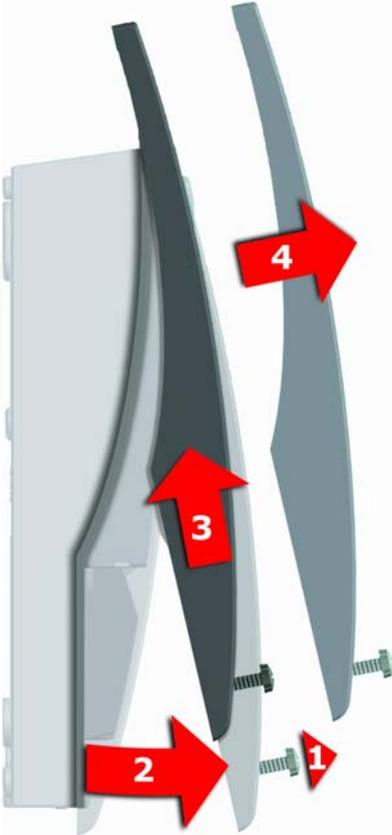
Dimensions smart Econ HCW



(dimensions in millimeters)



Opening the smart Econ HCW housing



- 1 Release the lock screw.
- 2 Swing terminal cover forward ...
- 3 ... push it upwards ...
- 4 ... and remove it.

Store the terminal cover carefully and protect it against damage!

To close the terminal cover, reverse the opening procedure.

Installation location smart Econ HCW

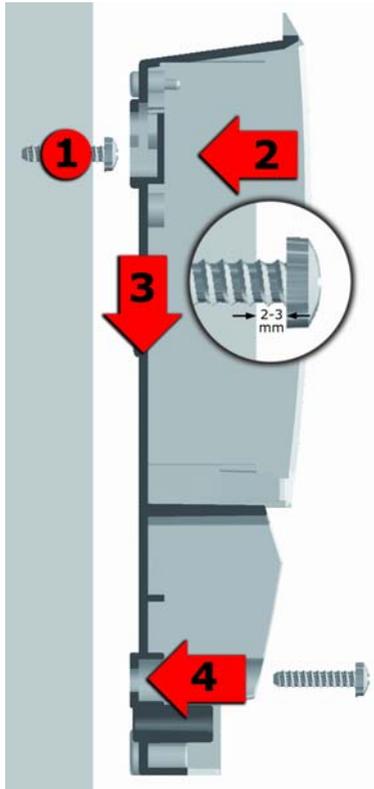
- In an easily accessible place
- Usual installation height: Display at user eye level

When used for temperature measurement:

- The device must not be exposed to external heat. (Waste heat from electrical appliances, waste heat from lighting, heated walls, via radiators, etc.)

Installation smart Econ HCW

<p>NOTE</p>	<p>Do not use the housing base as drill template. A device with damaged housing must not be operated!</p>
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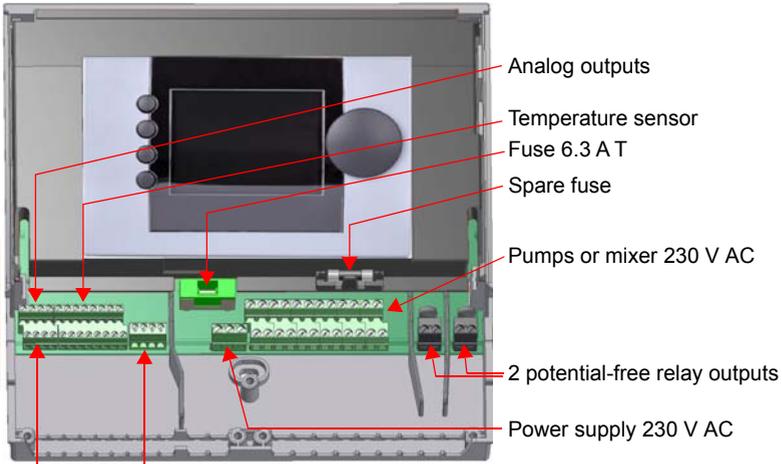
Screw the shell to the intended installation site.
If necessary, use dowels for wall mounting.

- 1 Fasten the top securing screw so that a space of 2 to 3 mm is created between the wall and the screw head.
- 2 Move the device so that the upper fastening port is located above the screw head...
- 3 ... and push it downwards.
- 4 Fasten the lower securing screw.



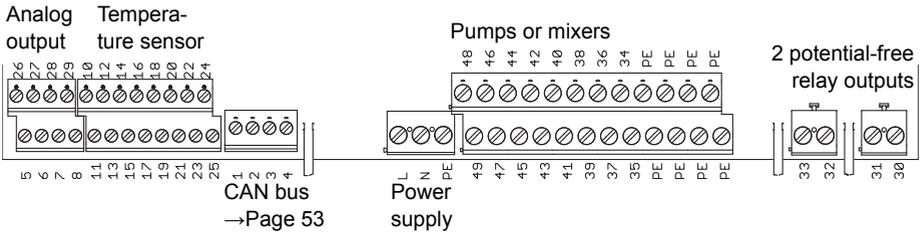
Connection smart Econ HCW

Position of the terminals:



Vortex sensor (no function)
CAN bus → Page 53

Terminal numbers:



“Hydraulic systems and connection diagrams” on page 56

smart Econ Room controller

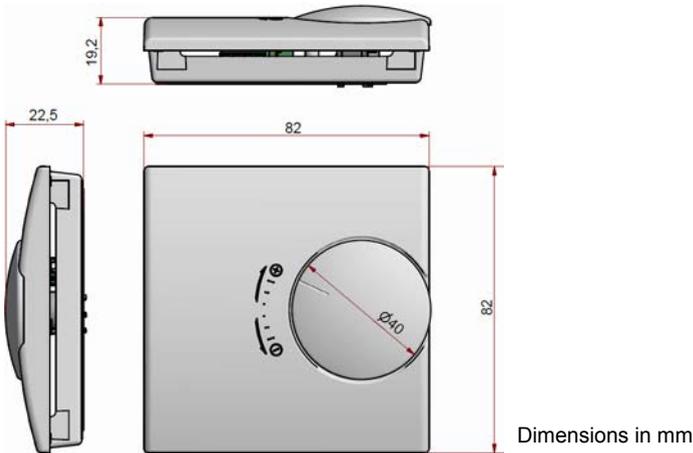
Node number room controller

A multi-digit number is glued on the packaging, on the back of the housing and on the terminal inside. This is the CAN account number, a unique, unmistakable number, similar to a serial number. One room controller can be installed per heating circuit in a system.

Each room controller has an individual node number and must be logged into the controller as a bus device by entering this number, see "Configuring the room controller ›CONFIG RC‹" on page 123.

Make a note of the node numbers!

Dimensions room controller



Opening the room controller housing

First remove the hand wheel, then remove the cover at each corner until the snap lock is unlocked. To assemble, proceed in reverse order.

Installation location room controller

- As a heating circuit remote control in a reference room.
- As an individual room controller in the respective room.
- Usual installation height: approx. 130 to 140 cm above the top edge of the finished floor.
- Never expose a smart Econ room controller to other heat sources. Ensure that the installation site is draft-free. External heat sources could be, for example, direct sunlight, heat generated by electric equipment, heat radiating from lights (halogen spotlights!), heated walls or radiators near the system, etc.
- Install smart Econ room controllers in a freely accessible place to ensure that its regulatory functions work properly.

Installation room controller

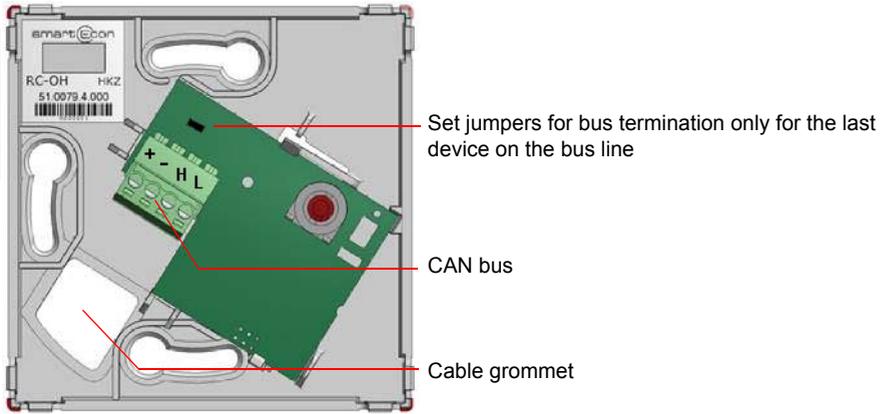
Screw smart Econ the room controller directly onto a flush-mounted or cavity wall switch box (hole spacing 60 mm).

Wall mounting directly above an empty conduit is not recommended.

Room controller connection

The smart Econ room controller is connected to the serial CAN bus.

If a room controller is the last device on a bus line, the jumper for the bus termination must be set. The jumper must be pulled for all devices in between.



Connection CAN-Bus

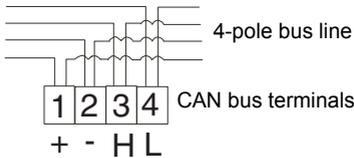
All devices must be connected in the following sequence.No branches are allowed.

4-pole STP or FTP cable, e.g. J-Y(ST)Y 2 x 2 x 0.6 mm², is recommended as bus cable.

With cables of a correspondingly high quality, the total length of the bus cable can even be several hundred meters, whereby approx. 20-25 m must be subtracted for each terminal point.

For short distances and sufficient distance (min. 30 cm) to lines carrying mains voltage, unshielded UTP cable (unshielded twisted pair) can also be used.

NOTE	It is important to ensure good grounding of the shielding, as otherwise the shield can act as an antenna and even amplify interference on the bus in case of faulty installation, e.g. by cutting off the shielding foil or the mains.
-------------	--



- (1) + = Vss
- (2) - = GND
- (3) H = CAN High
- (4) L = CAN Low

Cable routing

Lay the following cables:

- 4-pole CAN bus line: serial between smart Econ HCW and room controller with HCW 810, between base unit - Expansion module - Room controller for HCW 1620
"CAN bus line" on page 15

- Power cable to smart Econ HCW

Optional for networking:

- Ethernet cable to smart Econ Userinterface

Optional configuration:

- USB cable (USB-A / Micro-USB-B) to smart Econ Userinterface

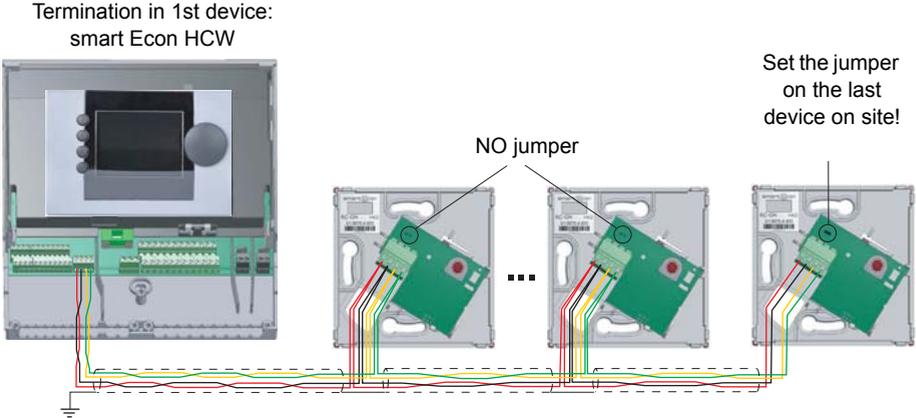
4-pole CAN bus line

The first device on the CAN bus line must be smart Econ HCW. (The CAN bus of the smart Econ HCW is already factory terminated, the terminating resistor is permanently installed.)

A jumper must be inserted on the last device of the CAN bus line. It is irrelevant at which device the bus line ends.

Avoid junctions!

Example:



Tip: Never connect more than two cables under one terminal, and only one cable may be connected between two devices at a time. This automatically results in a serial cable routing.

Internet-based network

The Ethernet LAN interface can be used to establish a connection to the Internet via a router.

Prerequisites

- Available network connection, establish one if necessary.
- Working network structure
- Static IPv4 address in the home network or router with DHCP server (usually included in standard routers)
- External access must be configured

NOTE	Router and connection technology has to be provided. The delivery only includes the smart Econ components.
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Hydraulic systems and connection diagrams

NOTE	<p>Determine the structure and structure of the system when planning the entire thermal system and compare the design with the hydraulic system of the heating system controller!</p> <p>Observe the terminal assignment stored in the selected system, as this differs from system to system.</p>
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NOTE	<p>The listed systems are NOT assembly instructions and are incomplete, especially with regard to necessary safety devices and other components (valves, check valves etc.).</p>
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After entering the installer code, in the menu ›INSTALLER‹ - ›COMMISSIONING‹ - ›cur. scheme‹ select one of the following systems that best fits your setup. “Select hydraulic system” on page 111

Further hydraulic systems

Provides a configured system with more functions than are required for your system (e.g. 3 heating circuits, although your system has only 2 heating circuits, or no solar system connected):

- Deactivate the non-existent temperature sensors in the ›SENSOR ADJUSTING‹ menu. “Sensor adjustment” on page 121
- Deactivate the non-existent pumps and mixers in the respective menus of the heating circuits or heat generators.

Note: Only 'non-critical' components can be deactivated, i.e. only sensors and pumps/mixers that are not absolutely necessary for the selected system.

Example: Hydraulic system 10 results from hydraulic system 8: ›HCW 008 Sol‹ by deactivating the temperature sensor and the pump for the solar system.

- In ›Curr. System‹ in the ›COMMISSIONING‹ menu, select the hydraulic system ›HCW 008 Sol‹. “Select hydraulic system” on page 111
- In the menu ›COMMISSIONING‹ - ›SENSOR ADJUSTING‹ - ›collector temp.‹ deactivate the non-existent sensor via ›activated: NO‹. “Sensor adjustment” on page 121
- In the menu ›COMMISSIONING‹ - ›SOLAR UNIT‹ - ›PUMP SETTINGS‹ deactivate the non-existent pump via ›activated: NO‹. “Configure solar system” on page 117

This deactivates the functioning of the solar system.

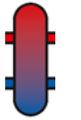
Hydraulic symbols

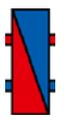
 Flow line
 Return line

 Pump

 Mixer

 Heating circuit

 Hydraulic separator

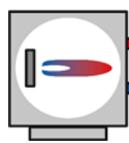
 Plate heat exchangers

 Domestic hot water

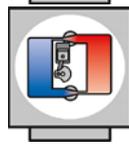
 Solar collector panel

 Temperature sensor

 Outdoor temperature sensor

 Boiler, e.g. fossil fueled

 Solid fuel boilers

 Heat pump

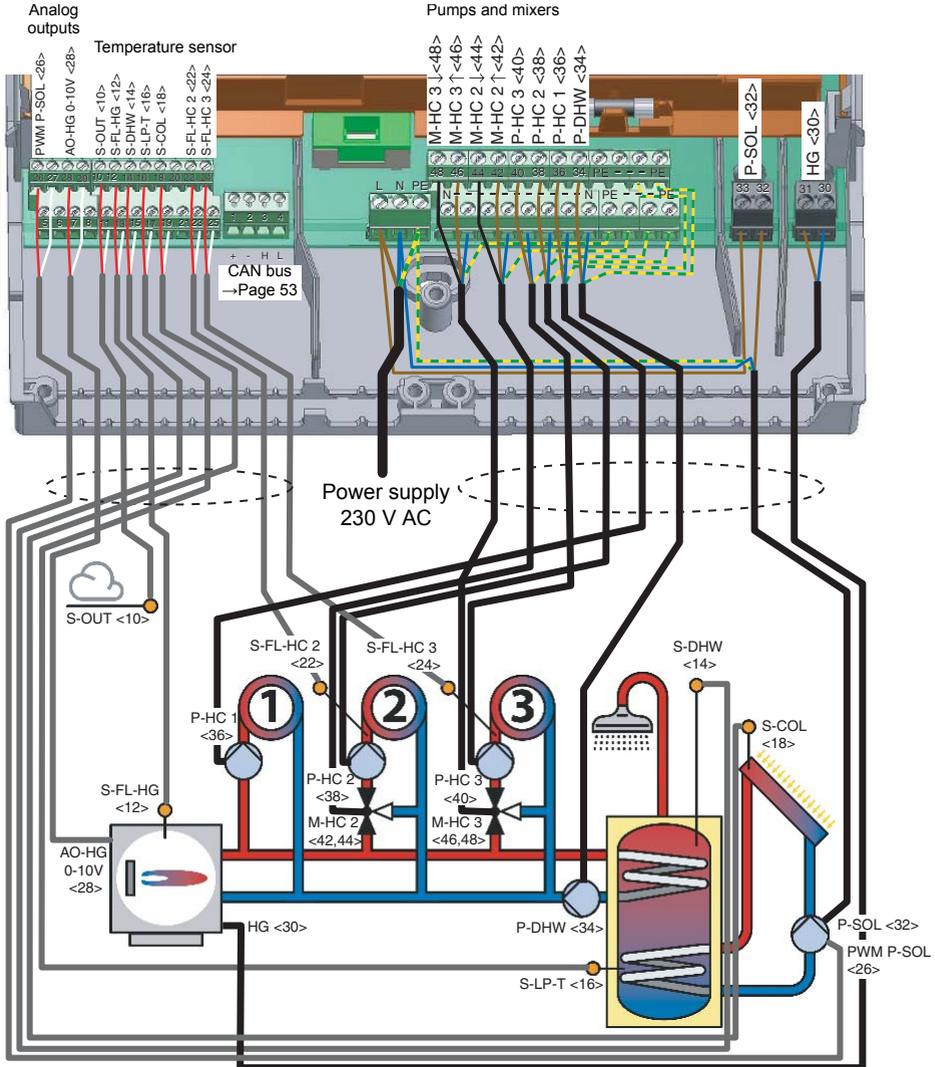
 Hot water storage tank with heat exchanger



Hydraulic system 1: »HCW 001 Sol« (HCW 810)

1 heat generator, 1 heating circuit without mixer, 2 heating circuits with mixer, 1 solar collector, 1 domestic hot water tank

Required sensors (PT 1000): 1 outdoor temperature sensor, 2 solar and boiler temperature sensors, 2 storage tank and buffer temperature sensors, 2 flow/return contact temperature sensors



Terminals	Abbreviation	Description
6,7	-	-
8,9	-	-
10,11	S-OUT <10>	outdoor temp. <10>
12,13	S-FL-HG <12>	flow heat gen. <12>
14,15	S-DHW <14>	domest. hot water <14>
16,17	S-LP-T <16>	lower tank <16>
18,19	S-COL <18>	collector temp. <18>
20,21	-	-
22,23	S-FL-HC 2 <22>	flow heat circ. 2 <22>
24,25	S-FL-HC 3 <24>	flow heat circ. 3 <24>
26,27	PWMP-SOL <26>	PWM pump solar <26>
28,29	AO-HG 0-10V <28>	Signal HG 0-10V <28>
30,31	HG <30>	Heat Generator <30>
32,33	P-SOL <32>	pump solar <32>
34,35	P-DHW <34>	pump dhw <34>
36,37	P-HC 1 <36>	pump heat circ. 1 <36>
38,39	P-HC 2 <38>	pump heat circ. 2 <38>
40,41	P-HC 3 <40>	pump heat circ. 3 <40>
42,43	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
44,45	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE
46,47	M-HC 3 AUF	MIXER HEAT CIRC. 3 OPEN
48,49	M-HC 3 ZU	MIXER HEAT CIRC. 3 CLOSE

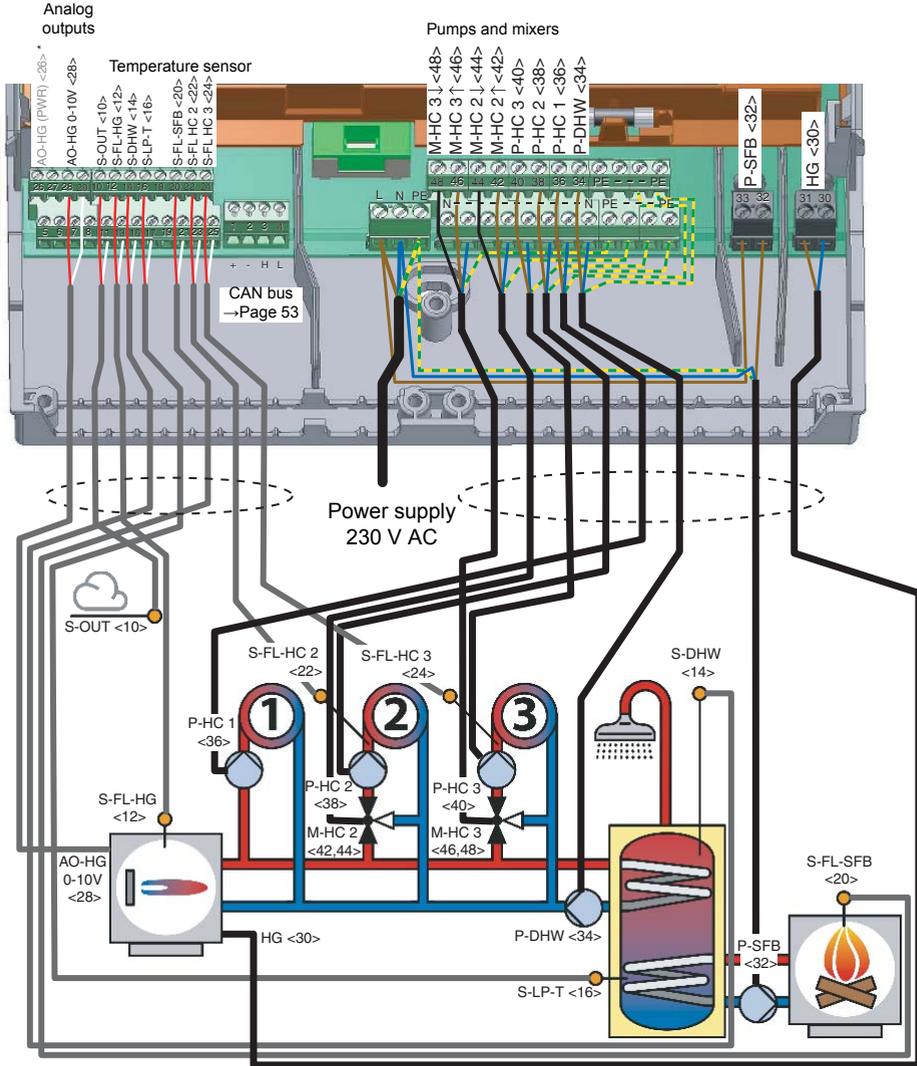
"Abbreviations for hydraulic components, inputs and outputs" on page 100

Hydraulic system 2: »HCW 002 SF« (HCW 810)

1 heat generator, 1 solid fuel boiler, 1 heating circuit without mixer, 2 heating circuits with mixer, 1 domestic hot water tank

Required sensors (PT 1000): 1 outdoor temperature sensor, 2 solar and boiler temperature sensors, 2 storage tank and buffer temperature sensors, 2 flow/return contact temperature sensors

* Bumer modulation via 0-10 V output at terminals 28 is possible on request.



Terminals	Abbreviation	Description
6,7	-	-
8,9	-	-
10,11	S-OUT <10>	outdoor temp. <10>
12,13	S-FL-HG <12>	flow heat gen. <12>
14,15	S-DHW <14>	domest. hot water <14>
16,17	S-LP-T <16>	low er tank <16>
18,19	-	-
20,21	S-FL-SFB <20>	flow sol fuel gen. <20>
22,23	S-FL-HC 2 <22>	flow heat circ. 2 <22>
24,25	S-FL-HC 3 <24>	flow heat circ. 3 <24>
26,27	-	-
28,29	AO-HG 0-10V <28>	Signal HG 0-10V <28>
30,31	HG <30>	Heat Generator <30>
32,33	P-SFB <32>	pump solid fuel <32>
34,35	P-DHW <34>	pump dhw <34>
36,37	P-HC 1 <36>	pump heat circ. 1 <36>
38,39	P-HC 2 <38>	pump heat circ. 2 <38>
40,41	P-HC 3 <40>	pump heat circ. 3 <40>
42,43	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
44,45	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE
46,47	M-HC 3 AUF	MIXER HEAT CIRC. 3 OPEN
48,49	M-HC 3 ZU	MIXER HEAT CIRC. 3 CLOSE

"Abbreviations for hydraulic components, inputs and outputs" on page 100

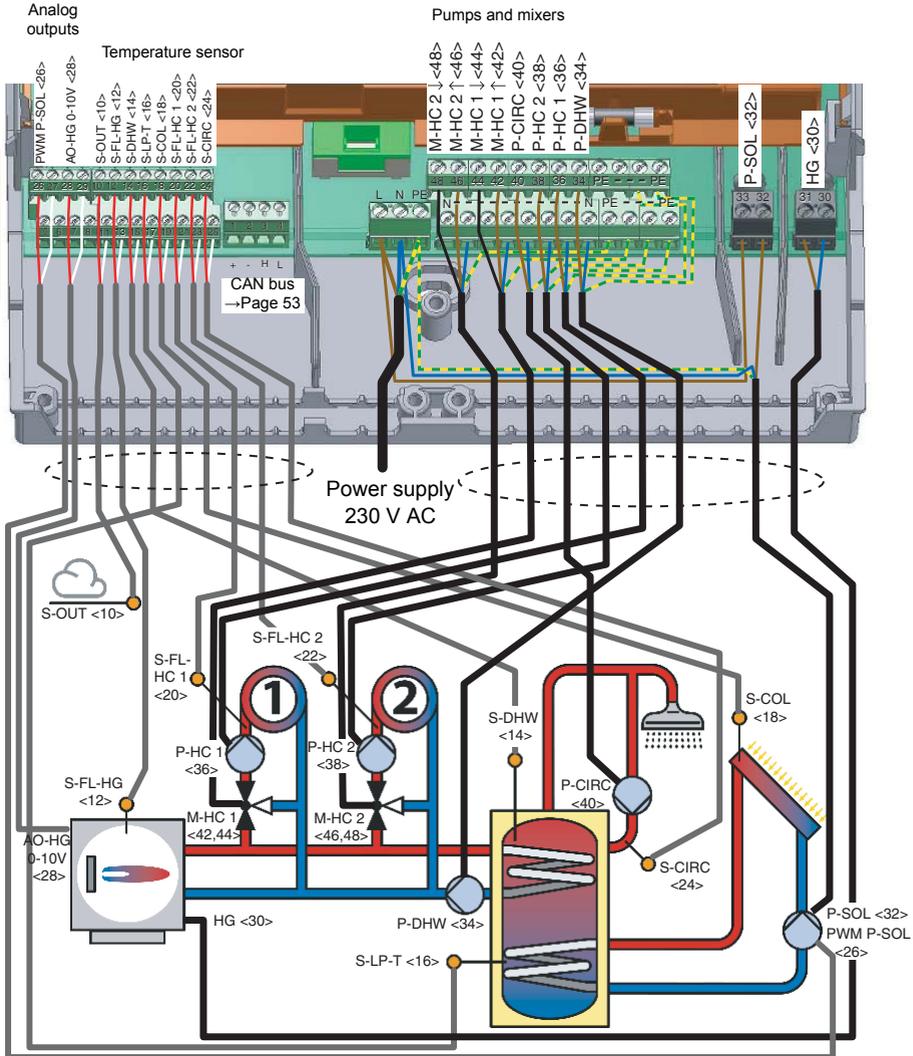
Terminals	Abbreviation	Description
6,7	-	-
8,9	-	-
10,11	S-OUT <10>	outdoor temp. <10>
12,13	S-FL-HG <12>	flow heat gen. <12>
14,15	S-DHW <14>	domest. hot water <14>
16,17	S-LP-T <16>	lower tank <16>
18,19	S-CIRC <18>	circulation <18>
20,21	-	-
22,23	S-FL-HC 2 <22>	flow heat circ. 2 <22>
24,25	S-FL-HC 3 <24>	flow heat circ. 3 <24>
26,27	-	-
28,29	AO-HG 0-10V <28>	Signal HG 0-10V <28>
30,31	HG <30>	Heat Generator <30>
32,33	P-CIRC <32>	pump circ. <32>
34,35	P-DHW <34>	pump dhw <34>
36,37	P-HC 1 <36>	pump heat circ. 1 <36>
38,39	P-HC 2 <38>	pump heat circ. 2 <38>
40,41	P-HC 3 <40>	pump heat circ. 3 <40>
42,43	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
44,45	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE
46,47	M-HC 3 AUF	MIXER HEAT CIRC. 3 OPEN
48,49	M-HC 3 ZU	MIXER HEAT CIRC. 3 CLOSE

"Abbreviations for hydraulic components, inputs and outputs" on page 100

Hydraulic system 4: HCW 004 Sol (HCW 810)

1 heat generator, 2 heating circuits with mixer, 1 solar collector, 1 domestic hot water tank, domestic hot water circulation

Required sensors (PT 1000): 1 outdoor temperature sensor, 2 solar and boiler temperature sensors, 2 storage tank and buffer temperature sensors, 3 flow/return contact temperature sensors



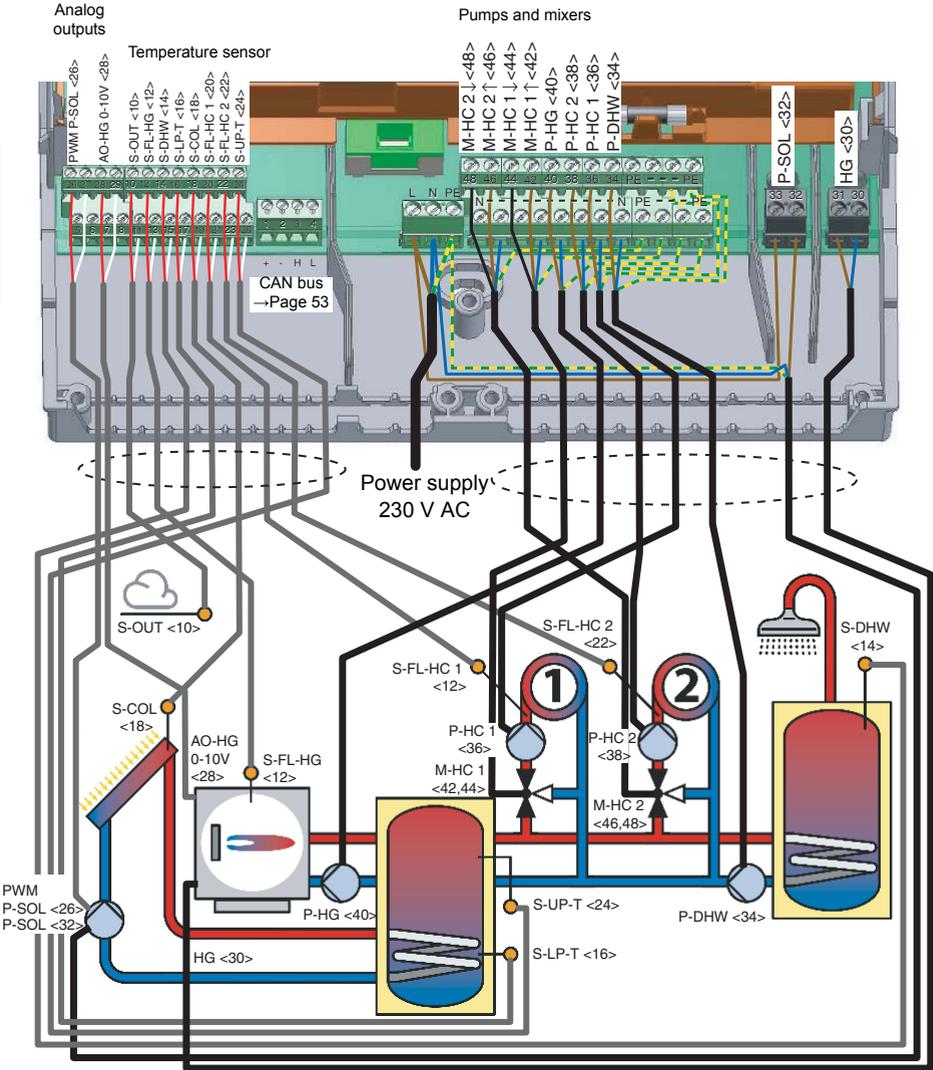
Terminals	Abbreviation	Description
6,7	-	-
8,9	-	-
10,11	S-OUT <10>	outdoor temp. <10>
12,13	S-FL-HG <12>	flow heat gen. <12>
14,15	S-DHW <14>	domest. hot water <14>
16,17	S-LP-T <16>	low er tank <16>
18,19	S-COL <18>	collector temp. <18>
20,21	S-FL-HC 1 <20>	flow heat circ. 1 <20>
22,23	S-FL-HC 2 <22>	flow heat circ. 2 <22>
24,25	S-CIRC <24>	circulation <24>
26,27	PWMP-SOL <26>	PWM pump solar <26>
28,29	AO-HG 0-10V <28>	Signal HG 0-10V <28>
30,31	HG <30>	Heat Generator <30>
32,33	P-SOL <32>	pump solar <32>
34,35	P-DHW <34>	pump dhw <34>
36,37	P-HC 1 <36>	pump heat circ. 1 <36>
38,39	P-HC 2 <38>	pump heat circ. 2 <38>
40,41	P-CIRC <40>	pump circ. <40>
42,43	M-HC 1 AUF	MIXER HEAT CIRC. 1 OPEN
44,45	M-HC 1 ZU	MIXER HEAT CIRC. 1 CLOSE
46,47	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
48,49	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 5: »HCW 005 Sol« (HCW 810)

1 heat generator, 2 heating circuits with mixer, 1 solar collector, 1 buffer tank, 1 domestic hot water tank

Required sensors (PT 1000): 1 outdoor temperature sensor, 2 solar and boiler temperature sensors, 3 storage tank and buffer temperature sensors, 2 flow/return contact temperature sensors



Terminals	Abbreviation	Description
6,7	-	-
8,9	-	-
10,11	S-OUT <10>	outdoor temp. <10>
12,13	S-FL-HG <12>	flow heat gen. <12>
14,15	S-DHW <14>	domest. hot water <14>
16,17	S-LP-T <16>	lower tank <16>
18,19	S-COL <18>	collector temp. <18>
20,21	S-FL-HC 1 <20>	flow heat circ. 1 <20>
22,23	S-FL-HC 2 <22>	flow heat circ. 2 <22>
24,25	S-UP-T <24>	upper tank <24>
26,27	PWMP-SOL <26>	PWM pump solar <26>
28,29	AO-HG 0-10V <28>	Signal HG 0-10V <28>
30,31	HG <30>	Heat Generator <30>
32,33	P-SOL <32>	pump solar <32>
34,35	P-DHW <34>	pump dhw <34>
36,37	P-HC 1 <36>	pump heat circ. 1 <36>
38,39	P-HC 2 <38>	pump heat circ. 2 <38>
40,41	P-HG <40>	pump heat gen. <40>
42,43	M-HC 1 AUF	MIXER HEAT CIRC. 1 OPEN
44,45	M-HC 1 ZU	MIXER HEAT CIRC. 1 CLOSE
46,47	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
48,49	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE

"Abbreviations for hydraulic components, inputs and outputs" on page 100

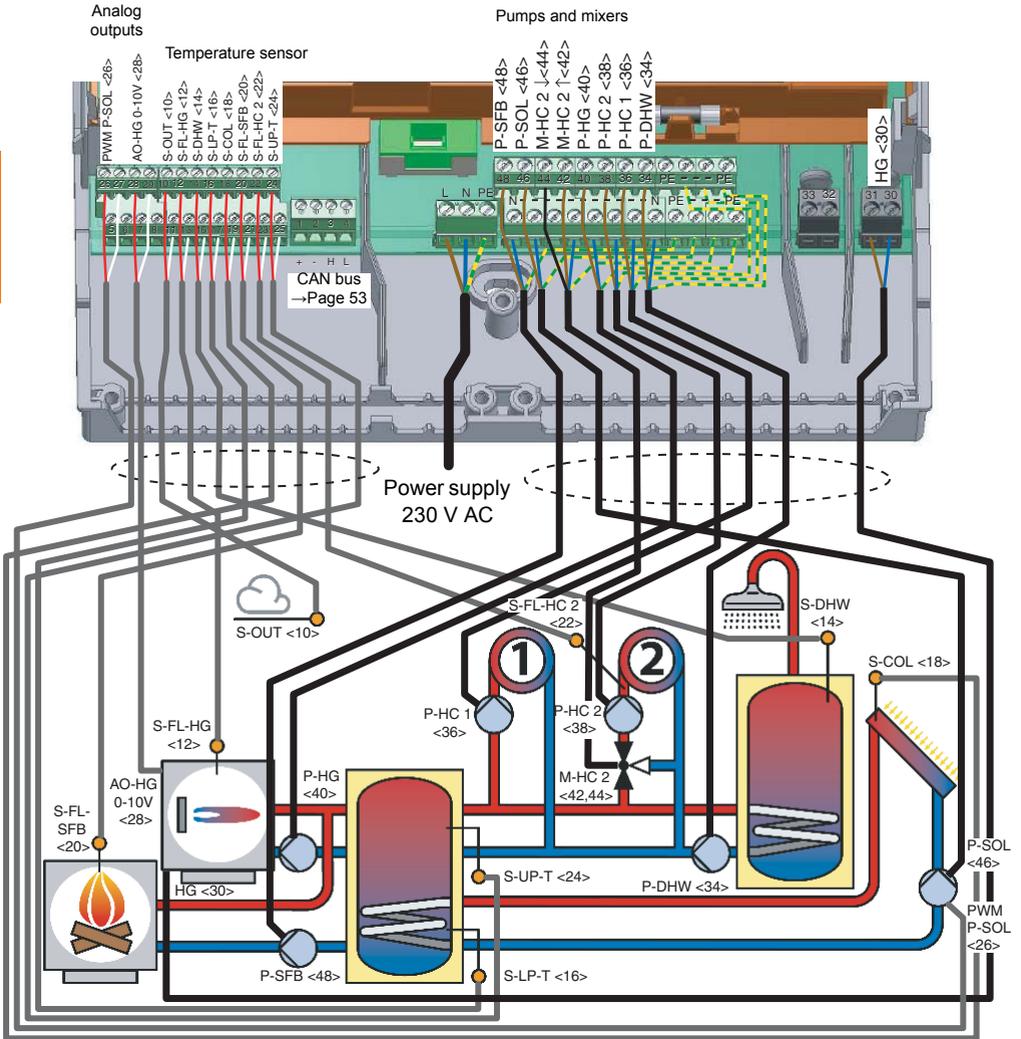
Terminals	Abbreviation	Description
6,7	-	-
8,9	-	-
10,11	S-OUT <10>	outdoor temp. <10>
12,13	S-FL-HG <12>	flow heat gen. <12>
14,15	S-DHW <14>	domest. hot water <14>
16,17	S-LP-T <16>	low er tank <16>
18,19	S-FL-HP <18>	flow heat pump <18>
20,21	S-FL-HC 1 <20>	flow heat circ. 1 <20>
22,23	S-FL-HC 2 <22>	flow heat circ. 2 <22>
24,25	S-MP-T <24>	middle tank <24>
26,27	AO-HG (PWR) <26>	PWR signal HG % <26>
28,29	AO-HG 0-10V <28>	Signal HG 0-10V <28>
30,31	HG <30>	Heat Generator <30>
32,33	HP <32>	heat pump <32>
34,35	P-HP <34>	pump heat pump <34>
36,37	P-HC 1 <36>	pump heat circ. 1 <36>
38,39	P-HC 2 <38>	pump heat circ. 2 <38>
40,41	P-HG <40>	pump heat gen. <40>
42,43	M-HC 1 AUF	MIXER HEAT CIRC. 1 OPEN
44,45	M-HC 1 ZU	MIXER HEAT CIRC. 1 CLOSE
46,47	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
48,49	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE

"Abbreviations for hydraulic components, inputs and outputs" on page 100

Hydraulic system 7: »HCW 007 Sol-SF« (HCW 810)

1 heat generator, 1 solid fuel boiler, 1 heating circuit with mixer, 1 heating circuit without mixer, 1 solar collector, 1 buffer tank, 1 domestic hot water tank

Required sensors (PT 1000): 1 outdoor temperature sensor, 3 solar and boiler temperature sensors, 3 storage tank and buffer temperature sensors, 1 flow/return contact temperature sensors



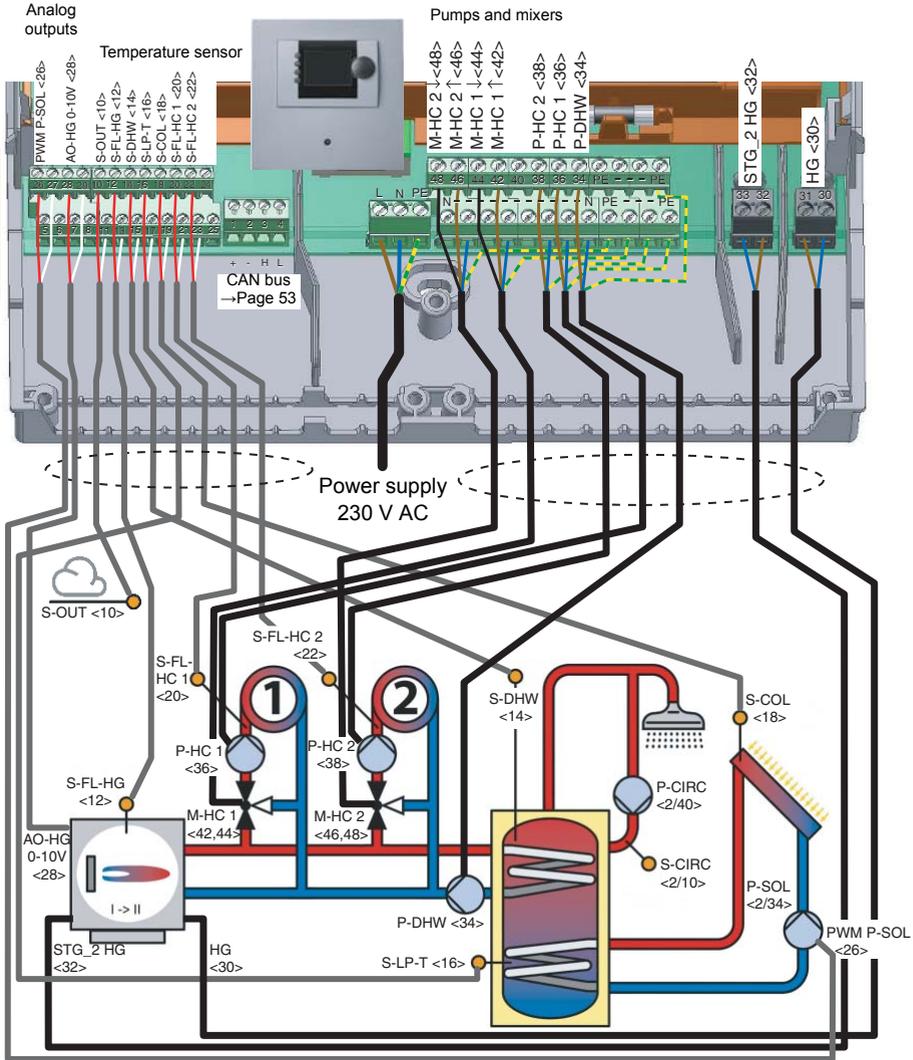
Terminals	Abbreviation	Description
6,7	-	-
8,9	-	-
10,11	S-OUT <10>	outdoor temp. <10>
12,13	S-FL-HG <12>	flow heat gen. <12>
14,15	S-DHW <14>	domest. hot water <14>
16,17	S-LP-T <16>	lower tank <16>
18,19	S-COL <18>	collector temp. <18>
20,21	S-FL-SFB <20>	flow sol fuel gen. <20>
22,23	S-FL-HC 2 <22>	flow heat circ. 2 <22>
24,25	S-UP-T <24>	upper tank <24>
26,27	PWP-SOL <26>	PWM pump solar <26>
28,29	AO-HG 0-10V <28>	Signal HG 0-10V <28>
30,31	HG <30>	Heat Generator <30>
32,33	-	-
34,35	P-DHW <34>	pump dhw <34>
36,37	P-HC 1 <36>	pump heat circ. 1 <36>
38,39	P-HC 2 <38>	pump heat circ. 2 <38>
40,41	P-HG <40>	pump heat gen. <40>
42,43	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
44,45	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE
46,47	P-SOL <46>	pump solar <46>
48,49	P-SFB <48>	pump solid fuel <48>

"Abbreviations for hydraulic components, inputs and outputs" on page 100

Hydraulic system 8: ›HCW 008 Sol‹ (HCW 1620 Base Unit)

1 two-stage heat generator, 4 heating circuits with mixer, 1 solar collector, 1 domestic hot water tank, domestic hot water circulation

Required sensors (PT 1000): 1 outdoor temperature sensor, 2 solar and boiler temperature sensors, 2 storage tank and buffer temperature sensors, 5 flow/return contact temperature sensors



Controller	Terminals	Abbreviation	Description
1	6,7	-	-
1	8,9	-	-
1	10,11	S-OUT <1/10>	outdoor temp. <1/10>
1	12,13	S-FL-HG <1/12>	flow heat gen. <1/12>
1	14,15	S-DHW <1/14>	domest. hot water <1/14>
1	16,17	S-LP-T <1/16>	low er tank <1/16>
1	18,19	S-COL <1/18>	collector temp. <1/18>
1	20,21	S-FL-HC 1 <1/20>	flow heat circ. 1 <1/20>
1	22,23	S-FL-HC 2 <1/22>	flow heat circ. 2 <1/22>
1	24,25	-	-
1	26,27	PWMP-SOL <1/26>	PWM pump solar <1/26>
1	28,29	AO-HG 0-10V <1/28>	Signal HG 0-10V <1/28>
1	30,31	HG <1/30>	Heat Generator <1/30>
1	32,33	STG_2 HG <1/32>	Stage_2 HG <1/32>
1	34,35	P-DHW <1/34>	pump dhw <1/34>
1	36,37	P-HC 1 <1/36>	pump heat circ. 1 <1/36>
1	38,39	P-HC 2 <1/38>	pump heat circ. 2 <1/38>
1	40,41	-	-
1	42,43	M-HC 1 AUF	MIXER HEAT CIRC. 1 OPEN
1	44,45	M-HC 1 ZU	MIXER HEAT CIRC. 1 CLOSE
1	46,47	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
1	48,49	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

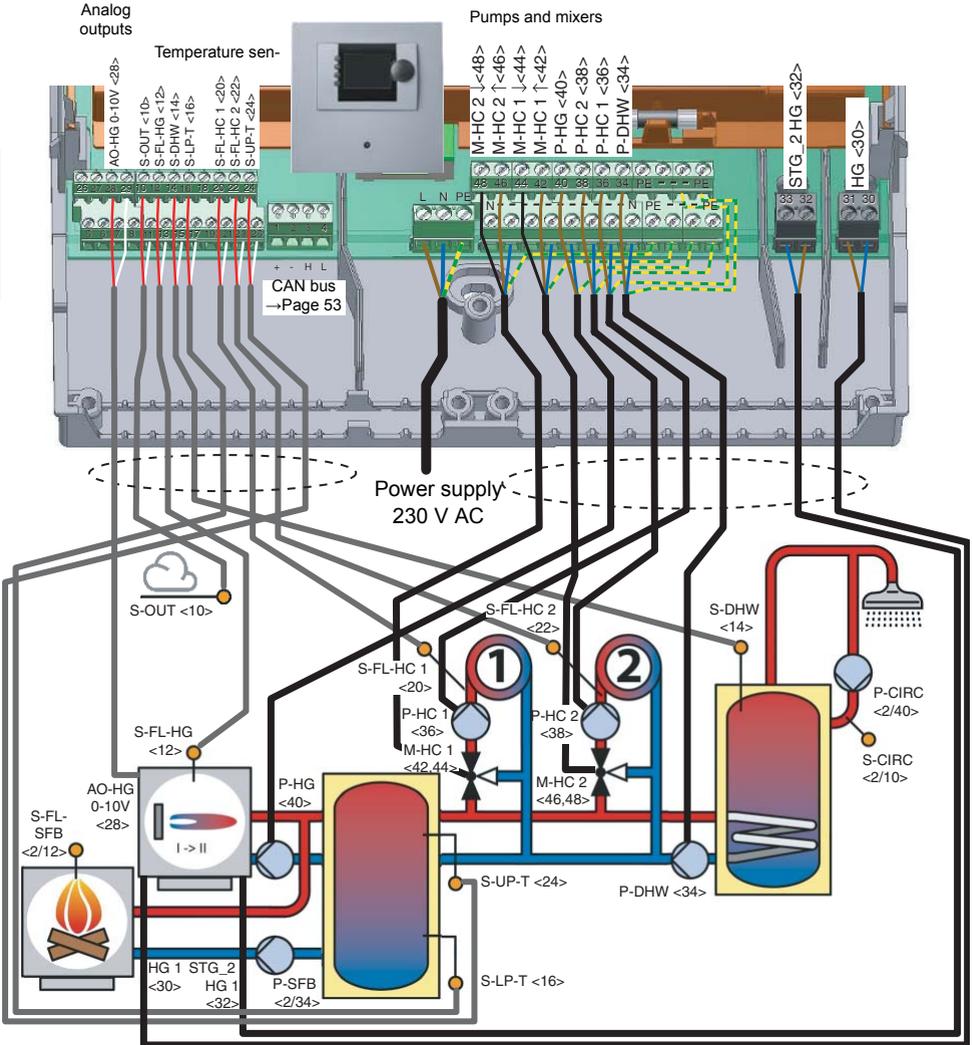
Controller	Terminals	Abbreviation	Description
2	6,7	-	-
2	8,9	-	-
2	10,11	S-CIRC <2/10>	circulation <2/10>
2	12,13	-	-
2	14,15	-	-
2	16,17	-	-
2	18,19	-	-
2	20,21	-	-
2	22,23	S-FL-HC 3 <2/22>	flow heat circ. 3 <2/22>
2	24,25	S-FL-HC 4 <2/24>	flow heat circ. 4 <2/24>
2	26,27	-	-
2	28,29	-	-
2	30,31	-	-
2	32,33	-	-
2	34,35	P-SOL <2/34>	pump solar <2/34>
2	36,37	P-HC 3 <2/36>	pump heat circ. 3 <2/36>
2	38,39	P-HC 4 <2/38>	pump heat circ. 4 <2/38>
2	40,41	P-CIRC <2/40>	pump circ. <2/40>
2	42,43	M-HC 3 AUF	MIXER HEAT CIRC. 3 OPEN
2	44,45	M-HC 3 ZU	MIXER HEAT CIRC. 3 CLOSE
2	46,47	M-HC 4 AUF	MIXER HEAT CIRC. 4 OPEN
2	48,49	M-HC 4 ZU	MIXER HEAT CIRC. 4 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 9: »HCW 009 SF« (HCW 1620 Base Unit)

1 two-stage heat generator, 1 solid fuel boiler, 4 heating circuits with mixer, 1 buffer tank, 1 domestic hot water tank, domestic hot water circulation

Required sensors (PT 1000): 1 outdoor temperature sensor, 2 solar and boiler temperature sensors, 3 storage tank and buffer temperature sensors, 5 flow/return contact temperature sensors

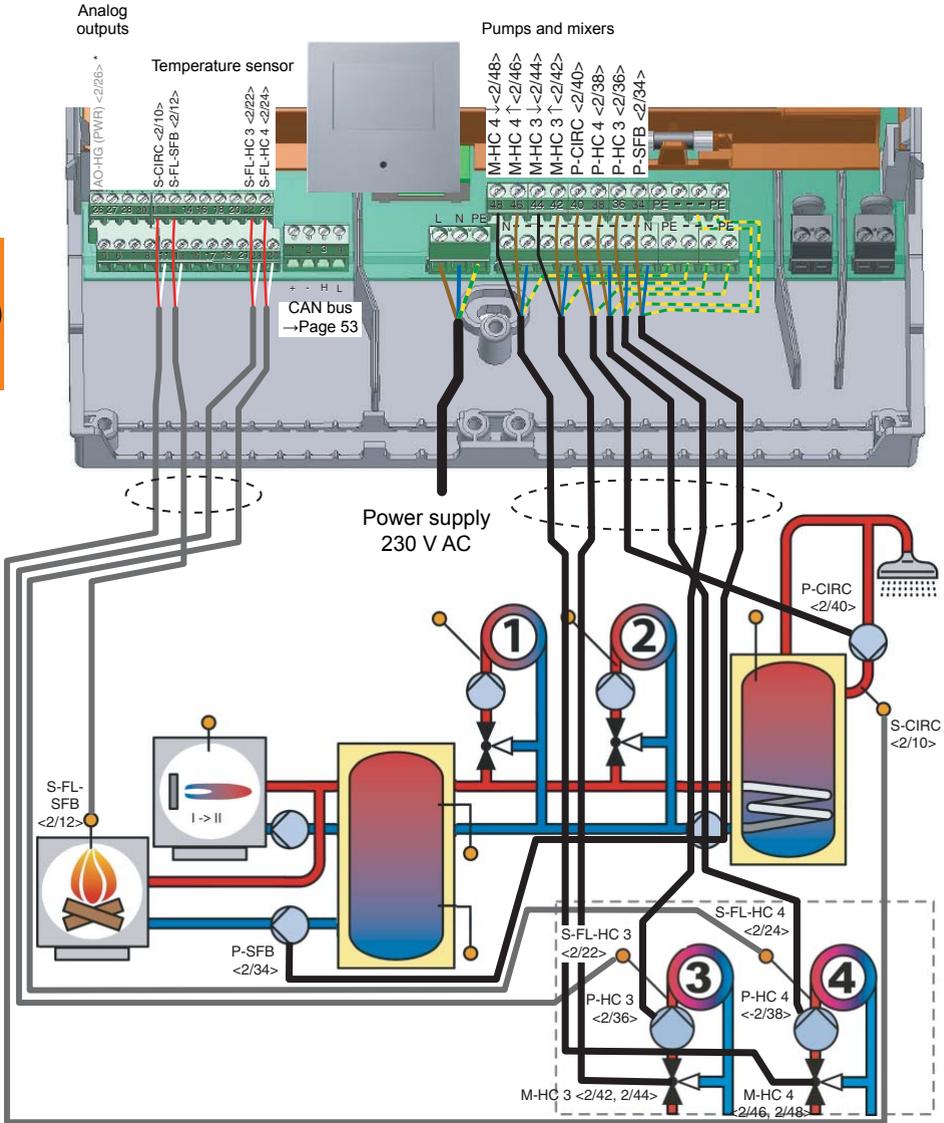


Controller	Terminals	Abbreviation	Description
1	6,7	-	-
1	8,9	-	-
1	10,11	S-OUT <1/10>	outdoor temp. <1/10>
1	12,13	S-FL-HG <1/12>	flow heat gen. <1/12>
1	14,15	S-DHW <1/14>	domest. hot water <1/14>
1	16,17	S-LP-T <1/16>	low er tank <1/16>
1	18,19	-	-
1	20,21	S-FL-HC 1 <1/20>	flow heat circ. 1 <1/20>
1	22,23	S-FL-HC 2 <1/22>	flow heat circ. 2 <1/22>
1	24,25	S-UP-T <1/24>	upper tank <1/24>
1	26,27	-	-
1	28,29	AO-HG 0-10V <1/28>	Signal HG 0-10V <1/28>
1	30,31	HG <1/30>	Heat Generator <1/30>
1	32,33	STG_2 HG <1/32>	Stage_2 HG <1/32>
1	34,35	P-DHW <1/34>	pump dhw <1/34>
1	36,37	P-HC 1 <1/36>	pump heat circ. 1 <1/36>
1	38,39	P-HC 2 <1/38>	pump heat circ. 2 <1/38>
1	40,41	P-HG <1/40>	pump heat gen. <1/40>
1	42,43	M-HC 1 AUF	MIXER HEAT CIRC. 1 OPEN
1	44,45	M-HC 1 ZU	MIXER HEAT CIRC. 1 CLOSE
1	46,47	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
1	48,49	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 9: »HCW 009 SF« (HCW 1620 Expansion Module)

* Burner modulation via 0-10 V output at terminals 28 is possible on request.



Controller	Terminals	Abbreviation	Description
2	6,7	-	-
2	8,9	-	-
2	10,11	S-CIRC <2/10>	circulation <2/10>
2	12,13	S-FL-SFB <2/12>	flow sol fuel gen. <2/12>
2	14,15	-	-
2	16,17	-	-
2	18,19	-	-
2	20,21	-	-
2	22,23	S-FL-HC 3 <2/22>	flow heat circ. 3 <2/22>
2	24,25	S-FL-HC 4 <2/24>	flow heat circ. 4 <2/24>
2	26,27	-	-
2	28,29	-	-
2	30,31	-	-
2	32,33	-	-
2	34,35	P-SFB <2/34>	pump solid fuel <2/34>
2	36,37	P-HC 3 <2/36>	pump heat circ. 3 <2/36>
2	38,39	P-HC 4 <2/38>	pump heat circ. 4 <2/38>
2	40,41	P-CIRC <2/40>	pump circ. <2/40>
2	42,43	M-HC 3 AUF	MIXER HEAT CIRC. 3 OPEN
2	44,45	M-HC 3 ZU	MIXER HEAT CIRC. 3 CLOSE
2	46,47	M-HC 4 AUF	MIXER HEAT CIRC. 4 OPEN
2	48,49	M-HC 4 ZU	MIXER HEAT CIRC. 4 CLOSE

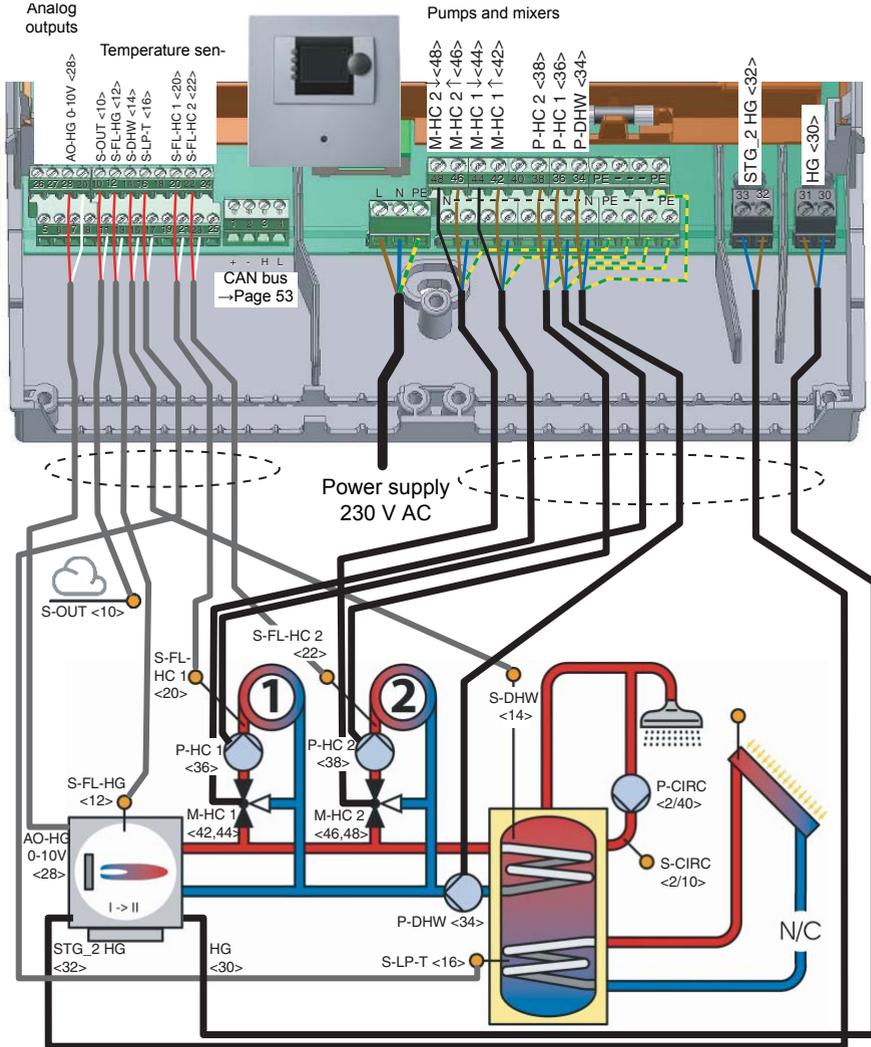
“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 10: »HCW 008 Sol« (HCW 1620 Base Unit)

(= Hydraulic system 8: »HCW 008 Sol« with solar collector not connected, see page 56)

1 two-stage heat generator, 4 heating circuits with mixer,
1 domestic hot water tank, domestic hot water circulation

Required sensors (PT 1000): 1 outdoor temperature sensor, 1 solar and boiler temperature sensors,
2 storage tank and buffer temperature sensors, 5 flow/return contact temperature sensors

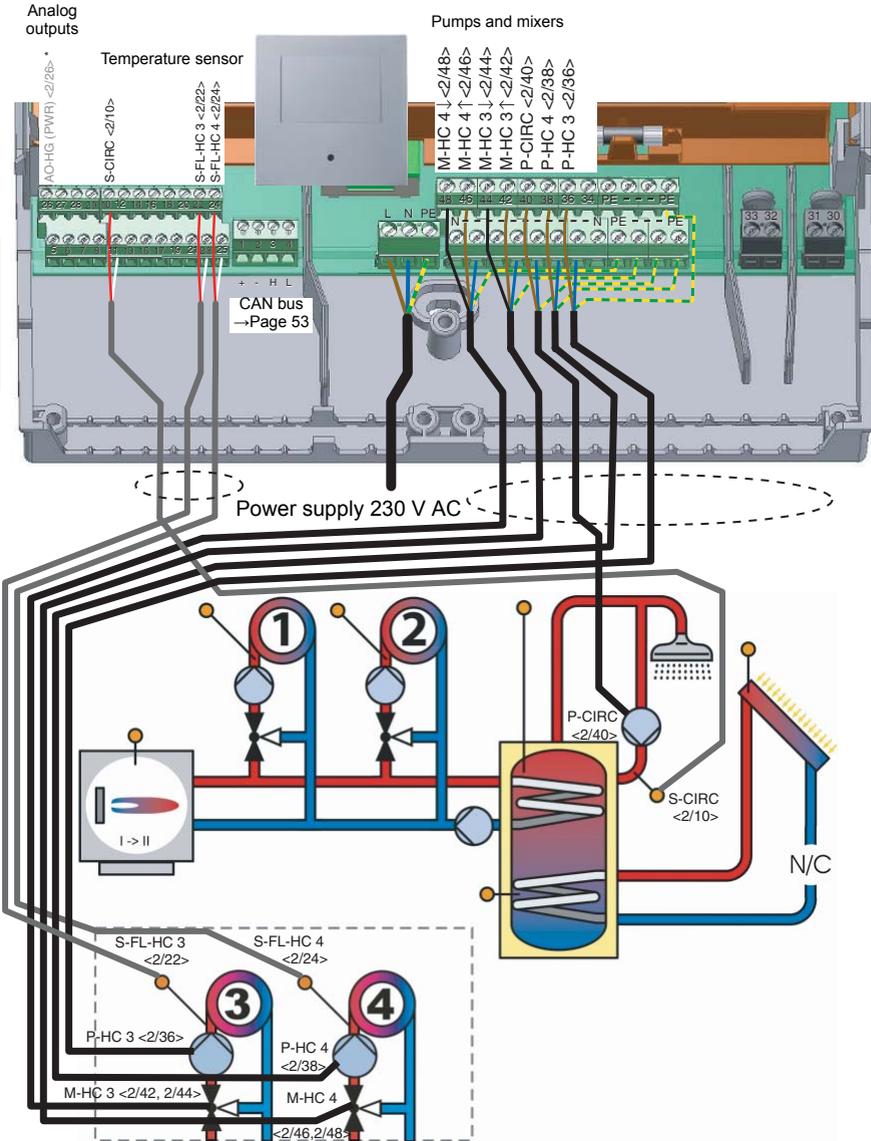


Controller	Terminals	Abbreviation	Description
1	6,7	-	-
1	8,9	-	-
1	10,11	S-OUT <1/10>	outdoor temp. <1/10>
1	12,13	S-FL-HG <1/12>	flow heat gen. <1/12>
1	14,15	S-DHW <1/14>	domest. hot water <1/14>
1	16,17	S-LP-T <1/16>	low er tank <1/16>
1	18,19	-	-
1	20,21	S-FL-HC 1 <1/20>	flow heat circ. 1 <1/20>
1	22,23	S-FL-HC 2 <1/22>	flow heat circ. 2 <1/22>
1	24,25	-	-
1	26,27	PWMP-SOL <1/26>	PWM pump solar <1/26>
1	28,29	AO-HG 0-10V <1/28>	Signal HG 0-10V <1/28>
1	30,31	HG <1/30>	Heat Generator <1/30>
1	32,33	STG_2 HG <1/32>	Stage_2 HG <1/32>
1	34,35	P-DHW <1/34>	pump dhw <1/34>
1	36,37	P-HC 1 <1/36>	pump heat circ. 1 <1/36>
1	38,39	P-HC 2 <1/38>	pump heat circ. 2 <1/38>
1	40,41	-	-
1	42,43	M-HC 1 AUF	MIXER HEAT CIRC. 1 OPEN
1	44,45	M-HC 1 ZU	MIXER HEAT CIRC. 1 CLOSE
1	46,47	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
1	48,49	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 10: HCW 008 Sol^k (HCW 1620 Expansion Module)

* Burner modulation via 0-10 V output at terminals 28 is possible on request.



Controller	Terminals	Abbreviation	Description
2	6,7	-	-
2	8,9	-	-
2	10,11	S-CIRC <2/10>	circulation <2/10>
2	12,13	-	-
2	14,15	-	-
2	16,17	-	-
2	18,19	-	-
2	20,21	-	-
2	22,23	S-FL-HC 3 <2/22>	flow heat circ. 3 <2/22>
2	24,25	S-FL-HC 4 <2/24>	flow heat circ. 4 <2/24>
2	26,27	-	-
2	28,29	-	-
2	30,31	-	-
2	32,33	-	-
2	34,35	-	-
2	36,37	P-HC 3 <2/36>	pump heat circ. 3 <2/36>
2	38,39	P-HC 4 <2/38>	pump heat circ. 4 <2/38>
2	40,41	P-CIRC <2/40>	pump circ. <2/40>
2	42,43	M-HC 3 AUF	MIXER HEAT CIRC. 3 OPEN
2	44,45	M-HC 3 ZU	MIXER HEAT CIRC. 3 CLOSE
2	46,47	M-HC 4 AUF	MIXER HEAT CIRC. 4 OPEN
2	48,49	M-HC 4 ZU	MIXER HEAT CIRC. 4 CLOSE

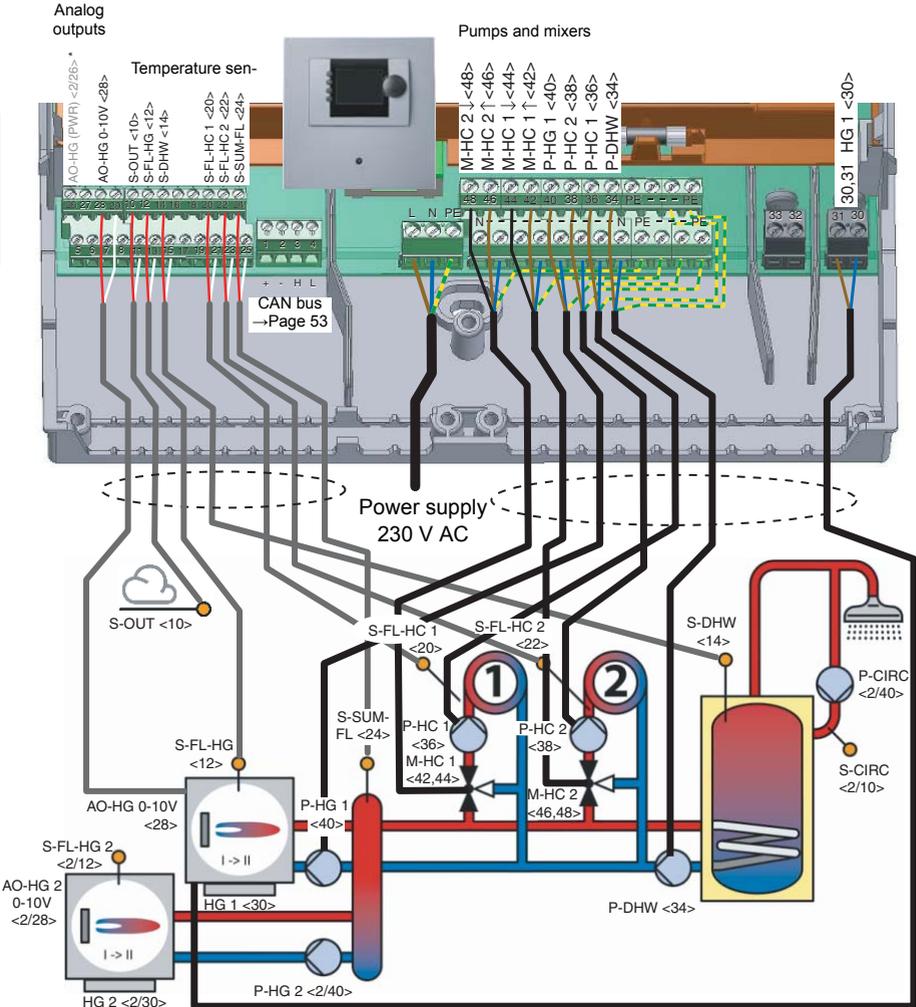
“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 11: HCW 011 KAS: (HCW 1620 Base Unit)

2 heat generators, heat exchangers, 4 heating circuits with mixer, 1 domestic hot water tank, domestic hot water circulation

Required sensors (PT 1000): 1 outdoor temperature sensor, 2 solar and boiler temperature sensors, 2 storage tank and buffer temperature sensors, 5 flow/return contact temperature sensors

* Bumer modulation via 0-10 V output at terminals 28 is possible on request.

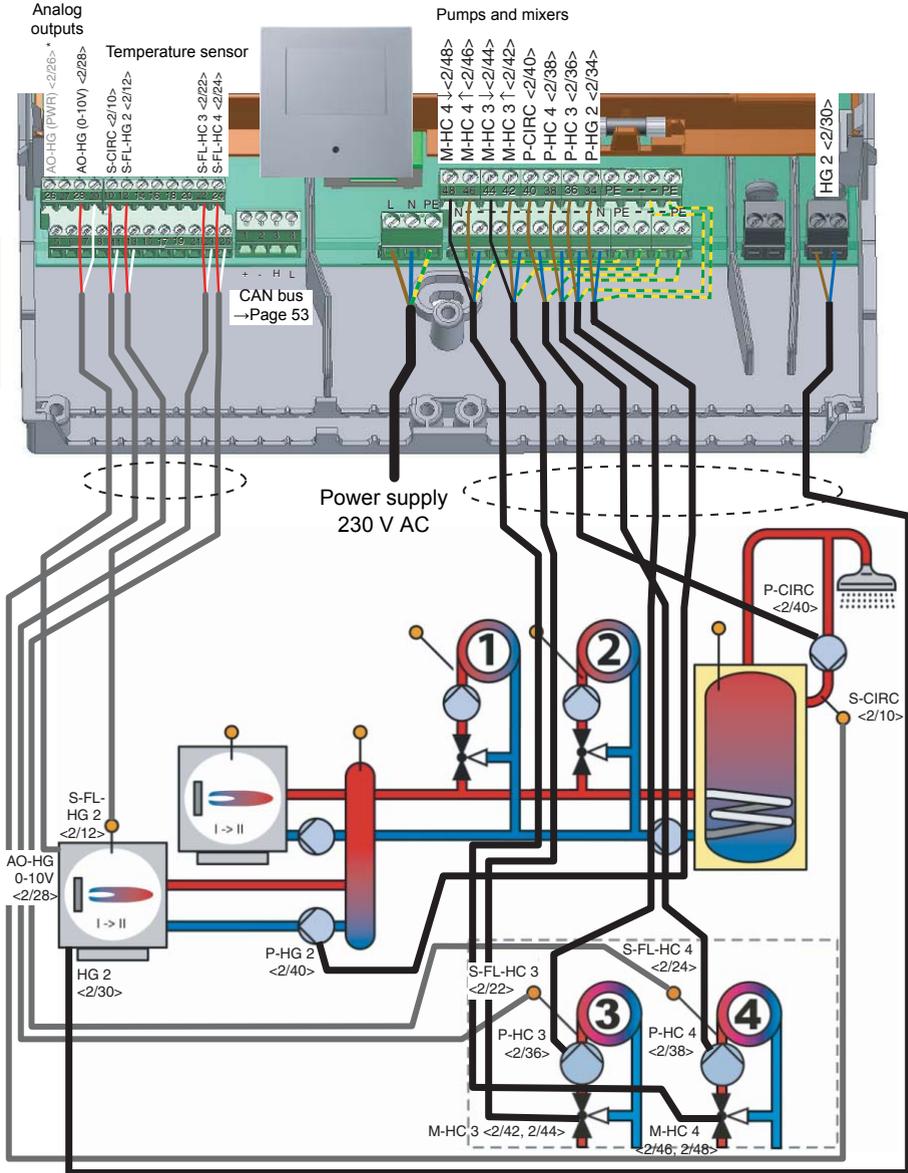


Controller	Terminals	Abbreviation	Description
1	6,7	-	-
1	8,9	-	-
1	10,11	S-OUT <1/10>	outdoor temp. <1/10>
1	12,13	S-FL-HG 1 <1/12>	flow heat gen. 1 <1/12>
1	14,15	S-DHW <1/14>	domest. hot water <1/14>
1	16,17	-	-
1	18,19	-	-
1	20,21	S-FL-HC 1 <1/20>	flow heat circ. 1 <1/20>
1	22,23	S-FL-HC 2 <1/22>	flow heat circ. 2 <1/22>
1	24,25	S-SUM-FL <1/24>	S-SUM-FL <1/24>
1	26,27	-	-
1	28,29	AO-HG 0-10V <1/28>	Signal HG 0-10V <1/28>
1	30,31	HG 1 <1/30>	Heat Generator 1 <1/30>
1	32,33	-	-
1	34,35	P-DHW <1/34>	pump dhw <1/34>
1	36,37	P-HC 1 <1/36>	pump heat circ. 1 <1/36>
1	38,39	P-HC 2 <1/38>	pump heat circ. 2 <1/38>
1	40,41	P-HG 1 <1/40>	pump heat gen. 1 <1/40>
1	42,43	M-HC 1 AUF	MIXER HEAT CIRC. 1 OPEN
1	44,45	M-HC 1 ZU	MIXER HEAT CIRC. 1 CLOSE
1	46,47	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
1	48,49	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 11: HCW 011 KAS (HCW 1620 Expansion Module)

* Burner modulation via 0-10 V output at terminals 28 is possible on request.



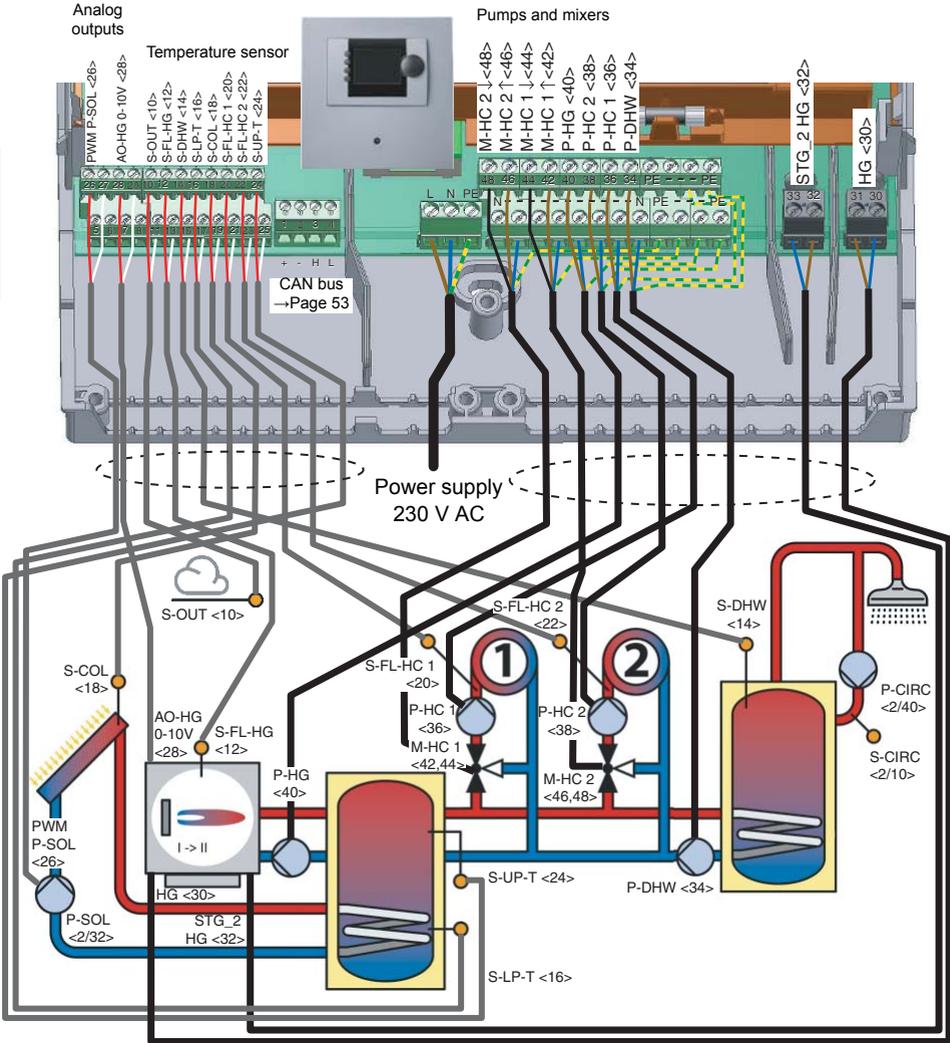
Controller	Terminals	Abbreviation	Description
2	6,7	-	-
2	8,9	-	-
2	10,11	S-CIRC <2/10>	circulation <2/10>
2	12,13	S-FL-HG 2 <2/12>	flow heat gen. 2 <2/12>
2	14,15	-	-
2	16,17	-	-
2	18,19	-	-
2	20,21	-	-
2	22,23	S-FL-HC 3 <2/22>	flow heat circ. 3 <2/22>
2	24,25	S-FL-HC 4 <2/24>	flow heat circ. 4 <2/24>
2	26,27	-	-
2	28,29	AO-HG 0-10V <2/28>	Signal HG 0-10V <2/28>
2	30,31	HG 2 <2/30>	Heat Generator 2 <2/30>
2	32,33	-	-
2	34,35	P-HG 2 <2/34>	pump heat gen. 2 <2/34>
2	36,37	P-HC 3 <2/36>	pump heat circ. 3 <2/36>
2	38,39	P-HC 4 <2/38>	pump heat circ. 4 <2/38>
2	40,41	P-CIRC <2/40>	pump circ. <2/40>
2	42,43	M-HC 3 AUF	MIXER HEAT CIRC. 3 OPEN
2	44,45	M-HC 3 ZU	MIXER HEAT CIRC. 3 CLOSE
2	46,47	M-HC 4 AUF	MIXER HEAT CIRC. 4 OPEN
2	48,49	M-HC 4 ZU	MIXER HEAT CIRC. 4 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 12: ›HCW 012 Sol‹ (HCW 1620 Base Unit)

1 two-stage heat generator, 4 heating circuits with mixer, 1 solar collector, 1 buffer tank, 1 domestic hot water tank, domestic hot water circulation

Required sensors (PT 1000): 1 outdoor temperature sensor, 2 solar and boiler temperature sensors, 3 storage tank and buffer temperature sensors, 5 flow/return contact temperature sensors

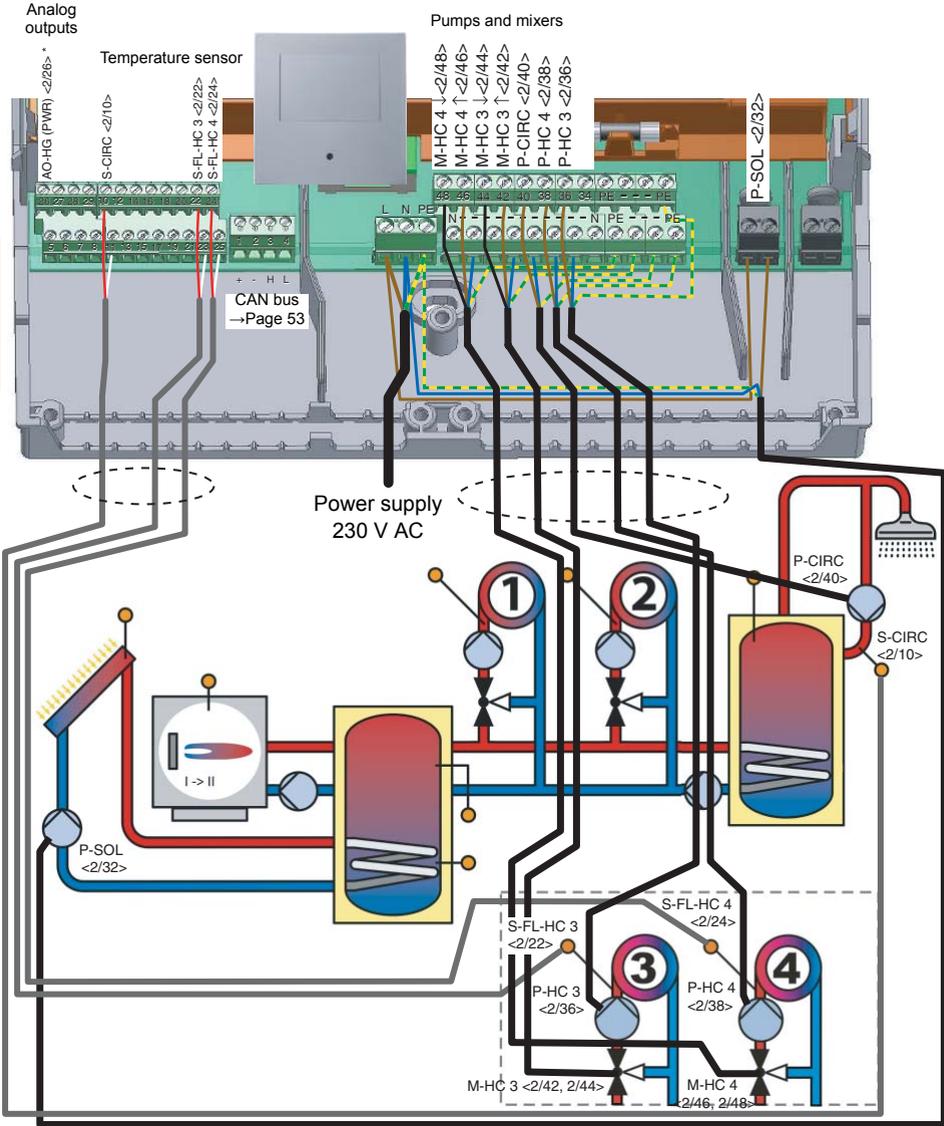


Controller	Terminals	Abbreviation	Description
1	6,7	-	-
1	8,9	-	-
1	10,11	S-OUT <1/10>	outdoor temp. <1/10>
1	12,13	S-FL-HG <1/12>	flow heat gen. <1/12>
1	14,15	S-DHW <1/14>	domest. hot water <1/14>
1	16,17	S-LP-T <1/16>	low er tank <1/16>
1	18,19	S-COL <1/18>	collector temp. <1/18>
1	20,21	S-FL-HC 1 <1/20>	flow heat circ. 1 <1/20>
1	22,23	S-FL-HC 2 <1/22>	flow heat circ. 2 <1/22>
1	24,25	S-UP-T <1/24>	upper tank <1/24>
1	26,27	PWMP-SOL <1/26>	PWM pump solar <1/26>
1	28,29	AO-HG 0-10V <1/28>	Signal HG 0-10V <1/28>
1	30,31	HG <1/30>	Heat Generator <1/30>
1	32,33	STG_2 HG <1/32>	Stage_2 HG <1/32>
1	34,35	P-DHW <1/34>	pump dhw <1/34>
1	36,37	P-HC 1 <1/36>	pump heat circ. 1 <1/36>
1	38,39	P-HC 2 <1/38>	pump heat circ. 2 <1/38>
1	40,41	P-HG <1/40>	pump heat gen. <1/40>
1	42,43	M-HC 1 AUF	MIXER HEAT CIRC. 1 OPEN
1	44,45	M-HC 1 ZU	MIXER HEAT CIRC. 1 CLOSE
1	46,47	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
1	48,49	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 12: ›HCW 012 Sol‹ (HCW 1620 Expansion Module)

* Burner modulation via 0-10 V output at terminals 28 is possible on request.



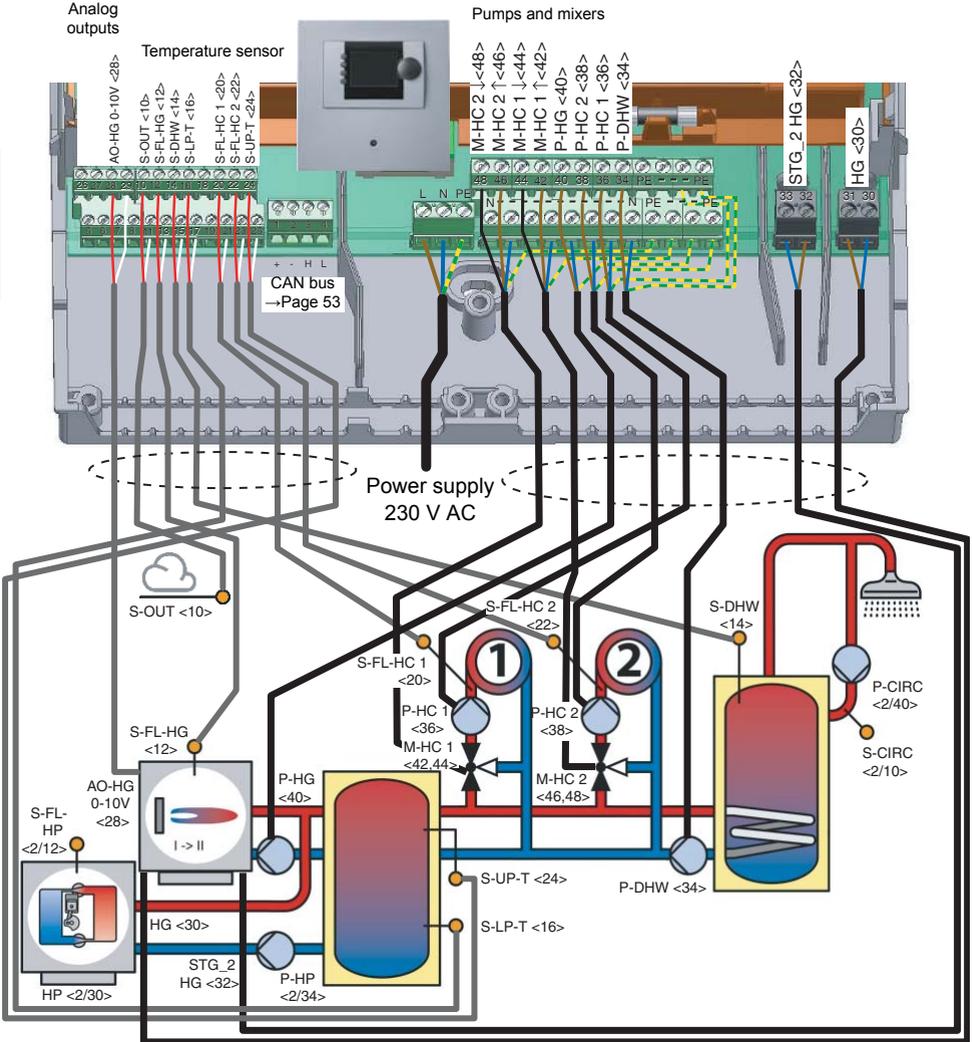
Controller	Terminals	Abbreviation	Description
2	6,7	-	-
2	8,9	-	-
2	10,11	S-CIRC <2/10>	circulation <2/10>
2	12,13	-	-
2	14,15	-	-
2	16,17	-	-
2	18,19	-	-
2	20,21	-	-
2	22,23	S-FL-HC 3 <2/22>	flow heat circ. 3 <2/22>
2	24,25	S-FL-HC 4 <2/24>	flow heat circ. 4 <2/24>
2	26,27	-	-
2	28,29	-	-
2	30,31	-	-
2	32,33	-	-
2	34,35	P-SOL <2/34>	pump solar <2/34>
2	36,37	P-HC 3 <2/36>	pump heat circ. 3 <2/36>
2	38,39	P-HC 4 <2/38>	pump heat circ. 4 <2/38>
2	40,41	P-CIRC <2/40>	pump circ. <2/40>
2	42,43	M-HC 3 AUF	MIXER HEAT CIRC. 3 OPEN
2	44,45	M-HC 3 ZU	MIXER HEAT CIRC. 3 CLOSE
2	46,47	M-HC 4 AUF	MIXER HEAT CIRC. 4 OPEN
2	48,49	M-HC 4 ZU	MIXER HEAT CIRC. 4 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 13: »HCW 013 HP« (HCW 1620 Base Unit)

1 two-stage heat generator, 1 heat pump, 4 heating circuits with mixer, 1 buffer tank, 1 domestic hot water tank, domestic hot water circulation

Required sensors (PT 1000): 1 outdoor temperature sensor, 2 solar and boiler temperature sensors, 3 storage tank and buffer temperature sensors, 5 flow/return contact temperature sensors

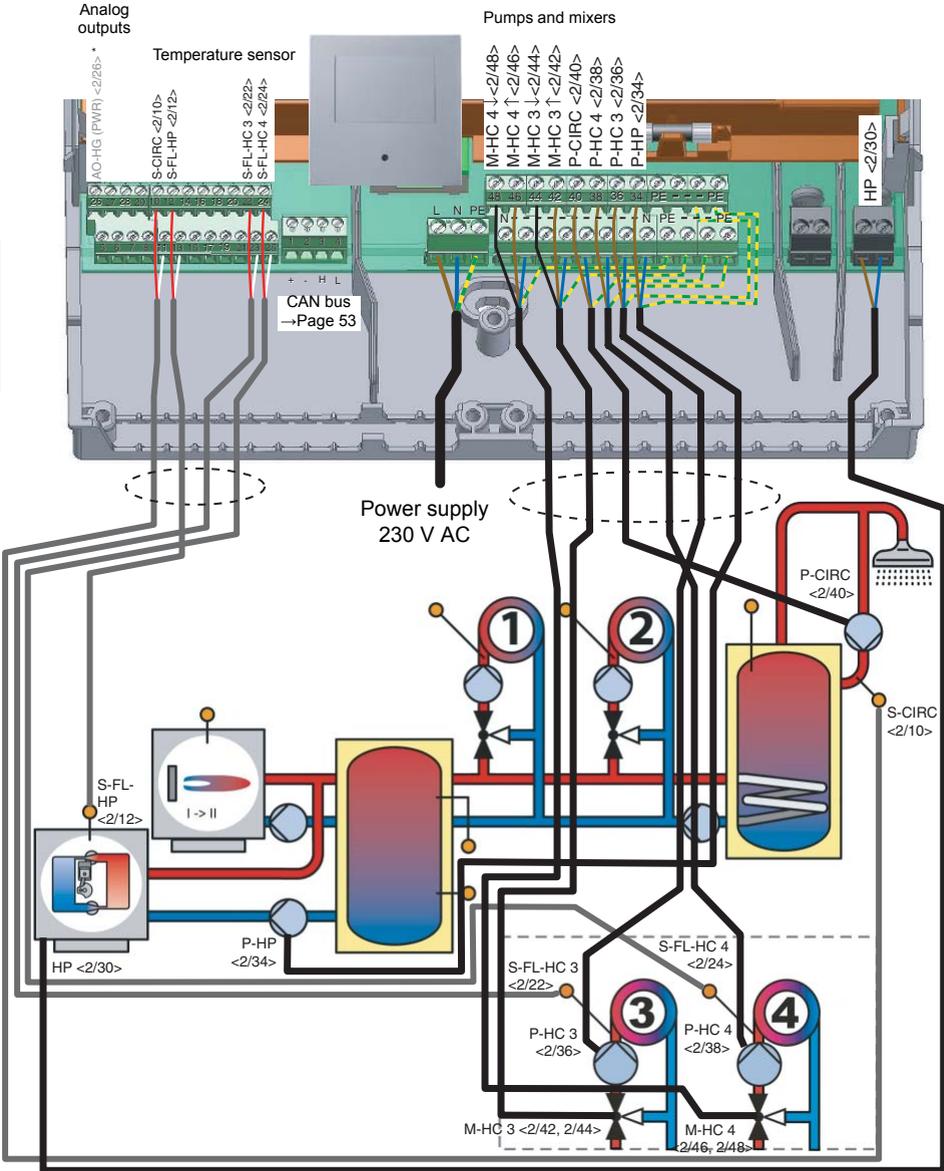


Controller	Terminals	Abbreviation	Description
1	6,7	-	-
1	8,9	-	-
1	10,11	S-OUT <1/10>	outdoor temp. <1/10>
1	12,13	S-FL-HG <1/12>	flow heat gen. <1/12>
1	14,15	S-DHW <1/14>	domest. hot water <1/14>
1	16,17	S-LP-T <1/16>	low er tank <1/16>
1	18,19	-	-
1	20,21	S-FL-HC 1 <1/20>	flow heat circ. 1 <1/20>
1	22,23	S-FL-HC 2 <1/22>	flow heat circ. 2 <1/22>
1	24,25	S-UP-T <1/24>	upper tank <1/24>
1	26,27	-	-
1	28,29	AO-HG 0-10V <1/28>	Signal HG 0-10V <1/28>
1	30,31	HG <1/30>	Heat Generator <1/30>
1	32,33	STG_2 HG <1/32>	Stage_2 HG <1/32>
1	34,35	P-DHW <1/34>	pump dhw <1/34>
1	36,37	P-HC 1 <1/36>	pump heat circ. 1 <1/36>
1	38,39	P-HC 2 <1/38>	pump heat circ. 2 <1/38>
1	40,41	P-HG <1/40>	pump heat gen. <1/40>
1	42,43	M-HC 1 AUF	MIXER HEAT CIRC. 1 OPEN
1	44,45	M-HC 1 ZU	MIXER HEAT CIRC. 1 CLOSE
1	46,47	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
1	48,49	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 13: ›HCW 013 HP‹ (HCW 1620 Expansion Module)

* Burner modulation via 0-10 V output at terminals 28 is possible on request.



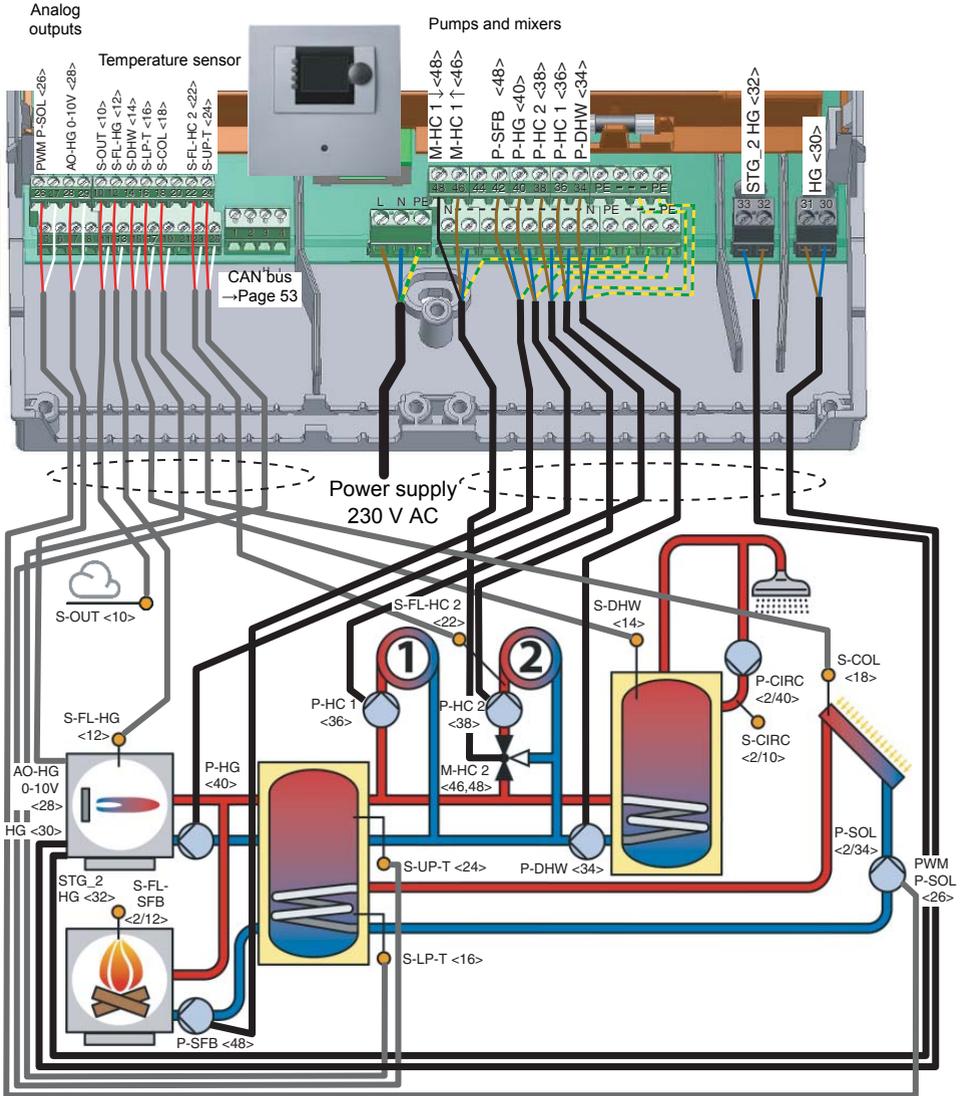
Controller	Terminals	Abbreviation	Description
2	6,7	-	-
2	8,9	-	-
2	10,11	S-CIRC <2/10>	circulation <2/10>
2	12,13	S-FL-HP <2/12>	flow heat pump <2/12>
2	14,15	-	-
2	16,17	-	-
2	18,19	-	-
2	20,21	-	-
2	22,23	S-FL-HC 3 <2/22>	flow heat circ. 3 <2/22>
2	24,25	S-FL-HC 4 <2/24>	flow heat circ. 4 <2/24>
2	26,27	-	-
2	28,29	-	-
2	30,31	HP <2/30>	heat pump <2/30>
2	32,33	-	-
2	34,35	P-HP 2 <2/34>	pump heat pump 2 <2/34>
2	36,37	P-HC 3 <2/36>	pump heat circ. 3 <2/36>
2	38,39	P-HC 4 <2/38>	pump heat circ. 4 <2/38>
2	40,41	P-CIRC <2/40>	pump circ. <2/40>
2	42,43	M-HC 3 AUF	MIXER HEAT CIRC. 3 OPEN
2	44,45	M-HC 3 ZU	MIXER HEAT CIRC. 3 CLOSE
2	46,47	M-HC 4 AUF	MIXER HEAT CIRC. 4 OPEN
2	48,49	M-HC 4 ZU	MIXER HEAT CIRC. 4 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 14: ›HCW 014 Sol-SF‹ (HCW 1620 Base Unit)

1 two-stage heat generator, 1 solid fuel boiler, 4 heating circuits with mixer, 1 solar collector, 1 buffer tank, 1 domestic hot water tank, domestic hot water circulation

Required sensors (PT 1000): 1 outdoor temperature sensor, 3 solar and boiler temperature sensors, 2 storage tank and buffer temperature sensors, 5 flow/return contact temperature sensors

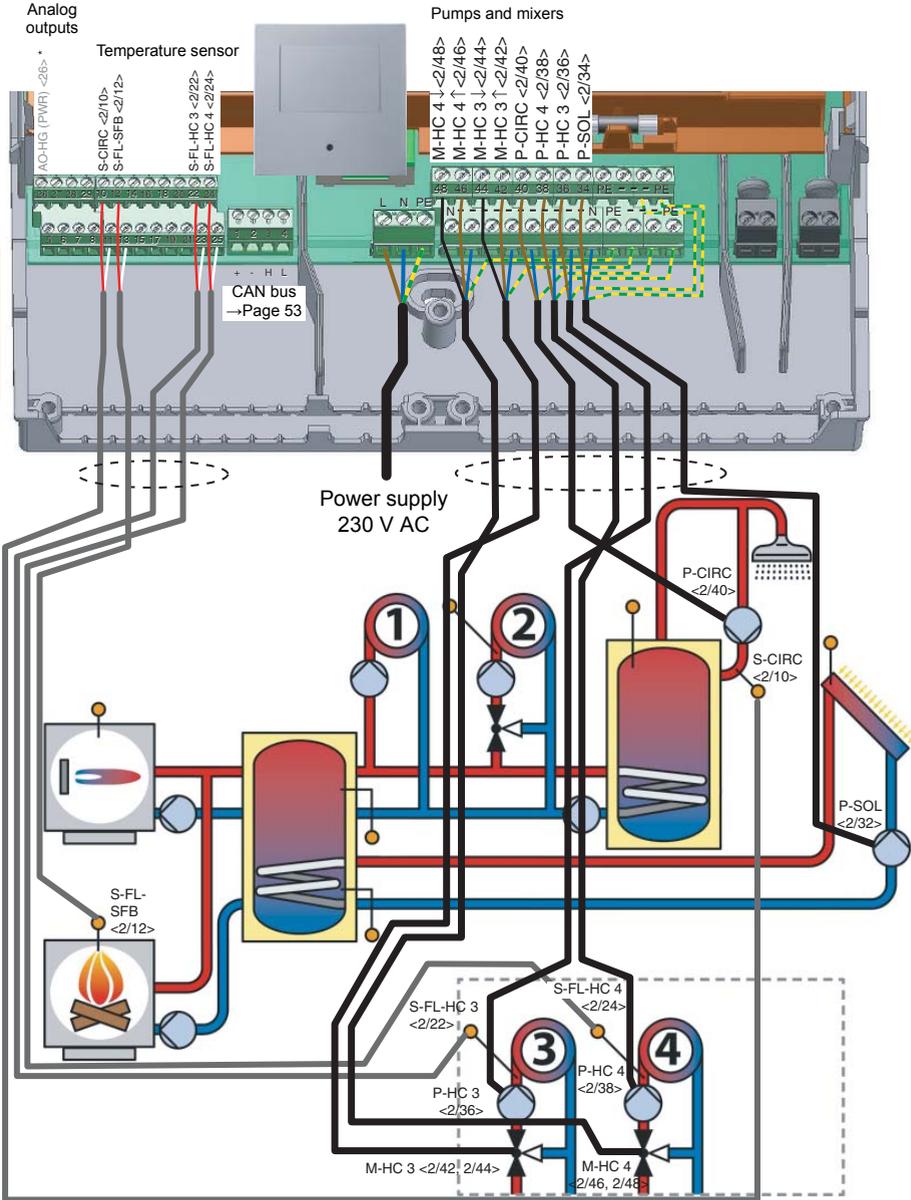


Controller	Terminals	Abbreviation	Description
1	6,7	-	-
1	8,9	-	-
1	10,11	S-OUT <1/10>	outdoor temp. <1/10>
1	12,13	S-FL-HG <1/12>	flow heat gen. <1/12>
1	14,15	S-DHW <1/14>	domest. hot water <1/14>
1	16,17	S-LP-T <1/16>	low er tank <1/16>
1	18,19	S-COL <1/18>	collector temp. <1/18>
1	20,21	-	-
1	22,23	S-FL-HC 2 <1/22>	flow heat circ. 2 <1/22>
1	24,25	S-UP-T <1/24>	upper tank <1/24>
1	26,27	PWMP-SOL <1/26>	PWM pump solar <1/26>
1	28,29	AO-HG 0-10V <1/28>	Signal HG 0-10V <1/28>
1	30,31	HG <1/30>	Heat Generator <1/30>
1	32,33	STG_2 HG <1/32>	Stage_2 HG <1/32>
1	34,35	P-DHW <1/34>	pump dhw <1/34>
1	36,37	P-HC 1 <1/36>	pump heat circ. 1 <1/36>
1	38,39	P-HC 2 <1/38>	pump heat circ. 2 <1/38>
1	40,41	P-HG <1/40>	pump heat gen. <1/40>
1	42,43	P-SFB <1/42>	pump solid fuel <1/42>
1	44,45	-	-
1	46,47	M-HC 2 AUF	MIXER HEAT CIRC. 2 OPEN
1	48,49	M-HC 2 ZU	MIXER HEAT CIRC. 2 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Hydraulic system 14: »HCW 014 Sol-SF« (HCW 1620 Expansion Module)

* Burner modulation via 0-10 V output at terminals 28 is possible on request.



Controller	Terminals	Abbreviation	Description
2	6,7	-	-
2	8,9	-	-
2	10,11	S-CIRC <2/10>	circulation <2/10>
2	12,13	S-FL-SFB <2/12>	flow sol fuel gen. <2/12>
2	14,15	-	-
2	16,17	-	-
2	18,19	-	-
2	20,21	-	-
2	22,23	S-FL-HC 3 <2/22>	flow heat circ. 3 <2/22>
2	24,25	S-FL-HC 4 <2/24>	flow heat circ. 4 <2/24>
2	26,27	-	-
2	28,29	-	-
2	30,31	-	-
2	32,33	-	-
2	34,35	P-SOL <2/34>	pump solar <2/34>
2	36,37	P-HC 3 <2/36>	pump heat circ. 3 <2/36>
2	38,39	P-HC 4 <2/38>	pump heat circ. 4 <2/38>
2	40,41	P-CIRC <2/40>	pump circ. <2/40>
2	42,43	M-HC 3 AUF	MIXER HEAT CIRC. 3 OPEN
2	44,45	M-HC 3 ZU	MIXER HEAT CIRC. 3 CLOSE
2	46,47	M-HC 4 AUF	MIXER HEAT CIRC. 4 OPEN
2	48,49	M-HC 4 ZU	MIXER HEAT CIRC. 4 CLOSE

“Abbreviations for hydraulic components, inputs and outputs” on page 100

Abbreviations for hydraulic components, inputs and outputs

Abbreviation		Description
HG		Heat generator
STG_2		Stage 2 Heat generator
HP		Heat pump
SFB		Solid fuel boilers
S.		Temperature sensor
	HC	Heating circuit
	FL	Flow line
	RL	Return line
	TOTAL	Total flow
	LP	Tank low level
	MP	Tank middle level
	UP	Tank upper level
	HW	Hot water
	OUT	Outside temperature
	CIRC	Hot water circulation
	COL	Solar collector panel
P-		Pump
	HC	Heating circuit
	HW	Hot water
	SFB	Solid fuel boilers
	CIRC	Hot water circulation
	SOL	Solar
M-		Mixer
	↑	Mixer OPEN
	↓	Mixer CLOSED
AO-		Analog output
	(PWR)	Power control (possible on request)
PWM		Pulse-width modulation
N/C		Not connected

Function description

NOTE	The functions listed below are not implemented in all systems.
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Solar operation

The solar pump is switched on when the collector temperature is higher than the storage tank temperature by the adjustable switch-on temperature difference and when the collector temperature has reached the minimum temperature.

The solar pump is switched off when the maximum temperature or minimum temperature of the collector is reached or when the collector temperature plus half the switch-on temperature difference is lower than the storage tank temperature, or when the maximum temperature of the storage tank is reached.

During solar storage tank charging, the speed of the pump is controlled via the PWM signal in order to achieve the maximum possible solar yield. In differential value control, a specified temperature difference between the collector sensor and the storage tank sensor must be maintained.

In order to guarantee a minimum flow rate in the solar system, a minimum speed is specified for the solar pump.

Collector cooling

As a rule, the solar system switches off when the set maximum storage tank temperature is reached. However, if the collector temperature rises to the set maximum collector temperature, the solar pump runs at its start speed until the temperature falls below this limit again. The storage tank temperature can increase further up to the storage tank safety temperature (90°C).

Storage recooling

If the storage tank temperature is above the maximum storage tank temperature and the current collector temperature is at least 5 K below the storage tank temperature due to the collector cooling, the solar pump runs at its start speed until the storage tank has cooled down to the set maximum storage tank temperature via the collector and the pipes.

Limit temperature

If the collector temperature exceeds the maximum collector temperature, the solar system is deactivated until the maximum collector temperature is again below by 5K.

Solar pump anti-lock circuit (ABS)

During the low yield season, usually September to May, the anti-lock circuit for the solar pump is released. This happens once a week within a short time window of 1 minute (factory setting). This time can be changed by the installer or the ABS function can be completely deactivated.

Buffer management function

In systems with a central buffer system, individual heat generators are released/locked via a special buffer management system, which gives preference to heat generators that use renewable energies. The intelligent buffer management monitors the temperature development in the buffer system and the stand-by state of the heat generators. Only if the heat generator(s) using regenerative ener-

gies are not able to cover the current heat demand are conventional heat generators released. The temperature of the conventional heat generator and the buffer temperature are permanently aligned, even at standstill. If the temperature of the heat generator is below the buffer temperature, its pump is locked and only released when the buffer temperature is below the temperature of the heat generator.

Note: This has no effect on any minimum temperature of the conventional heat generator.

Heat generator

This uses the principle of flexible operation according to outdoor temperature. When the calculated temperature set point is reached, always starting from the heating circuit with the highest temperature demand, the switching contact is opened. In order to minimize a heat generator cycle, a delay time for restarting can be programmed.

A PT1000 sensor must be installed on the boiler to monitor/control the boiler temperature.

Modulating heat generators (optional)

An analog output gives the calculated temperature setpoint for the heat generator in the form of a 0-10 V signal. This signal can also be used to control modulating boilers if an appropriate input is available. An OpenTherm interface (0-10V on OT) can also be used as an accessory.

Operation of two heat generators

The second heat generator is switched on depending on the switch-on integral.

Switch-on integral = $\Delta T \times \text{time} > K \text{ min}$

The higher the temperature difference, the faster the boiler is switched on.

This allows the heat generator to be switched on quickly in the event of large temperature differences and also avoids frequent switching cycles.

Air-source heat pump and peak load boiler

In conjunction with a conventional boiler, the heat pump always takes precedence, as it operates considerably more economically. With air-source heat pumps, however, this advantage decreases as the outside temperature decreases, and more and more electrical energy is required to generate heat. As soon as the outside temperature drops below -8°C , the conventional heat generator is requested by preference. The aim is to achieve an optimized interaction between an air-source heat pump and a peak load boiler depending on the current outdoor temperature.

The temperature threshold value can be adjusted individually (down to -50°C) on the respective heat pump by the factory service department. If a brine heat pump is used, this function must always be adjusted by the factory service department.

Wood-fired boiler and conventional heat generator

In addition to buffer management, an immediate heat generator lock is also programmed. As soon as buffer charging by the solid fuel boiler is active, the conventional heat generator is shut down. In this way, the largest possible buffer capacity is made available to the solid fuel boiler.

This function can be switched off by the factory service department if required. This is not a substitute for the installation of prescribed safety devices or safety functions which must be provided by the control logic of the solid fuel boiler.

Timer program

The timer program is active in automatic mode.

Three time blocks with different temperatures are possible in the time program.

Without a room controller, the flow temperature is controlled so that the calculated room temperature can be reached.

The room temperature is controlled by a room controller:

- Within a time block, the room temperature in the reference room is set to the set target temperature plus the temperature difference set on the room controller (-3...+3 K).
- If a temperature difference is set on the room controller, the time program continues to run.
- If an end position (+) or (-) is set on the room controller, the time program is deactivated. In the end position (+), the room temperature is set to the highest temperature of the day. In the end position (-), it is set to the setback temperature.

Tip: Setting a higher temperature in an unused time range controls the higher temperature when (+) is set on the room controller.

Global day/night temperature

Room set points can be set for each heating circuit and time block. With the "global day temperature", the same temperature is used for all heating circuits and time blocks.

In setback mode, the temperatures can be set per room/mixer circuit. With the "global night temperature", the same temperature is used for all heating circuits and time blocks.

Frost protection

The frost protection is active

- if the outdoor temperature is below an adjustable limit value,
- or if the room temperature is below an adjustable limit value (with room controller),
- or if the flow temperature is below an adjustable limit value.

Summer operation

Summer operation can be set via the operating mode:

- Summer mode: The heating does not switch on (except frost protection functions).
- Automatic operating mode: The heating switches on when the outdoor temperature is below the outdoor temperature limit (for weather-compensated heating circuits) or the measured room temperature is below the room temperature set point (for room temperature-controlled heating circuits).

Domestic hot water temperature

The domestic hot water temperature is controlled by nominal and real value.

- The nominal value is the set value, e.g. 50°C.
- The real value is a calculated value. This can deviate from the nominal value if the controller reacts to other influences or settings and then takes the calculated value as the setpoint, e.g. reduced domestic hot water temperature outside the domestic hot water time block 40°C



Outside the time blocks, the domestic hot water is heated only at a reduced temperature.

Example:

Set temperature 50°C, hysteresis 10K → temperature between 40°C and 50°C

In setback mode, the temperature is reduced by the hysteresis

→ Temperature between 30°C and 40°C.

Domestic hot water priority

When domestic hot water priority is activated, all pumps that supply the heating circuits are switched off during domestic hot water operation or storage tank charging.

Outdoor temperature-controlled setting

In principle, the heating circuits are set to the flow temperature depending on the current outdoor temperature.

Unmixed heating circuits cannot themselves be individually controlled, as all are necessarily supplied with the same flow temperature. The controlled variable (actual value) is usually the boiler temperature, but system temperature (total flow) or buffer temperature is also possible depending on the design of the heating system.

Control loops with mixers

If several heating circuits are present in a system and they are to be supplied with different flow temperatures, this is done by using mixers (usually 3-way mixers) and one sensor each for recording the current flow temperature.

Mixers allow much more precise temperature control than e.g. valves or the permanent switching on and off of the pumps.

The flow temperature required depending on the outdoor temperature is calculated using the heating curve. An individual heating curve can be defined for each heating circuit.

Heating curve

The heating curves used for this controller have the special feature that their course can be set progressively. This is made possible by the fact that the heating curve is determined differently than usual - not only by two, but by four points.

The four reference points of the outdoor temperature (P1...P4) apply globally, i.e. for all heating curves.

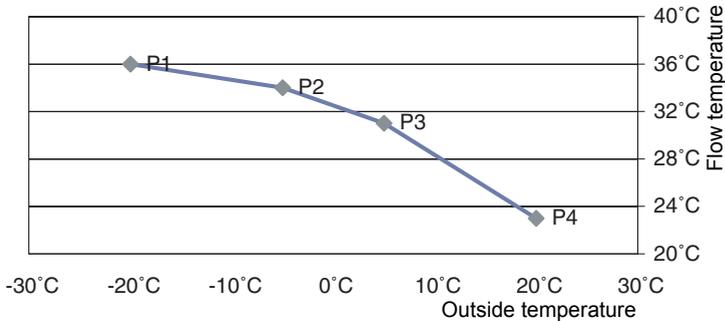
Set in the menu ›INSTALLER‹ - ›COMMISSIONING‹ - ›BASE OT HEAT CURVE‹, see "Change heating curve" on page 113

The flow temperature set point belonging to each reference point can be set individually for each heating curve. This is determined for the first time by the specialist installer during commissioning and depends on the insulation value of the building and the user's wishes for comfort and warmth.

Set in menu ›HEAT CIRCUITS‹ - ›HEAT CIRCUIT X‹ - ›HEAT CURVE‹ or ›MIXER HEAT CIRC. X‹, see "›HEAT CIRCUITS‹ menu (Installer)" on page 130

The settings in the ›HEAT CURVE‹ menu are adapted to the heating circuits for radiators, in the ›MIXER HEAT CIRC. X‹ menu to heating circuits for underfloor heating.

Example of a low temperature heating circuit:



The possibility of specifying four points for the heating curve allows you to select different 'bends' of the heating curve for different outdoor temperature ranges and to optimally adapt your system to the respective conditions (building insulation, etc.).

Note: Points P1 to P4 must follow each other in order and give a repetitively falling heating curve. This means that P1 is at the lowest outdoor temperature, P2 at the next higher, P3 at the next, P4 at the highest outdoor temperature. The temperature values must differ by at least 1°C. The same applies vice versa for the flow temperatures, P1 starting with the highest value, then decreasing. Two flow temperatures can be the same.

Using the smart Econ room controller

The flow temperature can be controlled with one or more room controllers depending on the room temperature. However, operation without a room controller is also possible.

The control function of the room controllers can be configured as follows:

Outdoor temperature-guided control without remote setting

No room controller is installed in this variant.

The heating circuit runs in the ›AUTOMATIC‹ operating mode as soon as the outdoor temperature drops below the preset limits. (Heating limit during the day e.g. 18°C, heating limit at night e.g. 3°C).

The outdoor temperature-controlled flow temperature is influenced by the room setpoint temperature. The reference temperature is 20 °C, higher or lower values increase or decrease the flow temperature.

Outdoor temperature-guided control with remote setting

The heating circuit runs in the ›AUTOMATIC‹ operating mode as soon as the moderated outdoor temperature drops below the preset limits. (Heating limit during the day e.g. 18°C, heating limit at night e.g. 3°C).

The outdoor temperature-controlled flow temperature is influenced by the room setpoint temperature. The reference temperature for the heating curve is 20 °C, higher or lower values increase or decrease the flow temperature.

A room controller is used to change the set room temperature in the control room.

In addition, the operating mode for the relevant heating circuit can be changed via the room controller. Position (+) is party mode, position (-) is setback mode.

Example:

The programmed room setpoint temperature is 21 °C.

The room controller is set to +2.

This results in a desired room temperature of 23 °C.

The deviation from the reference value 20°C is 3 K.

Deviation * Factor = Change in flow temperature compared to the pure outdoor temperature-controlled heating curve.

The factor is determined during commissioning.

For panel heating systems the factor is e.g. 2, for radiators e.g. 4.

In addition, the calculated shift is limited to a maximum value.



Outdoor temperature-guided control with room influence

The heating circuit runs in the ›AUTOMATIC‹ operating mode as soon as the outdoor temperature drops below the preset limits. (Heating limit during the day e.g. 18°C, heating limit at night e.g. 3°C).

The outdoor temperature-controlled flow temperature is influenced by the room temperature. Deviations of the room temperature from the setpoint temperature increase or decrease the flow temperature.

For setting see "›HEAT CIRCUITS‹ menu" on page 36

In contrast to individual room control, the heating circuit pump is not switched off when the room setpoint temperature is reached, but the flow temperature is reduced when the room setpoint temperature is exceeded.

The room controller is used to change the set room temperature.

In addition, the operating mode for the relevant heating circuit can be changed via the room controller. Position (+) is party mode, position (-) is setback mode.

Example:

The programmed room setpoint temperature is 21 °C.

The room controller is set to +2.

This results in a desired room temperature of 23 °C.

The measured room temperature is 22 °C, the deviation is 1 K.

Deviation * Factor = Change in flow temperature compared to the pure outdoor temperature-controlled heating curve.

The factor is determined during commissioning.

For panel heating systems the factor is e.g. 2, for radiators e.g. 4.

In addition, the calculated shift is limited to a maximum value.

Commissioning

NOTE	<p>Before startup, all components of the smart Econ heating system controller must be assembled and connected correctly and ready for operation.</p> <p>All required inputs and outputs have to be connected.</p>
-------------	---

These are example instructions on how to commission the smart Econ heating system controller. Details can vary depending on the hydraulic configuration and the software version.

- Check the electric connection.
Recommendation: Check the CAN bus cable with the continuity tester. To do so, open the bus connectors.
- Check the termination of the CAN bus line at both ends (jumper/switch).
- Connect all smart Econ system components to the power supply.
- Change the language of the Userinterface if necessary.
"Main menu for the installer" on page 108
- Set the date and time on the Userinterface if necessary.
"Set date and time" on page 42
- Enter the (previously noted) node numbers of all smart Econ room controllers .
"Node number room controller" on page 51
"Configuring the room controller ›CONFIG RC:‹" on page 123
- Select the hydraulic system.
"Hydraulic systems and connection diagrams" on page 56
"Select hydraulic system" on page 111
- Specify the operating mode.
"›OPERATING MODES‹ menu" on page 27
- Specify the heating times.
"›TIMER PROGRAMS‹ menu" on page 30
- Specify the temperature setpoints.
"›HEAT CIRCUITS‹ menu" on page 36
- If necessary, change further parameters and settings of the system configuration.
"Device configuration" on page 108



Device configuration

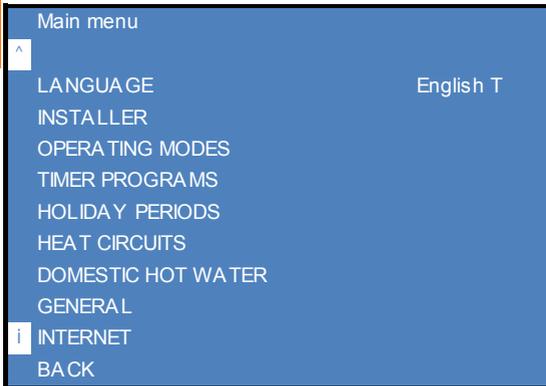
Enter access code for the installer

- Select ›MENU‹.
You have to enter the access code.
“Entering the access code” on page 23
- Enter the access code for the installer.(Default setting: 1234)
“Change values” on page 23
- Press the turn knob to confirm.

Additional menu items appear for the installer, these are described below.

For settings that are also available for the end user, see “Settings during operation” on page 23

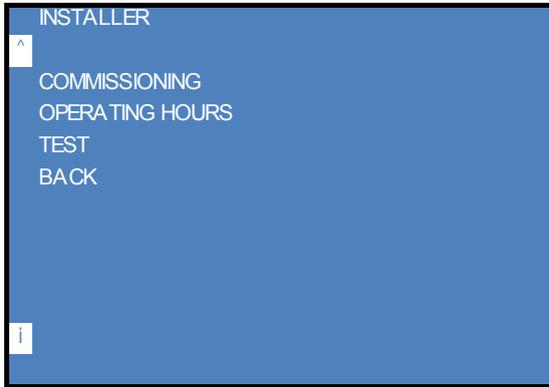
Main menu for the installer



- Changing the Language: ›LANGUAGE‹.
“Change values” on page 23
- “›INSTALLER‹ menu” on page 109
- “›OPERATING HOURS‹ Menu” on page 125
- “›HOLIDAY PERIODS‹ menu” on page 35
- “›HEAT CIRCUITS‹ menu (Installer)” on page 130
- “›DOMESTIC HOT WATER‹ menu (Installer)” on page 135
- “›GENERAL‹ menu (Installer)” on page 140

See also “Main menu” on page 26

›INSTALLER‹ menu

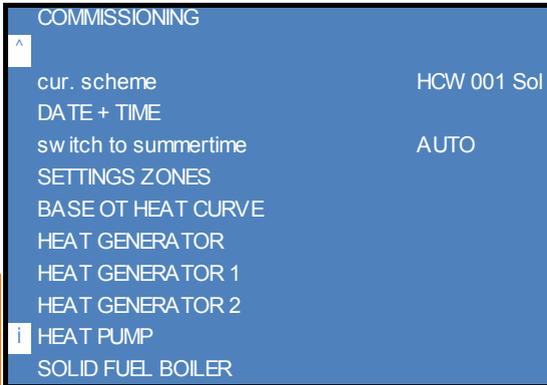


In the ›INSTALLER‹ menu you can define settings for commissioning, view the operating hours of the connected components and perform manual tests.

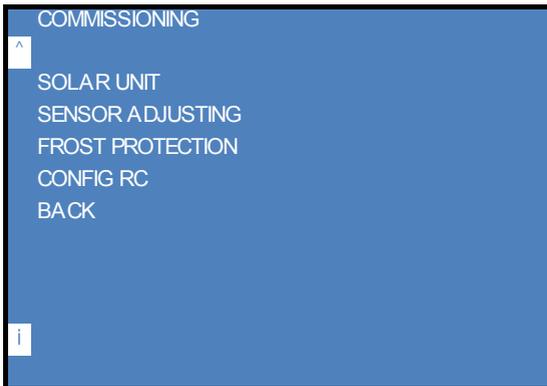
- “›COMMISSIONING‹ menu” on page 110
- “›OPERATING HOURS‹ Menu” on page 125
- “›TEST‹ Menu” on page 126



›COMMISSIONING‹ menu



(Menu page 1, example, depending on the selected system)



(Menu page 2, example, depending on the selected system)

In the ›COMMISSIONING‹ menu you define the configuration for the entire system.

Select hydraulic system



- At the start of commissioning, select the hydraulic system by pressing ›cur. scheme‹ in the ›COMMISSIONING‹ menu.
“Hydraulic systems and connection diagrams” on page 56

NOTE	After a change to the hydraulic diagram, the controller restarts and a bus setup is carried out. This can take 1 or 2 minutes.
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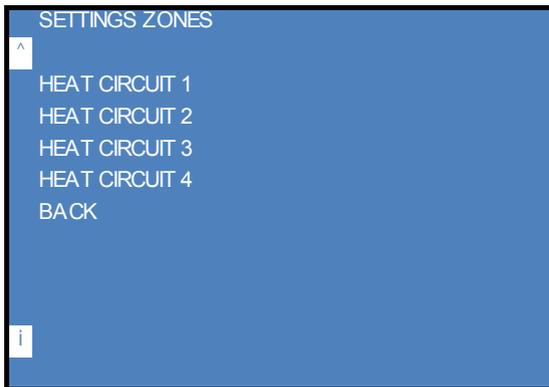
Setting the date, time and daylight saving time



- Set the current date and time using ›DATE + TIME‹ in the ›COMMISSIONING‹ menu.
See also “Set date and time” on page 42
- If necessary, change the settings for daylight saving time.

Configuring heating circuits/zones

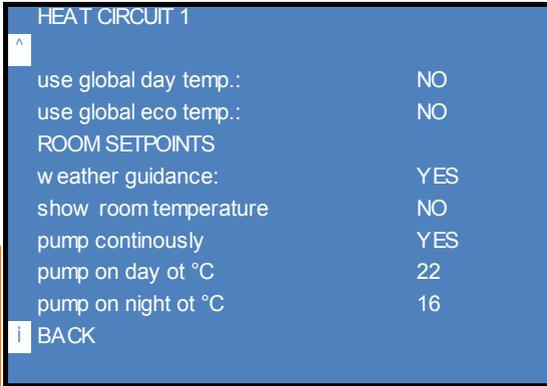
- Select ›SETTINGS ZONE‹ from the ›COMMISSIONING‹ menu.



(Example, depending on the selected system)



- Select a heating circuit, e.g. ›HEAT CIRCUIT 1‹ .
Make the settings for the other heating circuits accordingly.



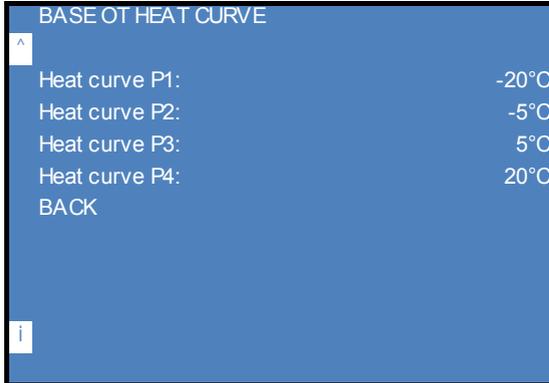
HEAT CIRCUIT 1	
use global day temp.:	NO
use global eco temp.:	NO
ROOM SETPOINTS	
weather guidance:	YES
show room temperature	NO
pump continuously	YES
pump on day of °C	22
pump on night of °C	16
BACK	

(Example, depending on the selected system)

- Change whether or not the global set points for this heating circuit are to be used, if necessary.
 - ›use global day temp.‹: Setpoint temperature for heating times
 - ›use global eco temp.‹: Setpoint temperature for setback times
 - ›weather guidance‹: After connecting a room controller, 100% room control can be set here.
 - ›show room temperature‹: Display room temperature in overview mode (without room controller)
 - ›pump continuously‹: Outdoor temperature-dependent pump operation
 - ›pump on day of °C‹: If the outdoor temperature in daytime operation is below the set temperature, the pump is switched on.
 - ›pump on night of °C‹: If the outdoor temperature in night mode is below the set temperature, the pump is switched on.“Change values” on page 23
- Select ›ROOM SETPOINTS‹.
 - Setting of switching times and room temperatures (local)“Setting heating periods and temperatures” on page 31

Change heating curve

- Select ›BASE OT HEAT CURVE‹ from the ›COMMISSIONING‹ menu.
Here you define the global outdoor temperature limits for the heating curve.



- Change the temperatures for the points in the heating curve if necessary.
“Heating curve” on page 104
“Change values” on page 23

Note: Points P1 to P4 must follow each other in order and give a repetitively falling heating curve. This means that P1 is at the lowest outdoor temperature, P2 at the next higher, P3 at the next, P4 at the highest outdoor temperature. The temperature values must differ by at least 1°C. The same applies vice versa for the flow temperatures, P1 starting with the highest value, then decreasing. Two flow temperatures can be the same.

Configure request for heat generator

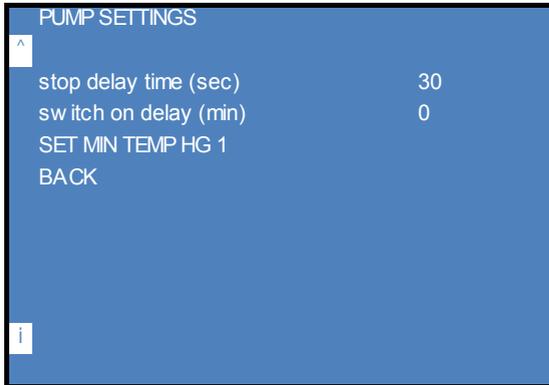
- Select ›HEAT GENERATOR ...‹ from the ›COMMISSIONING‹ menu.
Make the settings for the other heat generators accordingly.

HEAT GENERATOR	
▲	
NAME	Heat generator <30>
current set point (°C)	0
supply temp boiler load (°C)	65
minimum supply temp. (°C)	20
maximum supply temp. (°C)	80
hysteresis (K)	5
supply temp. above mixer (K)	3
switch on delay (min)	1
▶	PUMP SETTINGS
◀	BACK

(Example, depending on the selected system)

- Change the name of this heat generator if necessary.
 - Change other parameters if necessary.
 - ›supply temp boiler load (°C)‹: Minimum boiler setpoint temperature during storage tank charging (setting range 0-99 °C)
Note: Regardless of the setting made here, there is always a temperature increase of 10K to the charging temperature compared to the target domestic hot water temperature.
 - ›minimum supply temp. (°C)‹: Minimum boiler temperature for starting release of all connected pumps (boiler startup protector).
If this is not reached, all pumps in the connected heating circuits also stop. (setting range 0-99 °C)
 - ›maximum supply temp. (°C)‹: Maximum boiler temperature (setting range 0-99 °C)
 - ›hysteresis (K)‹: Boiler switching hysteresis
Boiler temperature at half set value below setpoint → boiler start, half value above setpoint → boiler stop. (adjustment range 0-99K)
Example: Hysteresis = 5K, setpoint = 60°C
Boiler temperature = 57.5°C → Boiler ON
Boiler temperature = 62.5°C → Boiler OFF
 - ›supply temp. above mixer (K)‹: Boost boiler temperature above set point of mixer circuit (adjustment range 0-20K).
 - ›switch on delay (min)‹: Minimum waiting time until a new burner start is enabled (setting range 0-65535 min)
- “Change values” on page 23

- Select ›PUMP SETTINGS‹.

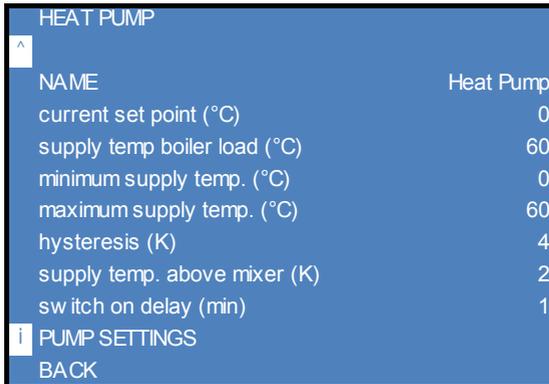


- Change the parameters if necessary.
 - ›stop delay time (sec)‹
 - ›switch on delay (min)‹
 - ›SET MIN TEMP HG 1‹ - ›limit value‹: Minimum temperature of the heat generator as buffer discharge protection
“Change values” on page 23

Configure heat pump

(Only for systems with heat pump)

- Select ›HEAT PUMP‹ from the ›COMMISSIONING‹ menu.



- Change the name of the heat pump if necessary.
- Change other parameters if necessary.
 - ›minimum supply temp. (°C)‹: The pump stops at temperatures below the set value (startup protection). Recommendation: <10°C
“Change values” on page 23

Configure solid fuel boiler

(Only for systems with solid fuel boiler)

- Select ›SOLID FUEL BOILER‹ in the ›COMMISSIONING‹ menu.

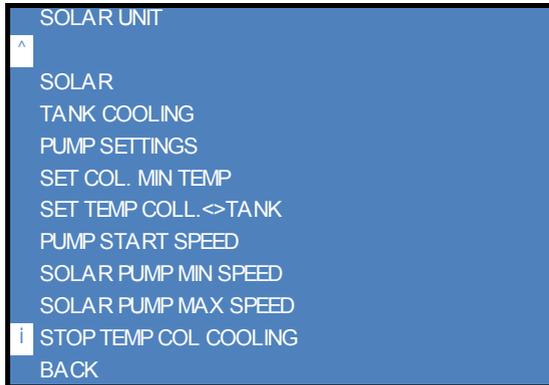
```
SOLID FUEL BOILER
^
NAME                               Solid Fuel Boiler
start-up temperature                55
hysteresis (K)                     5
PUMP SETTINGS
BACK
i
```

- Change the name of this solid fuel boiler if necessary.
 - Change other parameters if necessary.
 - ›start-up temperature‹: Minimum boiler flow temperature for release of charge pump (setting range 0-99 °C)
 - ›hysteresis (K)‹: Minimum temperature difference required between boiler and buffer to start the charge pump (start-up hysteresis)
Start of buffer charging, both conditions must be met:
 - 1.)The boiler temperature has reached the start-up temperature and
 - 2) the boiler temperature is higher by the hysteresis than the current temperature in the buffer.
- “Change values” on page 23

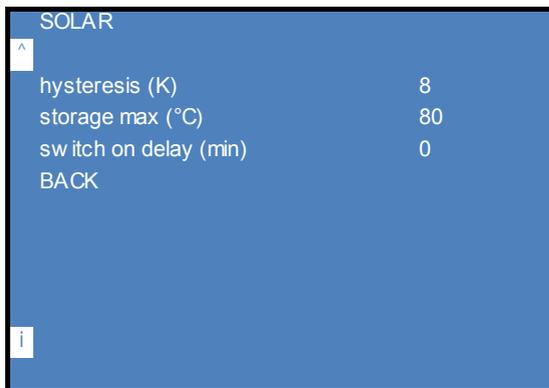
Configure solar system

(Only for systems with solar collector, depending on the selected system)

- Select ›SOLAR UNIT‹ in the ›COMMISSIONING‹ menu.



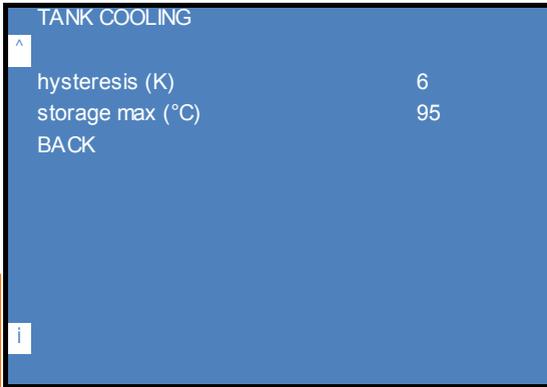
- Select ›SOLAR‹ in the ›SOLAR UNIT‹ menu.



- Change the parameters if necessary.
 - ›hysteresis (K)‹: Switch-on hysteresis solar pump
Boost of the current collector temperature above the current buffer temperature to start the solar pump
(Setting range: 0-99 K)
 - ›storage max °C‹: Maximum permissible buffer temperature when solar pump is exceeded = OFF
(Setting range: 0-99 K)
- “Change values” on page 23

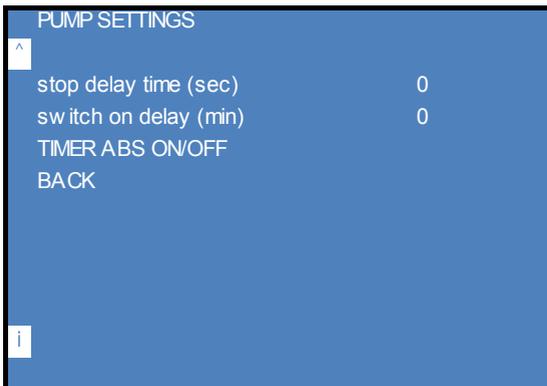


- Select ›TANK COOLING‹ in the ›SOLAR UNIT‹ menu.



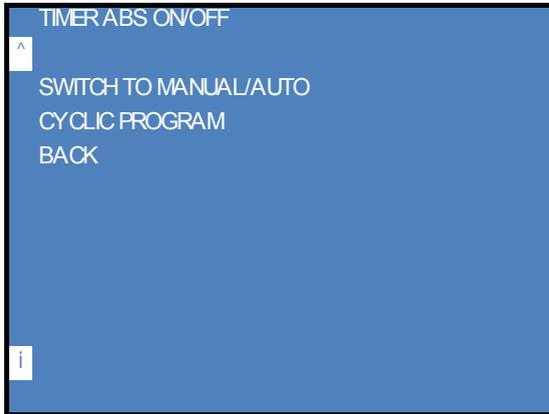
- Change the parameters if necessary.
 - ›hysteresis (K)‹: Switch-on hysteresis cooling pump (=solar pump)
The buffer temperature must be above the collector temperature by the set value.
(Setting range: 0-99 K)
 - ›storage max °C‹: Here: Maximum temperature collector
When cooling pump (=solar pump) is exceeded: OFF
(Setting range: 0-99 K)The storage tank recooling is controlled by the internal logic controllers.
"Change values" on page 23

- Select ›PUMP SETTINGS‹ in the ›SOLAR UNIT‹ menu.



- Change the ›stop delay time (sec)‹ and the ›switch on delay (min)‹ if necessary.

- Select ›TIMER ABS ON/OFF‹ in the ›PUMP SETTINGS‹ menu.



Timer for the solar pump anti-lock circuit (ABS).

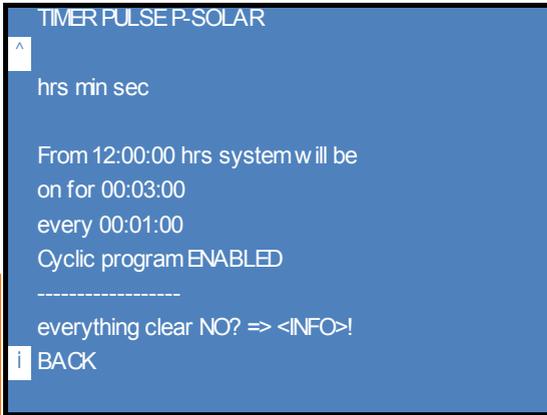
In the ›CYCLIC PROGRAM‹ menu the switch-on interval and the switch-on time of the solar pump are defined. The circuit is active every Monday from September to May.

- Select ›SWITCH TO MANUAL/AUTO‹ in the ›TIMER ABS ON/OFF‹ menu.



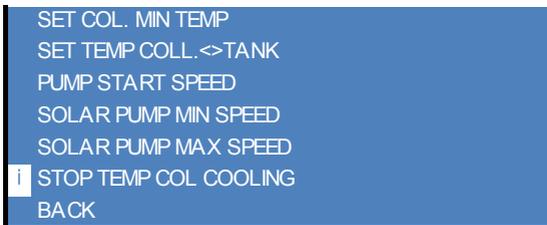
- Change the parameters if necessary.
In this menu the time switch and thus the anti-lock circuit for the solar pump can be deactivated.
 - ›AUTOMATIC‹: ABS is activated for the above period.
 - ›ALWAYS ON‹: *do not select!*
 - ›ALWAYS OFF‹: ABS is deactivated

- Select ›CYCLIC PROGRAM‹ in the ›TIMER ABS ON/OFF‹ menu.



- Change the parameters if necessary.
Here the switch-on interval and the switch-on time of the solar pump are defined. The circuit is active every Monday from September to May.

- Select further settings in the ›SOLAR UNIT‹ menu.



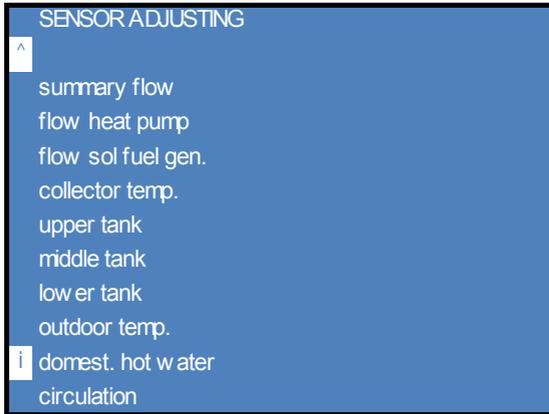
- Change the parameters if necessary.
 - ›SET COL. MIN TEMP‹ - ›limit value‹: Setpoint collector minimum temperature
Release of the solar pump from this value
(Factory settings: 35 °C, setting range: 0 - 50 °C)
 - ›SET TEMP COLL.<->TANK‹ - ›limit value‹: Setpoint for differential temperature of collector storage tank
Control variable for the modulation of the solar pump
(Factory settings: 10 K, adjustment range: 0 - 25 K)
 - ›PUMP START SPEED‹ - ›limit value‹: Solar pump start speed setpoint
Start speed - PWM signal in %
(Factory settings: 50%, adjustment range: 0 - 100%)
 - ›SOLAR PUMP MIN SPEED‹ - ›limit value‹: Minimum speed solar pump
Minimum speed during operation in %
(Factory settings: 20%, adjustment range: 0 - 50%)
 - ›SOLAR PUMP MAX SPEED‹ - ›limit value‹: Maximum speed solar pump

Maximum speed during operation in %
 (Factory settings: 80%, adjustment range: 50 - 100%)

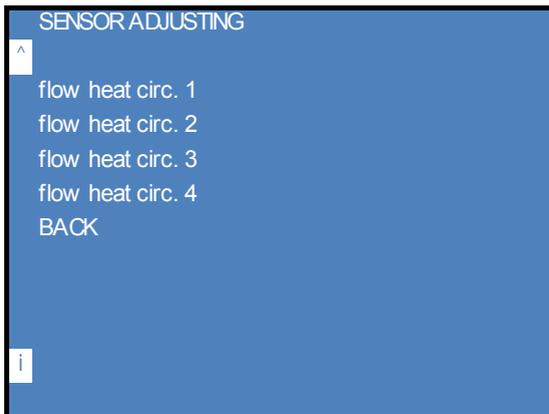
- ›STOP TEMP COL COOLING‹ - ›limit value‹: Minimum temperature for stopping the storage tank recooling
 Stop storage tank recooling at the set value
 (Factory settings: 82°C, setting range: 0 - 90°C)
 "Change values" on page 23

Sensor adjustment

- Select ›SENSOR ADJUSTING‹ from the ›COMMISSIONING‹ menu.



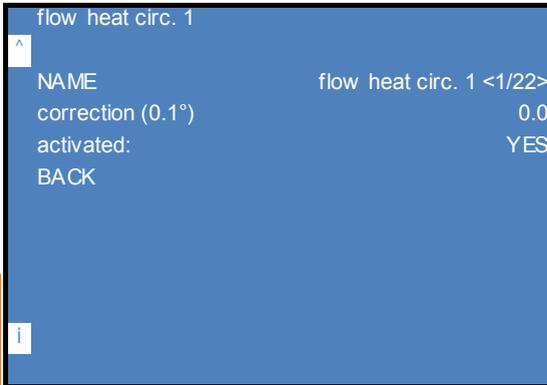
(Menu page 1, example, depending on the selected system)



(Menu page 2, example, depending on the selected system)

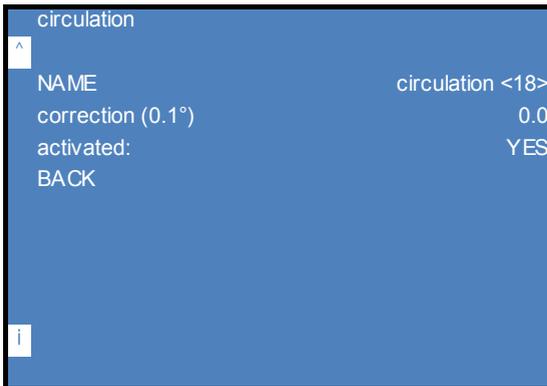


- Select a temperature sensor.



A screenshot of a blue configuration screen. At the top, it says 'flow heat circ. 1'. Below that is a small upward-pointing triangle icon. The screen displays the following text: 'NAME flow heat circ. 1 <1/22>', 'correction (0.1°) 0.0', 'activated: YES', and 'BACK'. At the bottom left, there is a small 'i' icon.

(Example for heating circuit, depending on the selected system)



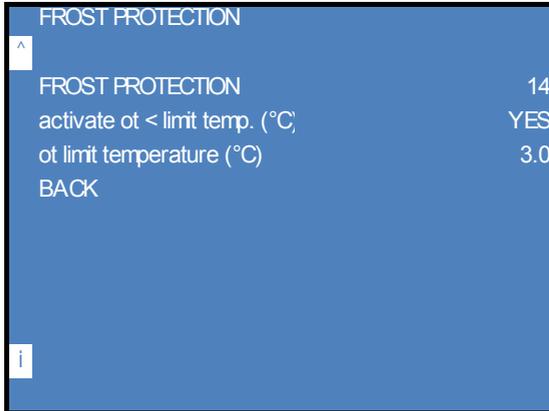
A screenshot of a blue configuration screen. At the top, it says 'circulation'. Below that is a small upward-pointing triangle icon. The screen displays the following text: 'NAME circulation <18>', 'correction (0.1°) 0.0', 'activated: YES', and 'BACK'. At the bottom left, there is a small 'i' icon.

(Example for circulation, depending on the selected system)

- Change the name of this temperature sensor if necessary.
 - Set a temperature correction (offset) if necessary.
 - ›correction (0.1°)‹: Temperature deviation from measured value $\pm 10K$ (setting range: -10 to +10)
 - ›activated‹: Enabling/disabling the function in the system (Factory settings: ›YES‹, setting range: ›YES‹/›NO‹)
Note: Only 'non-critical' components can be deactivated, i.e. only sensors and pumps/mixers that are not absolutely necessary for the selected system.
- “Change values” on page 23

Configuring frost protection

- Select ›FROST PROTECTION‹ in the ›COMMISSIONING‹ menu.

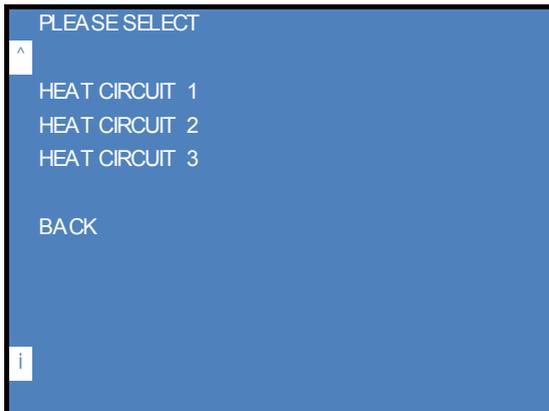


Here you activate or deactivate the frost protection and define the limit temperatures for the frost protection.

- ›FROST PROTECTION‹: Antifreeze temperature
- ›activate ot < limit temp. (°C)‹: Activate frost protection
- ›ot limit temperature (°C)‹: Outdoor temperature - antifreeze threshold

Configuring the room controller ›CONFIG RC‹

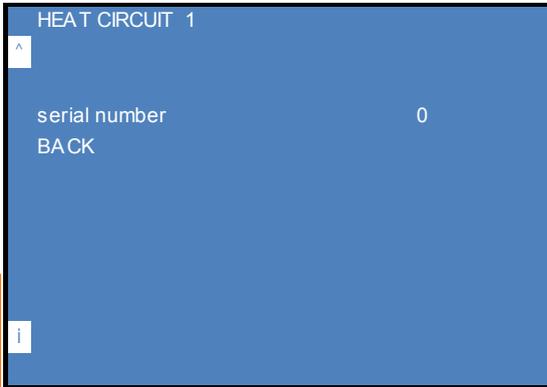
- Select CONFIG RC in the COMMISSIONING menu.



(Example, depending on the selected system)

- Select a heating circuit, e.g. ›HEAT CIRCUIT 1‹ .
Make the settings for the other heating circuits accordingly.

The menu for entering the serial number of the assigned room controller smart Econ appears.



- Set the serial number of the smart Econ room controller for the relevant heating circuit.
"Node number room controller" on page 51
"Change values" on page 23

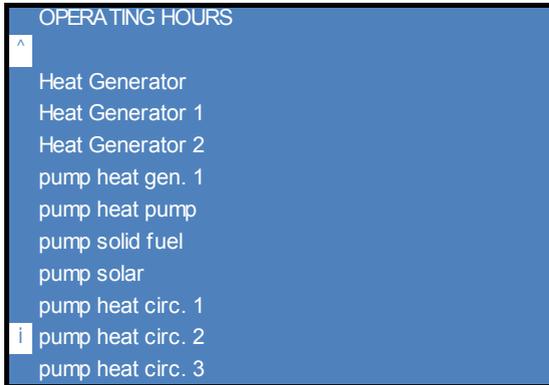
NOTE

Room temperature control for this heating circuit is active if the outdoor temperature control is deactivated.

When the outdoor temperature control is activated, the room controller is only used for setpoint adjustment.

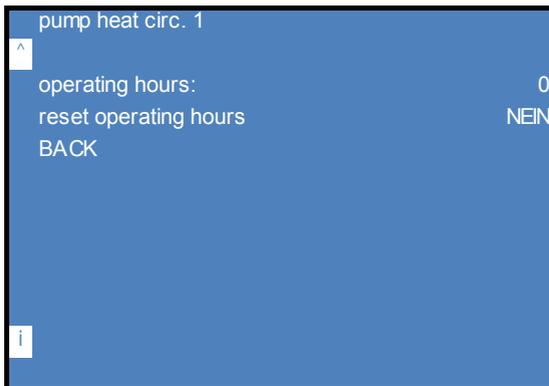
In the setting Serial number = 0, the relevant room controller is deactivated.

› OPERATING HOURS Menu



(Example, depending on the selected system)

- Select a component.

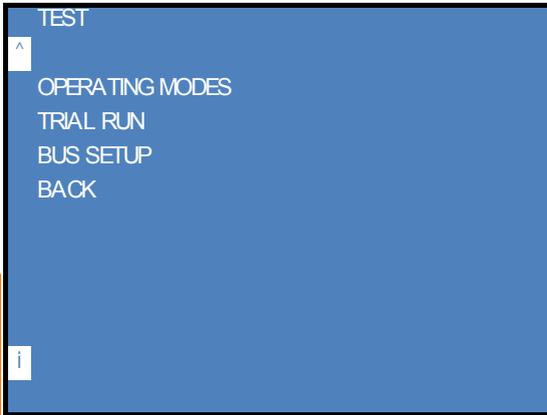


The operating hours of the individual components are displayed.

- For example, if the component has been replaced: Select › Srvc.Hrs.Reset‹.



›TEST‹ Menu

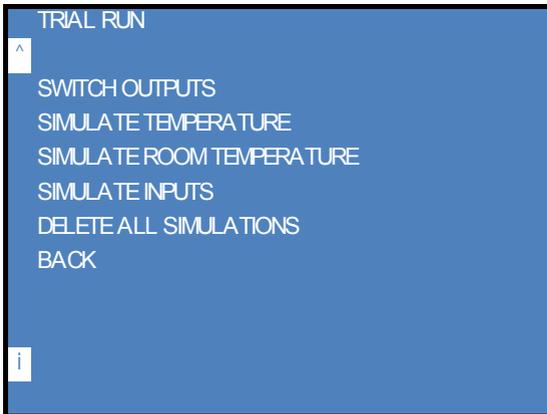


In the ›TEST‹ menu you can change the operating mode (“›OPERATING MODES‹ menu” on page 27), simulate operating states and set up the bus.

Note: A simulation is only possible in ›OFF‹ operating mode.

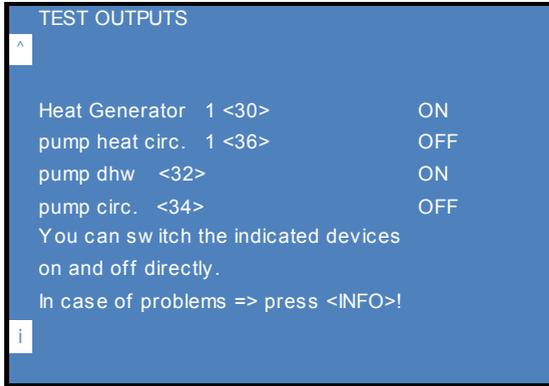
Test operation

- Select ›TRIAL RUN‹ in the ›TEST‹ menu.



Manual switching of outputs

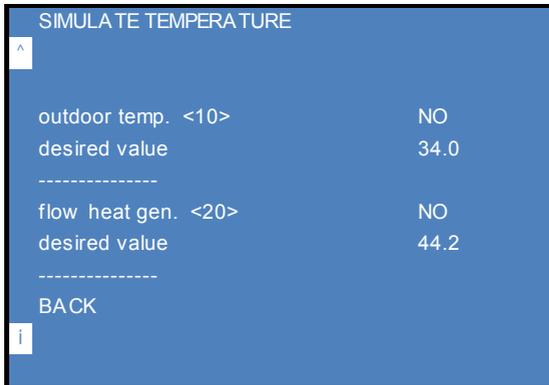
Note: To do this, first set the operating mode for the ›ENTIRE UNIT‹ to ›OFF‹.



(Example, depending on the selected system)

- Select an output and change the switching status if necessary. "Change values" on page 23

Simulate temperatures



(Example, depending on the selected system)

- Select the desired temperature sensor and change the desired temperature if necessary. First set the temperature sensor to be simulated to ›YES‹, then set the desired value. "Change values" on page 23



Simulate room temperatures

```
SIMULATE TEMPERATURE
^
HEAT CIRCUIT 1          NO
desired value          25.0
-----
HEAT CIRCUIT 2          NO
desired value          20.0
-----
BACK
i
```

(Example, depending on the selected system)

- Select the desired heating circuit and change the desired temperature if necessary. “Change values” on page 23

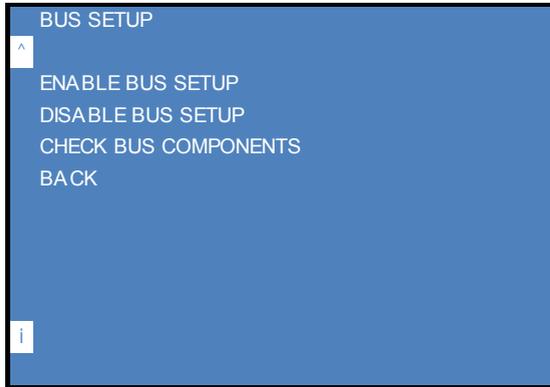
Simulate inputs

```
SIMULATE INPUT VALUE
^
req extern <24>          NO
Contact open=0, closed=3  0
-----
BACK
i
```

(Example, depending on the selected system)

- Select the desired input and change the desired value if necessary. “Change values” on page 23

Bus setup



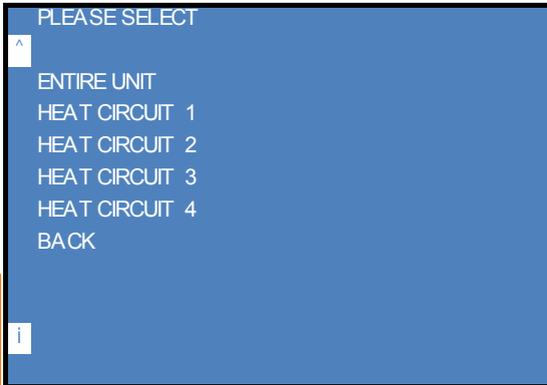
In the menu ›BUS SETUP‹ you can deactivate or activate the CAN-bus and check the bus components.

“CAN bus line” on page 15

Note: Bus setup can take some time!



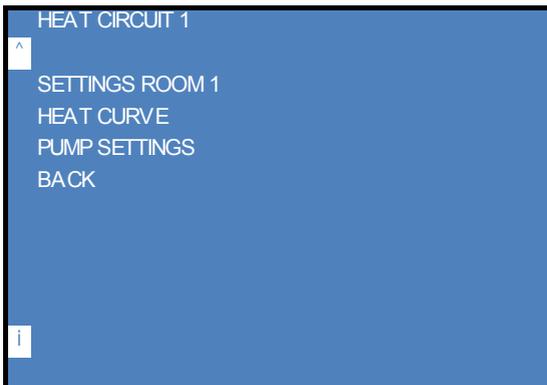
›HEAT CIRCUITS‹ menu (Installer)



(Example, depending on the selected system)

The ›HEAT CIRCUITS‹ menu shows the global set points and a selection of heating circuits.

- Change the global values applicable to all heating circuits, if necessary. The parameters ›global day temp.(°C)‹ and ›global eco temp. (°C)‹ offer the option of entering room setpoint temperatures centrally. Provided that the use has been enabled for the respective heating circuit, see the parameters ›use global day temp.‹ and ›use global eco temp.‹ (see below).
- Select a heating circuit, e.g. ›HEAT CIRCUIT 1‹. Make the settings for the other heating circuits accordingly.



(Example, depending on the selected system)

Configure heating circuit

- Select ›SETTINGS ROOM1‹ in the ›HEAT CIRCUIT 1‹ menu.
(Example, depending on the selected system)

SETTINGS ROOM 1	
^	
NAME	SETTINGS ROOM 1
current set point (°C)	0
use global day temp.:	NO
use global eco temp.:	NO
ROOM SETPOINTS	0
min request time (min)	1
switching hysteresis (0.1°)	3
time lag (0-10)	0
i	BACK

- Change the name of this temperature sensor if necessary.
- Change the setpoint temperature for this heating circuit, if necessary.
- Change other parameters if necessary.
 - ›min. request time (min)‹: Minimum time for falling below setpoint until heating requested (Setting range: 0 - 255 min)
 - ›switching hysteresis (0.1°)‹: Switching hysteresis for room temperature (x 0.1°C) (Setting range: 0 - 99)
 - ›time lag (0-10)‹: Inertia compensation, advance heating time (0= direct ON/OFF, 3= delay for radiators, 6= delay for underfloor heating) (Setting range: 0 - 10)
 - With the settings ›use global day temp.‹ => ›YES‹ and ›use global eco temp.‹ = ›YES‹ the global setpoint temperatures for this heating circuit are used.
 “›HEAT CIRCUITS‹ menu (Installer)” on page 130
 “Change values” on page 23

See also “›HEAT CIRCUITS‹ menu” on page 36



**Configuring room temperature influence on the heating curve
(heating circuits without mixer)**

- For example, select ›HEAT CURVE‹ in the ›HEAT CIRCUIT 1‹ menu.
(Example, depending on the selected system)

HEAT CURVE	
current set point (°C)	0
shift heating curve	0.0
minimum supply temp. (°C)	20
maximum supply temp. (°C)	65
set point at <1>°:	60
set point at <2>°:	53
set point at <3>°:	44
set point at <4>°:	23
interval (sec)	30
Amplification (0.1Sec/K)	20

HEAT CURVE	
gain room influence	4
room influence limit (K)	25
economy mode	0
BACK	

- Change the parameters if necessary.

- Heating curve:

- ›set point at <1>°: Flow set point of the heating curve at P1 (-20°C) (setting range: P2 - 99)
 - ›set point at <2>°: Flow set point of the heating curve at P2 (-5°C) (setting range: P3 - P1)
 - ›set point at <3>°: Flow set point of the heating curve at P3 (+5°C) (setting range: P4 - P2)
 - ›set point at <4>°: Flow set point of the heating curve at P4 (+20°C) (setting range: 0 - P3)
- P1 to P4 see ›BASE OT HEAT CURVE‹ menu "Change heating curve" on page 113

"Change values" on page 23

- Room temperature influence:** The flow temperature is adjusted according to the set point deviation of a room. For example, if it is 'much too cold' in this room, the flow temperature is increased. The extent to which the flow temperature changes is calculated from the parameter 'Gain' given below.

›gain room influence: (Flow temperature change per °C deviation from room temperature)

This value multiplied by the setpoint deviation in the room results in a change in the flow temperature.

Example: It's 3 degrees too cold in the room. The room temperature influence factor = 2.

→ The flow temperature is increased by $3 * 2 = 6$ degrees.

room influence limit (K): Maximum limitation for increasing the flow temperature (K)

“Change values” on page 23

Configuring the mixer control (heating circuits with mixer)

- For example, select ›MIXER HEAT CIRC. 2‹ in the ›HEAT CIRCUIT 2‹ menu.
(Example, depending on the selected system)

MIXER HEAT CIRC. 2	
current set point (°C)	0
shift heating curve	0.0
minimum supply temp. (°C)	20
maximum supply temp. (°C)	50
set point at <1>°:	36
set point at <2>°:	34
set point at <3>°:	31
set point at <4>°:	22
interval (sec)	30
Amplification (0.1Sec/K)	20

MIXER HEAT CIRC. 2	
gain room influence	2
room influence limit (K)	10
economy mode	0
activated:	YES
BACK	

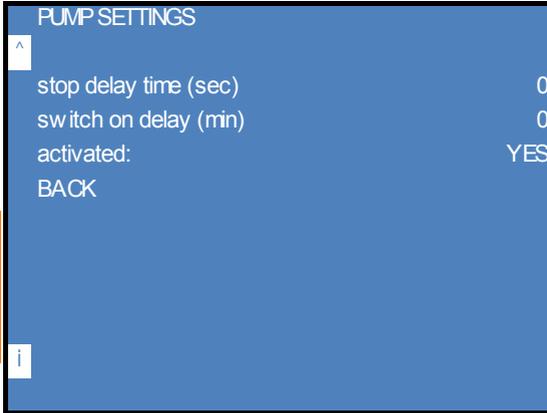
Note: Mixer circuits are always preset for underfloor heating!

- Change the parameters if necessary.
→ Page 132

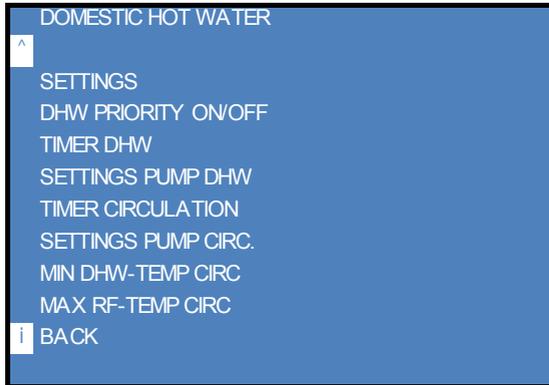


Configuring the heating pump

- For example, select ›PUMP SETTINGS‹ in the ›HEAT CIRCUIT 1‹ menu.
(Example, depending on the selected system)



- Change the parameters if necessary.
"Change values" on page 23

›DOMESTIC HOT WATER‹ menu (Installer)

(Example, depending on the selected system)

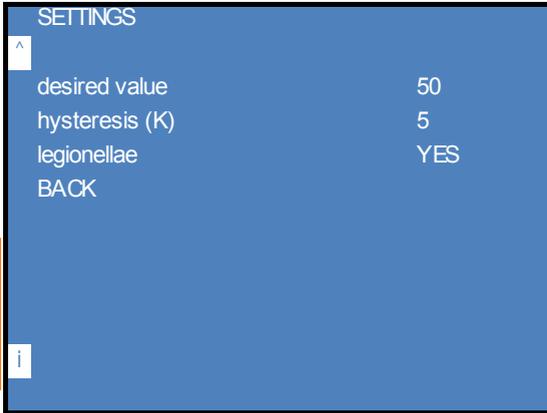
- “Setting the domestic hot water setpoint temperature (Installer)” on page 136
- “Configure domestic hot water priority” on page 137
- “Setting the domestic hot water heating times” on page 39
- “Configuring the domestic hot water pump” on page 137
- “Setting circulation times (Installer)” on page 138
- “Configuring the circulation pump” on page 138
- “Configure circulation temperatures” on page 139

See also “›DOMESTIC HOT WATER‹ menu” on page 38



Setting the domestic hot water setpoint temperature (Installer)

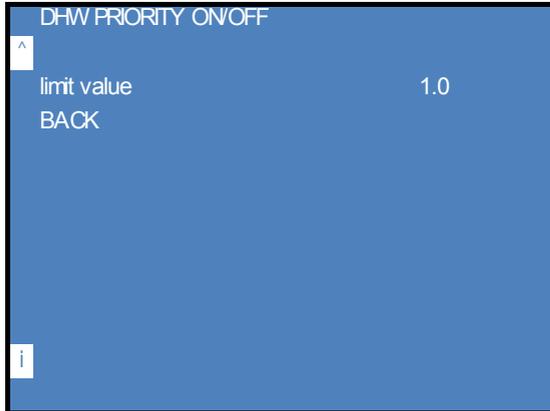
- Select ›SETTINGS‹ in the ›DOMESTIC HOT WATER‹ menu.



- Change the ›desired value‹ or the ›hysteresis‹ if necessary.
The pump is switched on as soon as the domestic hot water sensor value falls below the setpoint by the hysteresis.
It is switched off as soon as the setpoint is reached.
“Change values” on page 23
- Activate or deactivate ›legionellae‹.
If the function is activated with ›legionellae‹ ›YES‹ (default), the thermal disinfection program is carried out once a week every Monday. The domestic hot water is heated to 63°C to kill germs.

Configure domestic hot water priority

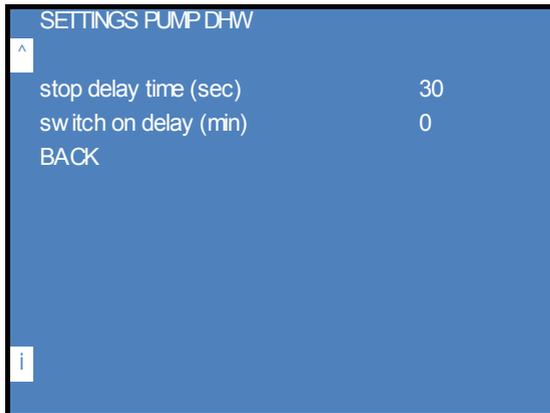
- Select ›DHW PRIORITY ON/OFF‹ in the ›DOMESTIC HOT WATER‹ menu.



- Change the ›limit value‹ if necessary.
 1.0 = Priority active
 0.0 = Priority disabled.
 “Change values” on page 23

Configuring the domestic hot water pump

- Select ›SETTINGS PUMP DHW‹ from the ›DOMESTIC HOT WATER‹ menu.

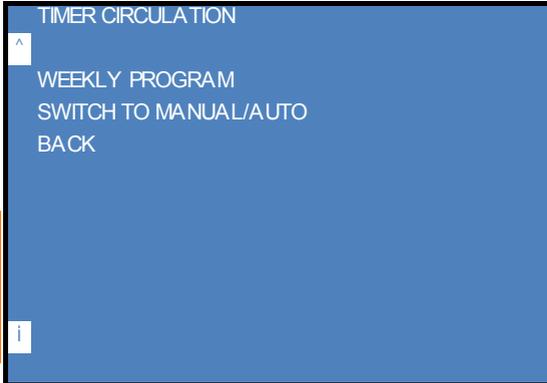


- Change the parameters if necessary.
 “Change values” on page 23



Setting circulation times (Installer)

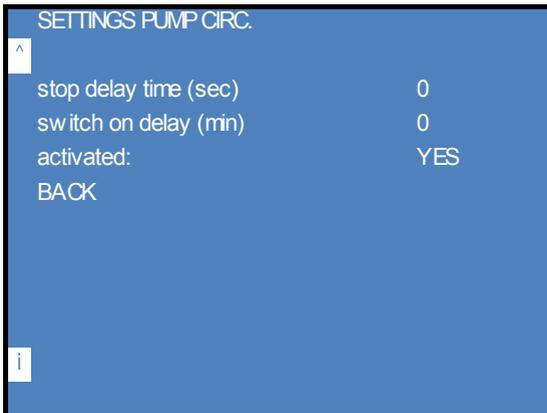
- To set the circulation times, select ›TIMER CIRCULATION‹ from the ›DOMESTIC HOT WATER‹ menu.



- You can change the circulation times via ›WEEKLY PROGRAM‹ in the same way as for “Setting the domestic hot water heating times” on page 39.
- To control the circulation manually, select ›SWITCH TO MANUAL/AUTO‹ in the same way as “Manual control of domestic hot water heating” on page 40.

Configuring the circulation pump

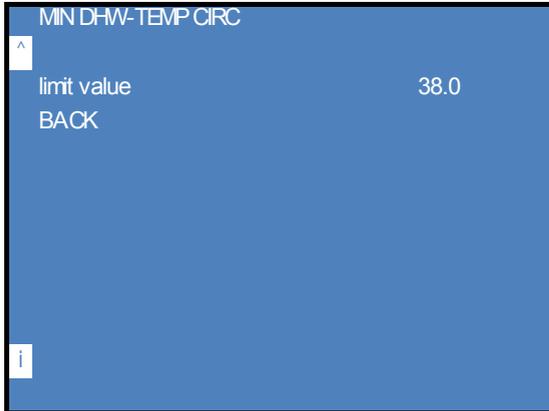
- Select ›PUMP SETTINGS CIRC‹ from the ›DOMESTIC HOT WATER‹ menu.



- Change the parameters if necessary.
“Change values” on page 23

Configure circulation temperatures

- Select ›MIN DHW-TEMP CIRC‹ in the ›DOMESTIC HOT WATER‹ menu.



- Change the ›limit value‹ if necessary.
Minimum storage tank temperature for release of circulation
(Factory settings: 38.0 °C, setting range: 0.0 - 95.0 °C)
“Change values” on page 23

- Select ›MAX RF TEMP CIRC‹ in the ›DOMESTIC HOT WATER‹ menu.

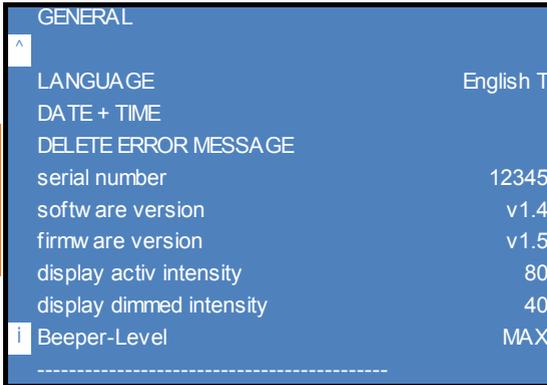


- Change the ›limit value‹ if necessary.
Maximum temperature in the return line of the circulation
Temperature is reached = circulation stops
(Factory settings: 38.0 °C, setting range: 0.0 - 85.0 °C)
“Change values” on page 23

If the temperature in the return line of the circulation is higher than the set limit value, the circulation pump is switched off. (The circulation system is flushed.)

NOTE	<p>The temperature sensor for the return line of the circulation must not be heated up by the storage tank.</p> <p>Install a few meters before the circulation inlet!</p>
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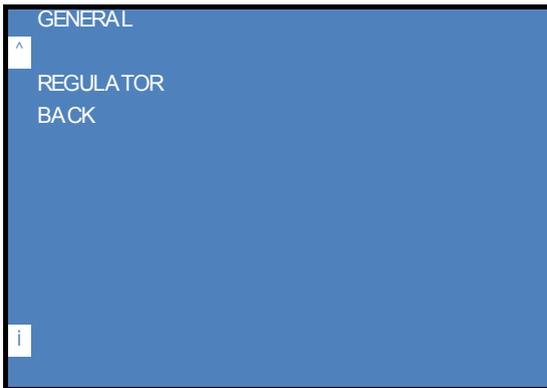
›GENERAL‹ menu (Installer)



In the ›GENERAL‹ menu you can view information about Userinterface and change general settings.

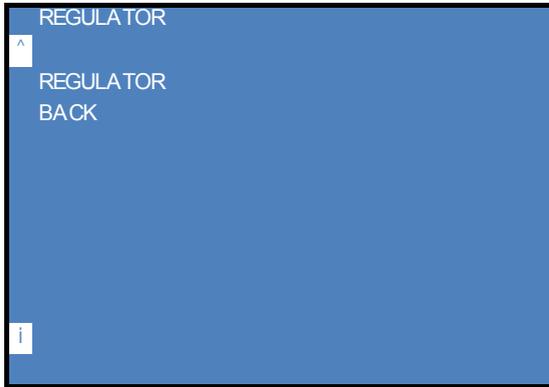
See also “›GENERAL‹ menu” on page 42

At installer level, you can also view information about the controller and check the bus structure (“Bus setup” on page 129).



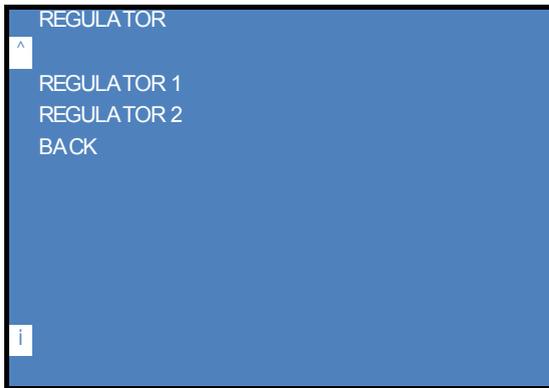
- Select ›REGULATOR‹ in the ›GENERAL‹ menu.

HCW 810:



- Select ›REGULATOR‹.

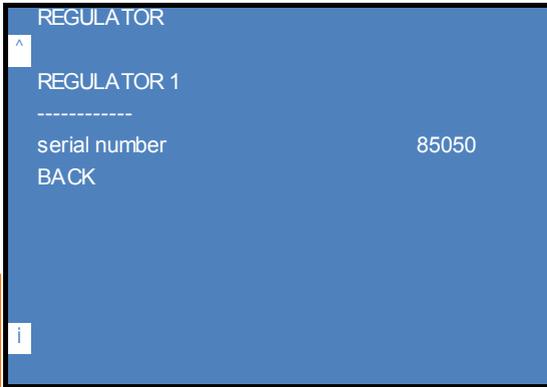
HCW 1620:



- Select ›REGULATOR 1‹ or ›REGULATOR 2‹.



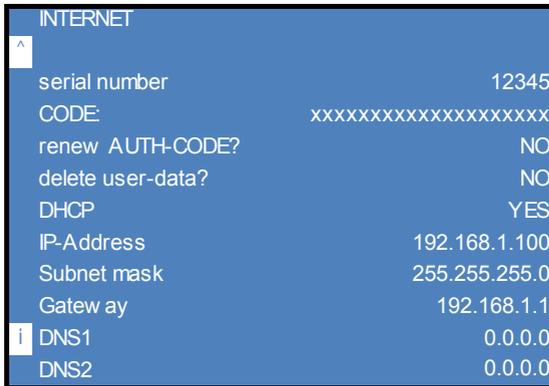
The serial number of the controller is displayed here.



(Example)

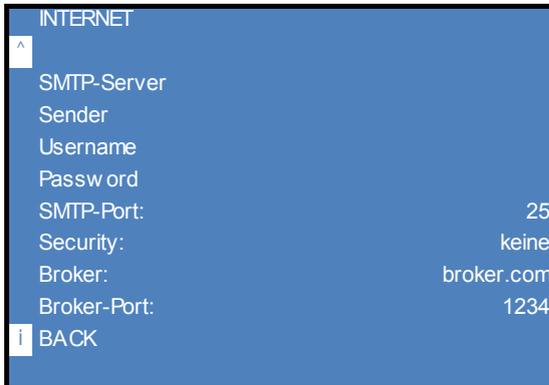
›INTERNET‹ menu (Installer)

In the ›INTERNET‹ menu you can view and change the network settings of the Userinterface.



See “›INTERNET‹ menu” on page 44

At the installer level you can also define settings for sending e-mails (SMTP) and configure the connection to the smart Econ Cloud.

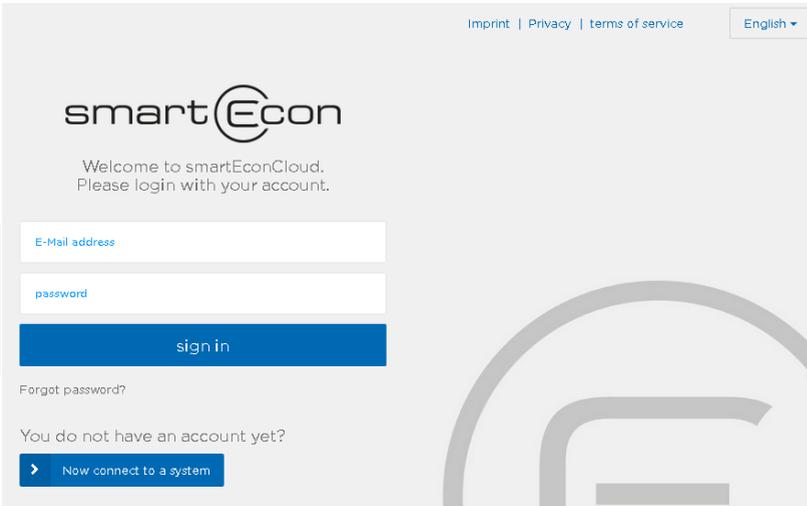


smart Econ Cloud setup

Prerequisites:

- The smart Econ Userinterface is connected to the network and thus to the Internet via a LAN cable. The network settings are configured correctly (DHCP activated or correct IP address etc. entered).
The status line of the display shows: "Server: online"
- To create a login, the user requires appropriate authentication data using the TAN procedure (TAN key / ID code not included)
In the ›INTERNET‹ menu, ›CODE‹ has a 20-digit authentication code (consisting of numbers and lower case letters)

Open your preferred browser and enter the following address in the URL line:
www.smarteconcloud.com



The screenshot shows the smartEconCloud login interface. At the top right, there are links for 'Imprint', 'Privacy', and 'terms of service', along with a language dropdown menu set to 'English'. The main heading is 'smartEcon' with a stylized 'E' in a circle. Below the logo, it says 'Welcome to smartEconCloud. Please login with your account.' The login form consists of two input fields: 'E-Mail address' and 'password'. Below these fields is a blue 'sign in' button. Underneath the sign in button, there is a link for 'Forgot password?'. At the bottom of the form, there is a message 'You do not have an account yet?' and a blue button with a right-pointing arrow labeled 'Now connect to a system'.

- Click on "Now connect to a system" and follow the instructions.
A new user is automatically created on the server.

A maximum of 13 users can be created.

Generate new Auth-Code

- You can generate a new authentication code via `>renew AUTH-CODE?<`.

This makes it impossible for people without access to the system to generate a new user on the system or to log in via Auth-code. However, existing users still remain valid.

Delete user

- Use `>delete user data?<` to remove the entire user table in the controller.
(Deleting individual entries is not possible for security reasons).

On the web interface via "Forgot password?" or new registration ("Now connect to a system") you can quickly and easily create users in the controller again though using the correct Auth-code.

Technical data

smart Econ HCW

Range of application	for wall mounting
Type of connection	Terminal connections
Wire cross sections	Output, mains: max. 1.5mm ² , Inlet: max. 1mm ² , Bus line: max. 4 x 0.5mm ²
Power supply	230 V~ 50Hz
Power consumption	max. 9 VA
Output load (per output)	max. 1 A
Total controller load	max. 6 A
Internal fuse	T6.3 A
Bus supply	supplies up to 10 room controllers with operating voltage
Ambient temperature range	+5°C to +40°C
Electrical protection class IP 20 (DIN EN 60529, for solar applications DIN EN 60730)	
Dimensions (width x height x depth)	220 mm x 217 mm x 59 mm

smart Econ Room controller

Range of application	for wall mounting
Ambient temperature range	+5°C to +40°C
rel. Humidity without temperature change	10% to 90%.
Electrical protection class	IP 20 (DIN EN60529)
Dimensions (width x height x depth)	c. 82 mm x 82 mm x 22.5 mm
Options	Blind cover or cover with area limitation

smart Econ Temperature sensor

Application limits and temperature range	-50 °C to +120 °C
Connection cable	Silicone, 1.5 m long

Solar and boiler temperature sensors

Sensor type	Immersion sensor
Temperature limit	up to 180°C temperature resistant
Connection cable	Silicone, 2.5 m long

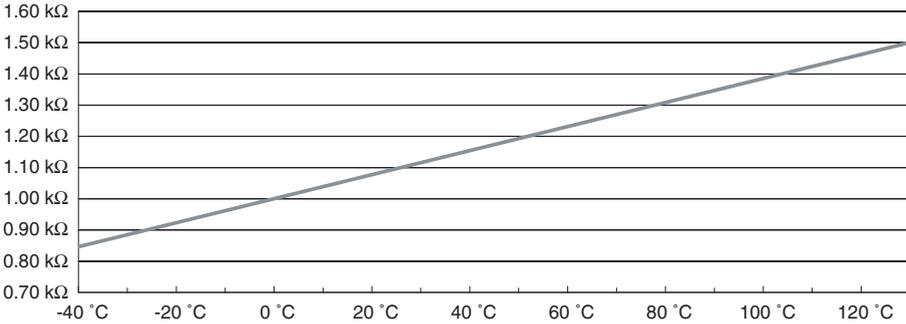
Storage tank and buffer temperature sensor

Sensor type	Immersion sensor
Temperature limit	up to 90°C temperature resistant
Connection cable	PVC, 2.5 m long

Flow/return contact temperature sensor

Sensor type	Pipe-mounted sensor
Temperature limit	up to 90°C temperature resistant
Connection cable	PVC, 2.5 m long

Characteristic curve and resistance values of PT1000 temperature sensors



-40 °C	0.85 kΩ	0 °C	1.00 kΩ	40 °C	1.15 kΩ	90 °C	1.35 kΩ
-30 °C	0.88 kΩ	5 °C	1.02 kΩ	50 °C	1.19 kΩ	100 °C	1.39 kΩ
-20 °C	0.92 kΩ	10 °C	1.04 kΩ	60 °C	1.23 kΩ	110 °C	1.42 kΩ
-10 °C	0.96 kΩ	20 °C	1.08 kΩ	70 °C	1.27 kΩ	120 °C	1.46 kΩ
-5 °C	0.98 kΩ	30 °C	1.12 kΩ	80 °C	1.31 kΩ	130 °C	1.50 kΩ

Disassembly/disposal

 DANGER	
	<p>Disassembly</p> <p>Danger of death by electrocution!</p> <p>Before opening the terminal cover, disconnect all poles of the power supply reliably and make sure they are not switched on again!</p>

To disassemble the smart Econ components, proceed in the reverse assembly procedure:

- Disconnect the power supply.
- Open the housing.
- Disconnect all cables.
- Release the wall screw fastenings.
- Remove the controller from its mounting location.

 DANGER	
	<p>Loose cables</p> <p>Danger of death by electrocution!</p> <p>When removing the heating system controller, insulate all stripped cable ends so that they cannot come into contact with bare skin!</p> <p>Remove all cables completely when disassembling the device!</p>

NOTE	<p>The person or institute responsible for disposing of the device may not dispose it with residual waste, but must ensure correct recycling in accordance with the local requirements!</p> <p>In case of doubt, ask the local disposal company or the authorized dealer from which you have purchased the device!</p>
-------------	--

Warranty and liability

The smart Econ home heating system controller was developed, manufactured and tested in accordance with strict quality and safety specifications and is state-of-the-art technology.

The device is subject to the statutory warranty period.

The seller will remedy all manufacturing and material defects of the product that arise during this warranty period and affect the correct functioning of the product.

Natural wear and tear does not constitute a defect.

Warranty and liability does not include damage caused by one or several of the following reasons:

- Non-compliance with these assembly and operating instructions.
- Inappropriate transportation
- Incorrect assembly, commissioning, maintenance or operation.
- Structural modifications or tampering with the device's software.
- Installation of supplementary components that have not been approved by the manufacturer.
- Continued use of the heating system controller despite an obvious defect.
- The use of spare parts and accessories that have not been approved by the manufacturer.
- Applications exceeding the intended use.
- Inappropriate use of the device, improper handling, e. g. ESD.
- Using the device outside of the permitted technical limits.
- Overvoltage, e. g. due to lightning strokes.
- Acts of nature.

Further claims based on this warranty obligation, especially compensation for damage exceeding the asset value of the heating system controller, are excluded.

Construction, design and project engineering of heating installations are performed by specialist installers based on the applicable standards and directives.

The functioning and safety of a device are the exclusive responsibility of the companies commissioned with planning and execution.

Contents and illustrations of this manual have been elaborated to the best of our knowledge and with utmost diligence - we reserve the right of errors and technical modifications.

Liability of the manufacturer for inappropriate, incomplete or incorrect information and all damage resulting therefrom is excluded categorically.

Index

Menu

- ›AUTOMATIC‹ 28
- ›CHIMNEY SWEEP‹ 29
- ›COMMISSIONING‹ 110
- ›CONFIG RC‹ 123
- ›COPY ALL VALUES...‹ 31
- ›COPY DAY...‹ 31
- ›DATE + TIME‹ 42
- ›DAY‹ 28
- ›DOMESTIC HOT WATER‹ 38
 - Installer 135
- ›FLOOR PAVEMENT HEATING‹ 28
- ›For diagnostics‹ 22
 - menu 22
- ›FROST PROTECTION‹ 28
- ›GENERAL‹ 42, 140
- ›HEAT CIRCUITS‹ 36
 - Installer 130
- ›Heat Circuits‹ 20
 - menu 20
- ›HOLIDAY PERIODS‹ 35
- ›INSTALLER‹ 109
- ›INTERNET‹ 44
 - Installer 143
- ›LANGUAGE‹ 42, 108
- ›MENU‹ 19
- ›NIGHT‹ 28
- ›OFF‹ 29
- ›OPERATING HOURS‹ 125
- ›OPERATING MODES‹ 27
- ›Outputs‹ 21
 - menu 21
- ›SUMMER‹ 28
- ›Temperatures‹ 21
 - menu 21
- ›TEST‹ 126
- ›TIMER PROGRAMS‹ 30
- ›TRIAL RUN‹ 126

A

Abbreviations

- for hydraulic components, inputs and outputs 100
- in menus 25

ABS 101

Access code

- entering 23

Air-source heat pump 102

Anti-legionella function 12

Antilock circuit 101

B

Boiler 57

Brightness

- Display 43

Buffer management 101

Bus setup 129

Buzzer volume 43

C

Cable routing 53

CAN bus 12

CAN bus line 15, 53

CAN-Bus

- Connection 53

Change

- heating curve 113

Change values 23

Characteristic curve

- PT1000 temperature sensor 146

Choose

- system 111

Circulation times 40, 138

Cleaning 10

Cloud 12

Collector cooling 101

Commissioning 107, 110

Commissioning mode 107

Conditions of use 9

Configure

- circulation pump 138
- circulation temperatures 41, 139
- control 132, 133
- domestic hot water priority 137
- domestic hot water pump 137
- heat pump 115
- heating circuit 131
- heating circuits 111
- heating curve 132
- heating pump 134
- mixer control 133
- request for heat generator 114

- room controller 123
- room temperature influence 132
- solar system 117
- solid fuel boiler 116
- zones 111
- Configuring
 - frost protection 123
- Connection 10, 45
 - CAN-Bus 53
 - room controller 52
 - user interface 50
- Connection diagrams 56
- Control
 - of heat generators 11
- Control elements 17
- Control loops 104
- Control options 12

D

- Date 42
 - Installer 111
- Deactivate
 - pump/mixer 56
 - temperature sensor 56
- Device description 14
- Diagnostics 22
- Dimensions
 - room controller 51
 - smartEcon HCW 47
- Disassembly 147
- Display 17
 - Brightness 43
- Disposal 147
- Distance communication 12
- Domestic hot water 38, 57
 - circulation times 40, 138
 - heating times 39
 - installer 135
 - manual control 40
 - priority 104
 - setpoint temperature 38, 136
 - temperature 103

E

- Enter access code
 - installer 108
- Error messages 22

- Expansion module 14
- Exposure to sunlight 11

F

- Flow line 57
- Flow temperature 11
- Frost protection 103
- Function buttons 17
- Function description 101
- Functional descriptions 17

G

- General 42
 - Installer 140
- Global day/night temperature 103

H

- HCW 14
- Heat Circuits 36
 - installer 130
 - Overview menu 20
- Heat exchanger 57
- Heat generator 11, 102
 - modulation 102
- Heat pump 57, 102
- Heating circuit 57
- Heating curve 104
- Heating periods 31
- Heating temperatures 31
- Heating times
 - domestic hot water 39
- Heat-up performance 11
- Help function 17
- HG request
 - configure 114
- Holiday 35
- Hydraulic separator 57
- Hydraulic symbols 57
- Hydraulic Systems 56
- Hysteresis
 - domestic hot water 136

I

- INFO button 17
- Input
 - simulation 128
- Installation 10, 45
 - room controller 52

- smartEcon HCW 49
- Installation location
 - room controller 51
 - smartEcon HCW 48
- Installer
 - Main menu 108
 - menu 109
- Intended use 10
- interfaces 15
- Internet 12, 44
 - Installer 143

L

- Language 108
- Legend
 - of hydraulic symbols 57
- Legionella 136
- Liability 148
- Limit temperature 101

M

- Main menu 26
 - installer 108
- Manual
 - switching of outputs 127
- Menu 18, 19, 26
 - set language 42
- Menu navigation 17
- Menu structure 24
- Menus 24
- Mixer 57, 104
 - deactivate 56
- Modulating heat generators 102

N

- Notes
 - on this manual 8

O

- OK button function 17
- Open
 - smartEcon HCW housing 48
- Opening the housing
 - room controller 51
- Operating hours 125
- Operating modes 27
- Operation
 - prompts 18

- settings 23

- smartEcon HM user interface 17
- smartEcon Room controller 16
- Outdoor temperature sensor 57
- Outdoor temperature-controlled room heating 11
- Outdoor temperature-controlled setting 104
- Outdoor temperature-guided control
 - with remote setting 105
 - with room temperature influence 106
- Outputs 21
- Overview menu 19
- Overview mode 18

P

- Peak load boiler 102
- Plate heat exchangers 57
- Product description 11
- Prompts
 - during operation 18
- PT1000
 - characteristic curve 146
- Pump 57
 - deactivate 56

Q

- Quick access 17

R

- RC 14
- Remote maintenance 12
- Remote setting 105
- Return line 57
- Room controller 11, 15, 105
 - connection 52
 - dimensions 51
 - installation 52
 - Installation location 51
 - opening the housing 51
 - serial number 51
 - technical data 145
 - use 105
- Room temperature influence 106
- Room temperatures
 - simulation 128
- Rotary/pushbutton 17

- S**
 - Safety information 8
 - Select
 - hydraulic system 111
 - menu items 19
 - Self-adjustment 11
 - Sensor
 - deactivate 56
 - Sensor balancing 121
 - Serial number
 - room controller 51
 - Set Language 42
 - Settings
 - during operation 23
 - Simulate
 - inputs 128
 - room temperatures 128
 - temperatures 127
 - Simulation
 - temperatures 127
 - smart Econ HCW 14
 - smart Econ RC 14
 - smart Econ temperature sensor 14
 - smartEcon
 - control options 12
 - room controller use 105
 - transmission technology 12
 - smartEcon HCW 14
 - dimensions 47
 - Expansion module 14
 - installation 49
 - installation location 48
 - Interfaces 15
 - open housing 48
 - technical data 145
 - smartEcon HM user interface
 - operation 17
 - smartEcon room controller 15
 - operation 16
 - technical data 145
 - smartEcon temperature sensor 46
 - characteristic curve 146
 - technical data 145
 - smartEconCloud 12
 - setup 143
 - Software switch 17
 - Solar collector panel 57
 - Solar heating system 12
 - Solar operation 101
 - Solid fuel boilers 57
 - Storage recooling 101
 - Summer operation 103
 - Switching functions 17
- T**
 - Technical data 145
 - Temperature sensor 14, 46, 57
 - characteristic curve 146
 - deactivate 56
 - technical data 145
 - Temperatures 21
 - Test 126
 - Test operation 126
 - Time 42
 - installer 111
 - Timer program 103
 - Timer programs 30
 - Transmission technology 12
 - Turn knob 17
- U**
 - User interface
 - connection 50
- V**
 - Volume 43
- W**
 - Warranty 148
 - Water heating 12

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