

Installation and user manual CHVAC Main Controller

Dear Customer,


Thank you very much for buying this appliance.

Please read through the manual carefully before using the product, and keep it in a safe place for later reference. In order to ensure continued safe and efficient operation we recommend that the product is serviced regularly. Our service and customer service organisation can assist with this.

We hope you enjoy years of problem-free operation with the product.

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1 Safety

1.1 General safety instructions

The general safety instructions warn against hazardous situations that arise when working with the appliance. These risks result from working on electrical and electronic equipment (risk of electric shock).

**Warning**

If a health impairment occurs when using the appliance or when working on the appliance

- Seek professional medical help.

1.1.1 Structure of the general safety instructions

**Danger**

Information on the type and source of danger

Consequences of ignoring the danger

- Information on avoiding the danger

The warnings start with a symbol as a warning sign and the signal word. The signal words Danger, Warning and Caution indicate possible consequences for the health of persons. The signal word Note indicates potential environmental and material damage. This type of safety-related information is designed to be conspicuous and highlighted in a grey box.

1.1.2 Working on electrical and electronic equipment

**Important**

All electrical work must only be carried out by authorised specialists.

When working on the electrical equipment, follow the instructions for installation, commissioning, service and spare parts replacement. For your safety, follow the specified connection requirements and the safety precautions.

**Danger**

Live lines and components while connecting system components

Risk of death from electric shock!

- While working on the system, switch off all external circuit breakers of appliances connected by the controller to ensure that the system is voltage-free and secure it against being switched back on.
- Before commencing maintenance and repair work, disconnect all appliances from power supply.
- Use a voltage tester to reliably determine that they are voltage-free.

1.2 Recommendations

**Important**

Only authorised experts are authorised to carry out assembly, installation and maintenance work on the appliance or system.

The CHVAC System is designed to control suitable heat producers to provide the required thermal energy for heating and domestic hot water. Boilers and heat pumps that have suitable interfaces can be controlled for heat generation.

**Caution**

Protect the appliance against building dust and water.

Improper use includes the following situations, for example:

- Operation with technical equipment that has been modified by the user.
- Operation with supply connections that have been modified by the user.
- Operation under ambient conditions other than those described.
- Operation outside of buildings (outdoors).

**Warning****Improper use**

This may result in physical injuries and material damage.

- Avoid improper use and improper manipulation of the appliance

1.3 Liabilities

1.3.1 Manufacturer's liability

Our products are manufactured in compliance with the requirements of the various Directives applicable. They are therefore delivered with the **CE** and **UK CA** marking and any documents necessary. In the interests of the quality of our products, we strive constantly to improve them. We therefore reserve the right to modify the specifications given in this document.

Our liability as manufacturer may not be invoked in the following cases:

- Failure to abide by the instructions on installing and maintaining the appliance.
- Failure to abide by the instructions on using the appliance.
- Faulty or insufficient maintenance of the appliance.

1.3.2 Installer's liability

The installer is responsible for the installation and initial commissioning of the appliance. The installer must observe the following instructions:

- Read and follow the instructions given in the manuals provided with the appliances and devices.
- Install the entire system in compliance with prevailing legislation and standards.
- Carry out initial commissioning and any checks necessary.
- Explain the installation to the user.
- If maintenance is necessary, warn the user of the obligation to check the appliance and keep it in good working order.
- Give all the instruction manuals to the user.

1.3.3 User's liability

To guarantee optimum operation of the system, you must abide by the following instructions:

- Read and follow the instructions given in the manuals provided with the appliance.
- Call on a qualified professional to carry out installation and initial commissioning.
- Get your installer to explain your installation to you.
- Have the required inspections and maintenance carried out by a qualified installer.
- Keep the instruction manuals in good condition close to the appliance.

2 About this manual

2.1 General

This manual is intended for authorised experts commissioned with assembly, commissioning, service, maintenance and repair work.

Before commencing work, please read this manual carefully. Pay particular attention to the safety instructions.

The manual includes inter alia:

- Information regarding installation and assembly of the product as well as the related requirements.
- Information regarding safe handling of the product.
- A description regarding commissioning of the product.



Important

The hydronic and electrical circuit diagrams are **schematic circuit diagrams** and **schematic sketches**.

Fittings required for hydronic connection as well as for safety-related and control-related purposes have to be designed and installed in compliance with both EU-regulations and national provisions.

2.2 Other documents

The present documentation refers to the installation and use of the *CHVAC Main Controller*.

Generic approved hydronic setups, approved system components and appliances to be operated together with the controller are described in a compendium of hydronic setups. This includes the respective electrical connections and controller settings. This documentation is available for authorised experts only. Contact your service organisation if you are an installer of a system containing this controller and need access to this documentation.



See

Hydronic Booklet - compendium of hydronic setups

When connecting other appliances to the controller, the documentation of the respective appliances has to be observed.

2.3 Symbols used

2.3.1 Structure of the safety instructions

The safety information in the following sections indicates the dangers arising in conjunction with the activities described, provide information on potential consequences, and shows how these dangers can be avoided.

The safety information is structured as follows:



Danger

Information on the type and source of danger

Consequences of ignoring the danger

- Information on avoiding the danger

The signal word indicates the severity of the hazard:

- **Danger!**
Any non-compliance will lead to death or severe injury.
- **Warning!**
Any non-compliance may lead to death or severe injury.
- **Caution!**
Any non-compliance may lead to personal injury.
- **Note**

Any non-compliance may lead to environmental and material damages.

2.3.2 Symbols used and typographical distinctions

The following symbols and typographical distinctions are used in this manual.



Important

Indicates important information.



See

Refers to other documents or chapters in this manual.

- Lists items are preceded by a bullet point.

1. Task steps are preceded by an ordinal number.

⇒ Task results are preceded by an arrow.



Task steps in illustrations are preceded by a number in a circle.



Helpful information or extra guidance.



Direct menu navigation, confirmations will not be shown. Use if you are familiar with the system.

[Buttons] are represented in bold font within square brackets.

Commands and **functions** are displayed in bold font.

Emphasised text for example for product names, file names or storage paths) is represented in *italics*.

3 Technical specifications

3.1 Homologations

3.1.1 Standards and Directives

This product complies with the requirements of the following European directives and standards:

Tab.1 Compliant with standards

Directive	Standard
2014/35/EU Low Voltage Directive	EN 60730-2-9:2019 +A1:2018
	EN60335-1:2012 +A1:2019 + A2:2019 + A11:2014 + A12:2017 + A13:2017 + A14:2019
2014/30/EU EMC Directive	EN55014-1:2017 +A11:2020
	EN55014-2:2015
2011/65/EU ROHS	
EC 1907/2006 REACH	

3.1.2 Regulations and standards

Beside the general technical rules, the relevant standards, regulations, ordinances and guidelines should be followed:

- EnEV Energy Saving Ordinance
- Regulations from the local electricity supplier
- Obligation to register (in some cases, Group Exemption Regulation)

3.2 Technical data

Tab.2 General data

		CHVAC Main Controller
Allowed ambient temperature	°C	0–40
Width × height × depth (maximum dimensions)	mm	440 × 300 × 125
Storage temperature	°C	-25 to 60
Relative humidity (non condensing)	%	0–95

Tab.3 Temperature controller product data sheet

Product name		CHVAC Main Controller
Class		II
Contribution to space heating energy efficiency	%	2



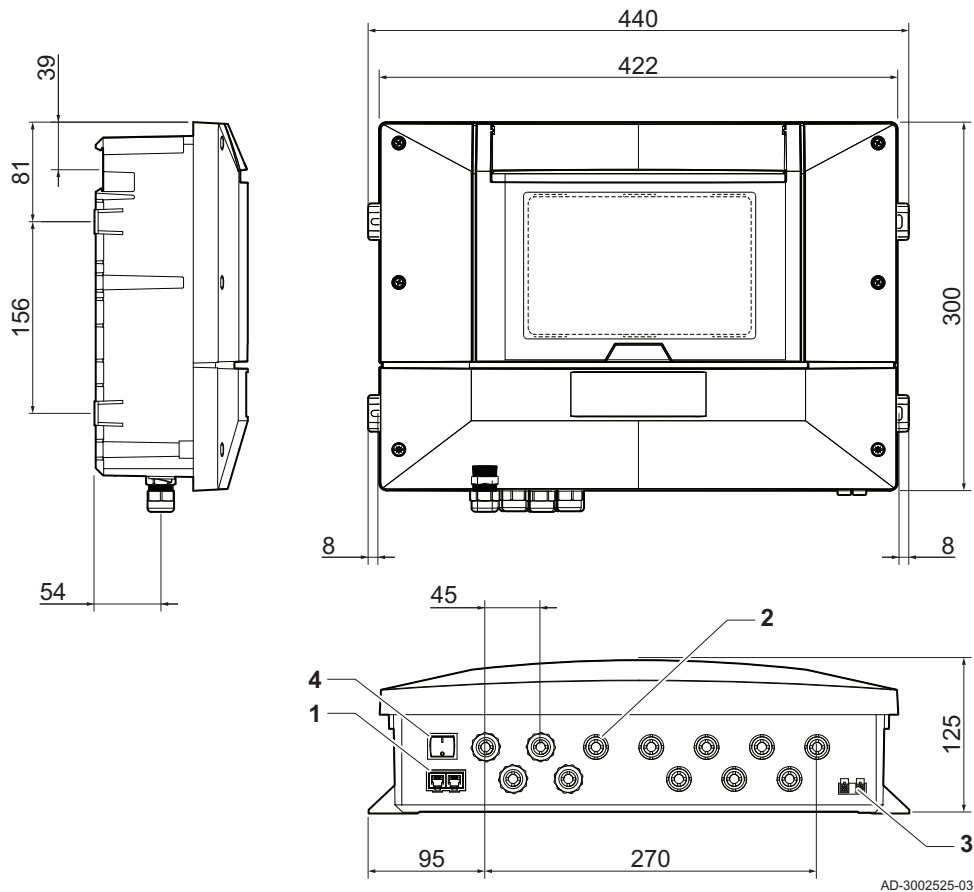
Important
The energy efficiency data listed above are valid for the CHVAC Main Controller alone as well as in combination with CHVAC System Extension.

Tab.4 Electrical data

		CHVAC Main Controller
Supply voltage	VAC	230
Power consumption (of CHVAC Main Controller only)	W	14

3.3 Dimensions and connections

Fig.1 Dimensions and connections




- 1

S-Bus connectors
- 2

Cable glands
- 3

L-Bus connectors
- 4

On/off switch


 The centre of the DIN rail is 39 mm from the top of the wall box.

4 Description of the product

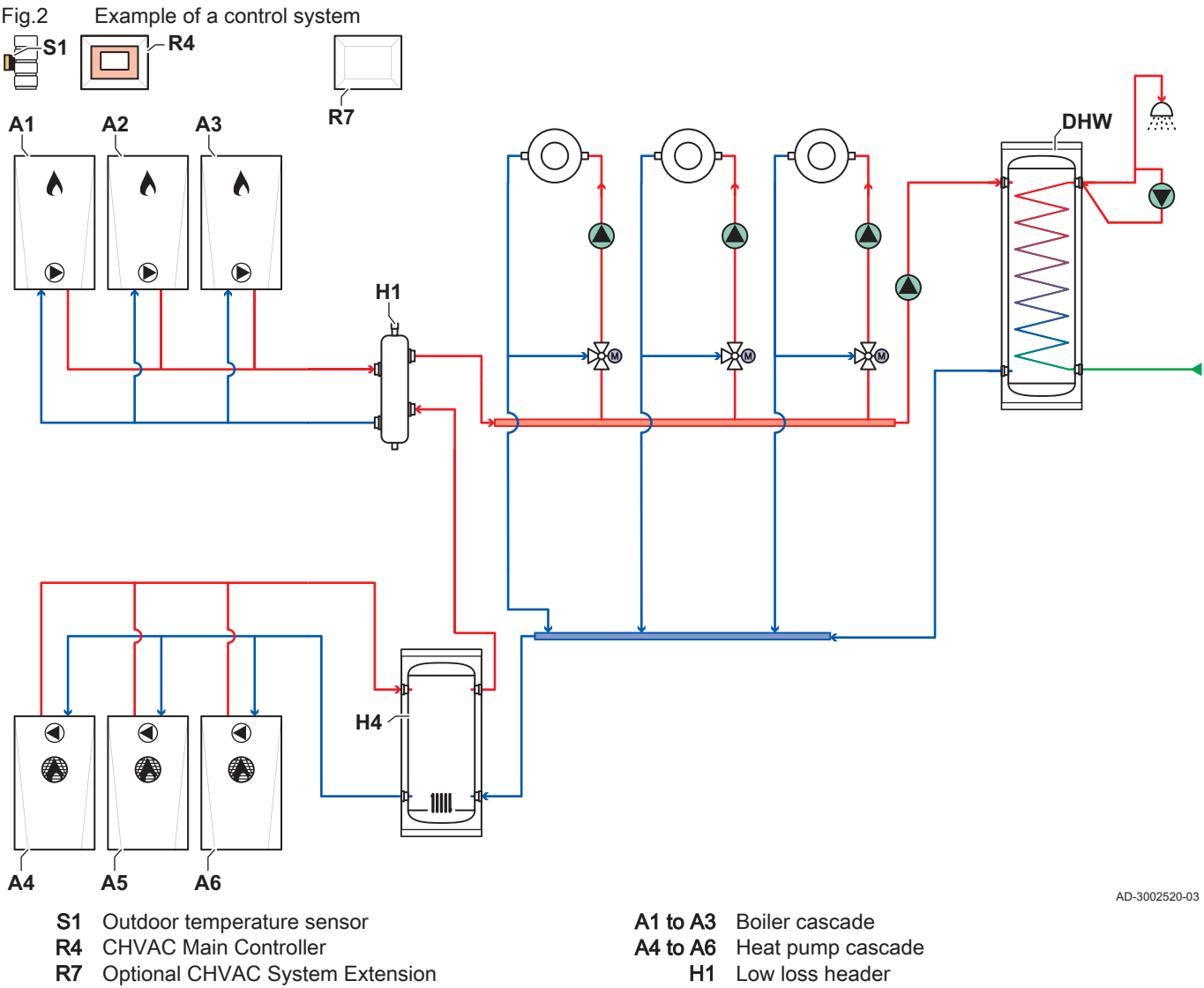
4.1 General description

CHVAC Main Controller is the basic element of a modular and flexible control system for complex heating systems which are to provide larger facilities with heat for central heating and domestic hot water preparation.


The CHVAC Main Controller can control two different producer types (boiler and heat pumps), the heat storage and distribution and the domestic hot water preparation. Control of heating zones is not provided by the system described here. Heating zones must be controlled by separate additional control units.



 The domestic hot water functionality and CHVAC System Extension are not yet available.

The modular approach allows the control unit to be adapted to the respective conditions in the building. Below see a possible application for building up a control system including CHVAC Main Controller:



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- H4** Buffer tank
DHW Domestic hot water (here hygienic tank)
 Pump

-  Heating circuit
 Mixing valve

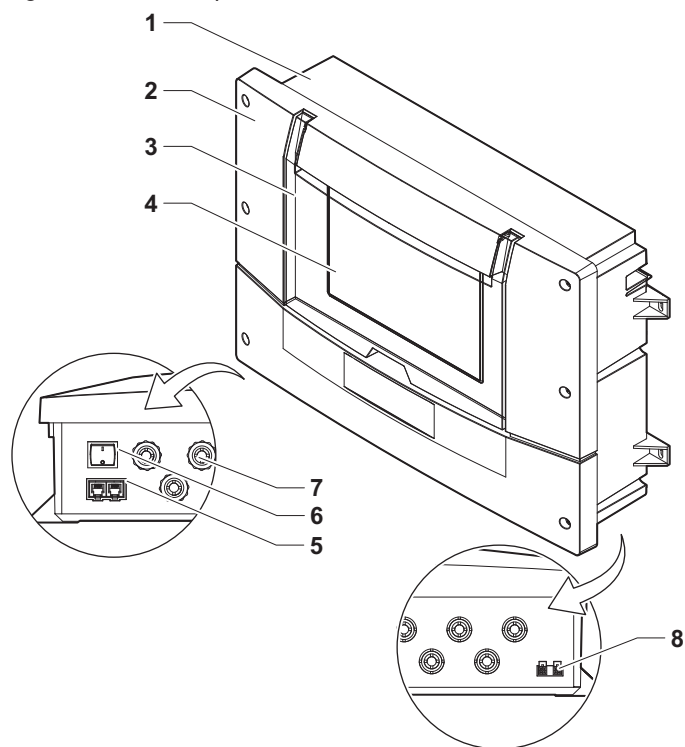


Important

The hydronic schematics are shown as functional basic circuit diagrams. The number of producers and zones is shown as an example. Hydronic and safety equipment must be designed and installed in accordance with national regulations.

4.2 Main components

Fig.3 Main components

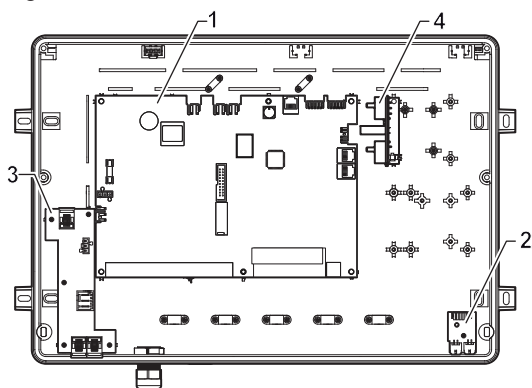


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- | | |
|-----------------|--------------------|
| 1 Casing | 5 S-Bus connectors |
| 2 Front cover | 6 Power switch |
| 3 Display cover | 7 Cable glands |
| 4 Touch display | 8 L-Bus connectors |

4.3 Implemented PCBs

Fig.4 PCB locations



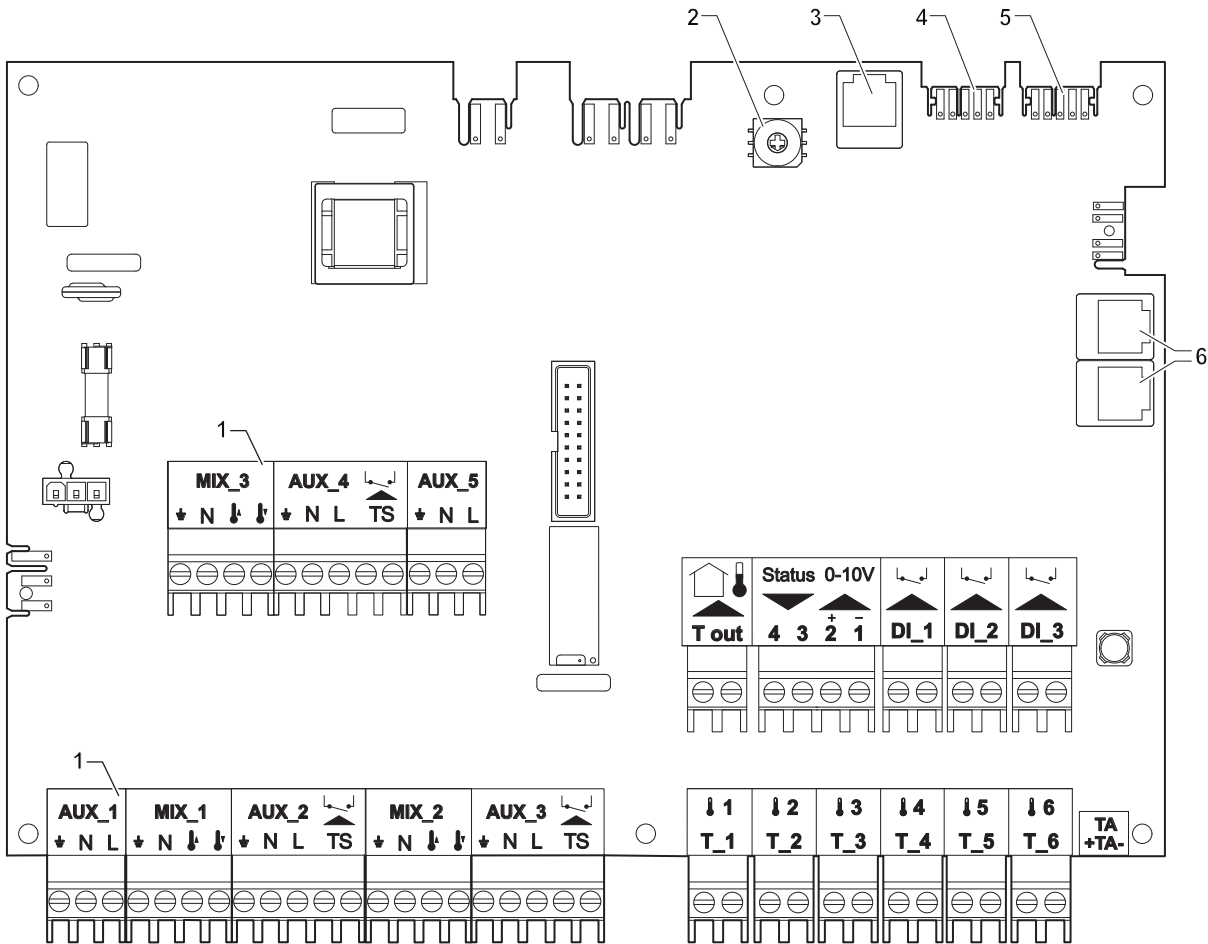
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- 1 IO-01
 2 CB-20
 3 CB-05
 4 CLK-01

4.3.1 Description of the PCB IO-01

Due to the modular conception of the CHVAC System, several connectors can be used for different purposes. The correct assignment depends on the realised hydronic solution of the whole system.

Fig.5 Elements of the PCB IO-01



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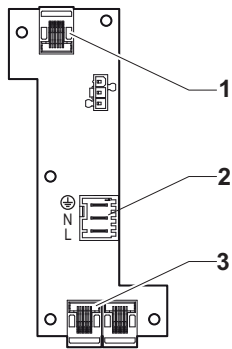


See also
Installation examples, page 37

4.3.2 Connectors of the PCB CB-05

The power supply and the S-bus connection to the controller are established via the connection of the PCB CB-05.

Fig.6 PCB CB-05

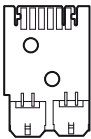


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- 1 Internal S-bus connection
- 2 Power supply
- 3 External S-bus connection

4.3.3 Description of the PCB CB-20

Fig.7 PCB CB-20



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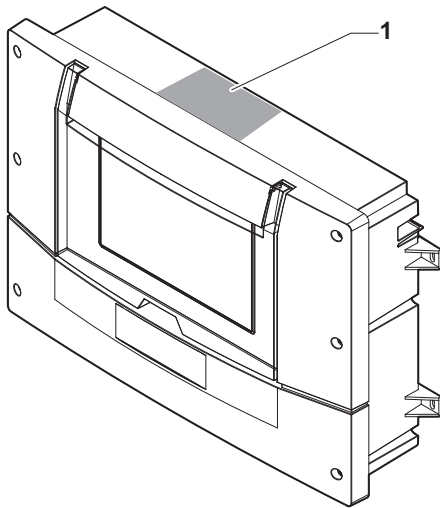
The PCB CB-20 provides easy access to the external L-bus connectors.

4.4 Data plate

The data plates must be accessible at all times. They identify the product and provide the following information:

- Appliance type
- Serial number
- CE identification number
- Electrical power supply

Fig.8



AD-3002535

- 1 Data plate



Important

Never remove or cover labels and data plates affixed to the appliances. Labels and data plates must be legible throughout the entire lifetime of the appliance. Damaged or illegible instructions and warning stickers must be replaced immediately.

4.5 Operating principle

CHVAC Main Controller allows control of complex systems of heat producers, storage tanks and domestic hot water producers. The controller provides an energy-efficient way to regulate the various producers of thermal energy, allows for storage of the generated energy and optimises distribution. The modular approach allows an optimised adjustment of controlling purposes to a wide range of requirements.

Heat preparation is controlled by CHVAC Main Controller.

- Cascades of boilers and/or heat pumps can be connected to the controller directly via S-bus or via available gateway boards that translate other protocols into the S-bus protocol. In case of S-bus connection to the controller, the regulation of producers is provided by the CHVAC Main Controller's software.

Heat storage in a buffer tank is normally controlled by the controller's regulation algorithm. Temperature sensors at the buffer tank and at the supply/return flow tubes deliver the information needed for energy-efficient loading and unloading of the buffer tank.

Domestic hot water preparation can be regulated as follows:

- If the entire process of preparation, storage and supply of domestic hot water is to be controlled, the available CHVAC System Extension is the solution of choice.



The domestic hot water functionality and CHVAC System Extension are not yet available.

Monitoring:

- CHVAC Main Controller allows the connection of various sensors, pumps or valves. Therefore most basic functionalities concerning sensor, on/off pumps or valve control are covered by this controller alone.
- If further requirements concerning monitoring issues occur, one or more extension controllers, where additional sensors can be connected, are applicable. The modular conception allows CHVAC System Extension to be used, for example, for control of domestic hot water and/or additional monitoring purposes, like pump or valve control.

Zone (heating circuit) control:

Control of zones by means of distribution control into the heating circuits is **not** provided by CHVAC Main Controller. Applicable zone controllers are optionally available.

BDR Thermea zone controllers provide the requested temperature setpoint via S-bus for CHVAC Main Controller. If no BDR Thermea zone controller is used, the CHVAC Main Controller provides an internal zone, which allows to define a setpoint for the hybrid system. The internal zone supports for example heating curve, time program and holiday mode. Nevertheless, neither actors nor sensors are required for this zone. For further external control by a building management system optional gateways are available.

4.5.1 Features

The controller has the following features:

- Allows for boiler and heat pump cascades of up to 10 units in total
- Allows for a buffer tank with two temperature sensors connected
- A control strategy via an outdoor temperature sensor
- Remote connectivity

4.5.2 Extending functionalities

The modular approach of the present control system allows for an application-specific adjustment of the system. The controller CHVAC Main Controller as a stand-alone appliance provides the functionalities listed above.

Further extensions to the controller are available as an option.

Additional functionalities provided by the CHVAC System Extension are for example:

- Control of domestic hot water supply
- Additional monitoring
- Control of additional sensors, pumps and valves

4.6 Standard delivery

The delivery includes:

- CHVAC Main Controller
- Mounting materials
- Outdoor temperature sensor (AF 60, NTC 470 Ohm)
- 2 × Contact temperature sensor (VF 60, NTC 10 kOhm)
- 2 × Immersion temperature sensor (KVT 60, NTC 10 kOhm)
- 2 × S-bus terminator
- L-bus terminator
- Documentation

This manual only deals with the standard scope of supply. For the installation or mounting of any accessories, please refer to the mounting instructions delivered with the accessories in question.

4.7 Accessories and options

- CHVAC System Extension
- GTW-251
- GTW-40
- GTW-25
- GTW-21
- GTW-08 Modbus
- S-bus cable (1.5 m) (AD308)
- S-bus cable (12 m) (AD309)
- S-bus cable (20 m) (AD310)
- Contact temperature sensor kit (AD199)
- Immersion temperature sensor kit (AD250)
- Zone controller

5 Before installation

5.1 Installation regulations



Important

The appliance must be installed by a qualified installer in accordance with local and national regulations.

5.1.1 Electrical power supply

Tab.5 Electrical information

Power supply voltage	230 VAC/50 Hz
Power supply	Single phase
Fuse on the PCB	6.3 AT



Caution

Please ensure the polarities shown on the terminals are followed, that is live (L), neutral (N) and earth (÷).



Caution

Fuse the electrical supply line in accordance with all current local and national regulations and standards.

5.1.2 Requirements for the electrical connections

- Establish the electrical connections in accordance with all current local and national regulations and standards.
- Electrical connections must only be made by qualified installers, and only while the power supply is disconnected.

- The appliance is completely pre-wired. Never change the internal connections of the control panel.
- Always connect the appliance to a well-earthed installation.
- The wiring must comply with the instructions in the electrical diagrams.
- Follow the recommendations in this manual.
- Separate the sensor cables from the 230 V cables

Make sure the following requirements are met when connecting the cables to the connectors:

Tab.6 PCB connectors

Wire cross section	Stripping length	Tightening torque
solid wire: 0.14 – 4.0 mm ² (AWG 26 – 12) stranded wire: 0.14 – 2.5 mm ² (AWG 26 – 14) stranded wire with ferrule: 0.25 – 2.5 mm ² (AWG 24 – 14)	8 mm	0.5 N·m

5.2 Installation requirements

The appliances must be installed by a certified professional in accordance with prevailing statutory texts and codes of practice.

The installation must comply in all respects with prevailing regulations and directives.

5.2.1 Connection of heat producers

For the connection of heat producers special restrictions apply:

- Currently, a total of 10 heat producers can be controlled by the modular control system. Up to 8 heat pumps and 8 boilers can be connected in series each. Nevertheless, the sum of producer units must not exceed 10.
- Any heat producers, like boilers or heat pumps, which shall be controlled have to be connected to the controller via S-bus.
- For heat pumps Modbus-to-S-bus connection via gateway, GTW-251 is applicable.



Important

The gateway will be delivered with its own housing and has to be placed indoors. For each individual heat pump a gateway GTW-251 must be used. The gateway GTW-251 is connected to the PCB CB-05.

- Boilers equipped with L-bus can be connected to the controller via the S-bus interface of an external gateway GTW-25.
- Boilers can also be connected by OpenTherm via gateway GTW-40.

5.2.2 Requirements for buffer tanks

For heat storage loading and unloading of a buffer tank can be controlled. The buffer tank has to be equipped with two temperature sensors, which have to be connected to the controller.



Important

Additionally required sensors must be ordered separately. Please note the correct type assignment.

5.2.3 Requirements for domestic hot water

Currently, control of domestic hot water preparation can be realised as follows:

- Domestic hot water preparation via system with hygienic tank
- Domestic hot water preparation via system with integrated plate heat exchanger (cooperative control between CHVAC System and *Aqua Cella* control unit)

**Important**

Please note:

- The domestic hot water functionality is provided by the CHVAC System Extension.
- The domestic hot water functionality is **not** provided by the zone controller.
- The domestic hot water functionality and CHVAC System Extension are not yet available.

5.2.4 Requirements for zone control

For heating zone control special restrictions apply:

- External zone controllers have to be connected to the controller via S-bus.
- A maximum of three external zone controllers can be connected. Therefore in total up to 12 zones can be controlled. These are 9 mixing zones and 3 direct zones.

**See**

See the respective zone controller manual for further information.

- If no BDR Thermea zone controller is used, the CHVAC Main Controller provides an internal zone, which allows to define a setpoint for the hybrid system. The internal zone supports for example heating curve, time program and holiday mode. Nevertheless, neither actors nor sensors are required for this zone.

**Important**

Please note:

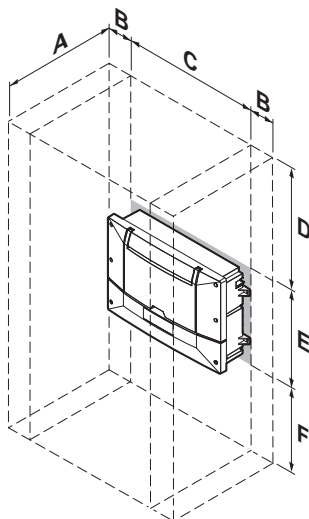
- The domestic hot water functionality is provided by the CHVAC Main Controller.
- The domestic hot water functionality is **not** provided by the zone controller.

5.3 Choice of the location

5.3.1 Location of the controller

- Use the guidelines and the required installation space as a basis for determining the correct place to install the appliance.
- Ensure that there is sufficient space around the appliance for good access and ease of maintenance.
- Install the controller indoors.

Fig.9 Installation area



- A 400 mm
- B 50 mm (Service area)
- C 440 mm
- D 300 mm (Service area)
- E 300 mm
- F 150 mm (Service area)



Make sure to leave enough clearance above the controller to open the front panel.

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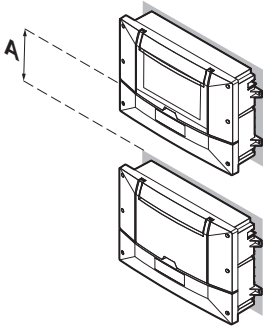
**Caution**

- Protect the appliance against dust.
- Protect the appliance against water.

5.3.2 Special requirements when using more than one controller

The modular CHVAC System may consist of more than one controller unit (CHVAC Main Controller and CHVAC System Extension). The following requirements concerning the location of the appliances have to be observed.

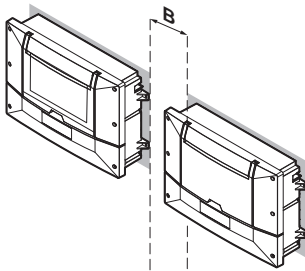
Fig.10 CHVAC Main Controller above CHVAC System Extension



AD-3002617

A 150 mm (service area)

Fig.11 CHVAC Main Controller next to CHVAC System Extension



AD-3002618

B 50 mm (service area)

- Determine an adequate installation site. To do so, observe the respective guidelines and the minimum space required.
- Ensure that there is sufficient space around any of the appliances for good access and ease of maintenance.
- Keep distances between the individual units as short as possible to enable easy connection of the devices.
- Always locate CHVAC Main Controller in such a way, that operators have unrestricted access to the touch interface.



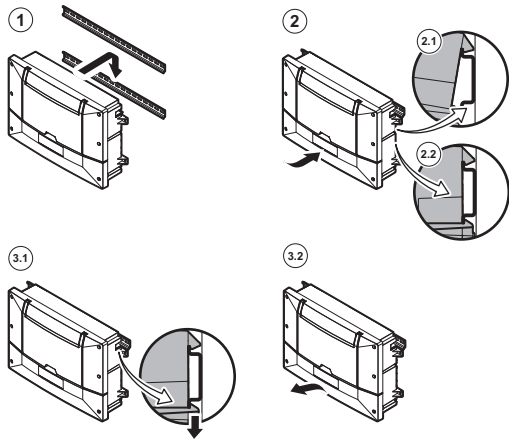
Make sure there is enough space above all controller housings so that the front panel can be opened.

6 Installation

6.1 Positioning the product

6.1.1 Mounting the controller on a DIN rail

Fig.12 Mounting on a DIN rail



AD-3002605

The fitting bracket on the back of the casing can be used to mount the appliance directly on a DIN rail (35 x 7.5 mm).



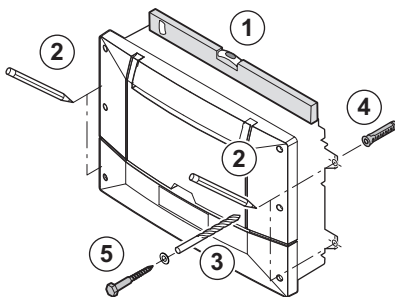
Caution

Protect the appliance against building dust and water.

1. Mount the rail. Make sure that the DIN rail is level.
Please refer to the mounting instructions of the rail for more information.
2. Mount the appliance using the fitting bracket on the back of the casing:
 - 2.1. Position the appliance on the rail.
⇒ The appliance is suspended on the top hooks of the fitting bracket.
 - 2.2. Push the appliance on the rail.
⇒ The appliance snaps into the bottom hooks of the fitting bracket.
3. To dismount the appliance from the rail.
 - 3.1. Press the two clickers at both sides of the housing.
 - 3.2. Pull the bottom of the appliance from the rail.

6.1.2 Mounting with the tabs

Fig.13 Mounting with the tabs



AD-3001947-01

The mounting tabs on the sides of the casing can be used to mount the appliance directly on the wall.



Caution

Protect the appliance against building dust and water.

1. Determine the position of the appliance. Make sure that the appliance is level.
2. Mark the positions of the 4 holes.
 - 2.1. 424 mm (width)
 - 2.2. 156 mm (height)
3. Drill the holes of Ø 6 mm.
4. Fit the Ø 6 mm plugs.
5. Secure with the Ø 3.5 mm screws.

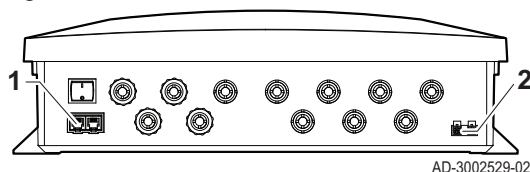
6.2 Electrical connections

6.2.1 Bus connections – general remarks

Some general remarks concerning S-bus and L-bus connections have to be observed.

Both types of bus connections consist of two bus terminators (one at each end of the bus), and a bus cable connection in between. Nevertheless, some differences between L-bus and S-bus connections and the controller have to be observed.

Fig.14 S-bus and L-bus connections



AD-3002529-02

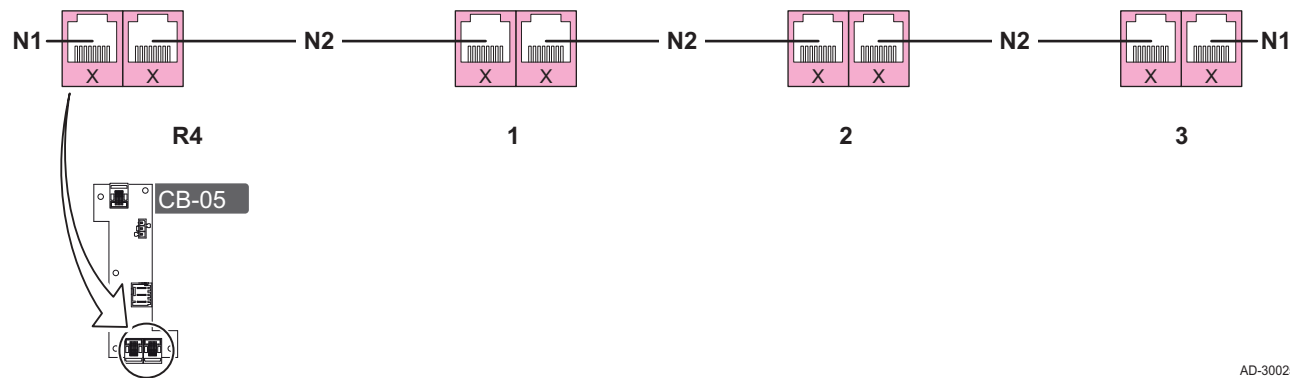
- 1 S-bus connectors
- 2 L-bus connectors

The bus connection examples below in this manual are possible sequences for bus connections and can vary based on configuration.

The location of the bus connectors for embedded appliances varies per device. Refer to the documentation of the respective device.

6.2.2 S-bus connections

Fig.15 S-bus connections



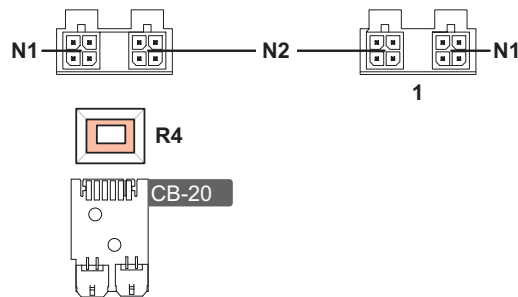
1 to 3 Producer, CHVAC System Extension, gateway or zone controller
R4 CHVAC Main Controller

N1 Bus terminator
N2 S-bus connection between appliances

- On the first device of the S-bus connection, a bus terminator is required on the bus inlet connector.
- The devices are linked with a bus cable. The cable connects the respective bus outlet to the bus inlet of the subsequent device.
- On the last device of the bus line, a bus terminator is fitted on the bus outlet connector.
- The sequence of the connected devices can be adjusted as desired. This also applies to CHVAC Main Controller.

6.2.3 L-bus connections

Fig.16 L-bus connections



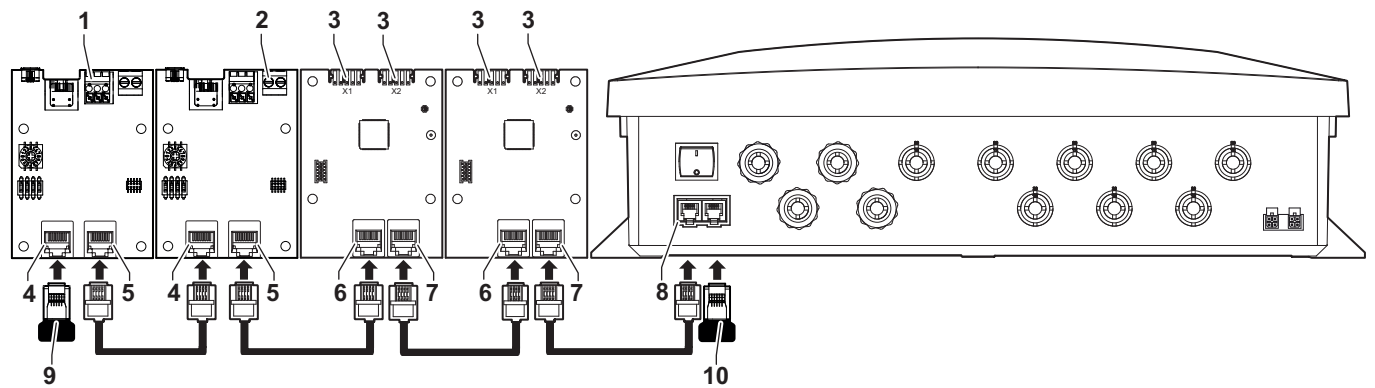
1 Gateway
R4 CHVAC Main Controller
N1 Bus terminator (integrated in CHVAC Main Controller)
N2 L-bus connection between appliances

Important
When connecting the CHVAC Main Controller via L-bus **no** terminator has to be fitted on the bus-inlet, because the inlet is by default equipped with a bus terminator.

- The devices are linked with a bus cable. The cable connects the respective bus outlet to the bus inlet of the subsequent device.
- On the last device of the bus line, a bus terminator is fitted on the bus outlet connector.

6.2.4 Connecting the cascade of heat pumps and boilers via gateways

Fig.17 External connections



AD-6000050-02

- 1 Modbus connection on GTW-251
- 2 OpenTherm connection on GTW-40
- 3 L-bus In/Out connection on GTW-25
- 4 S-bus In/Out connection on GTW-40/GTW-251
- 5 S-bus In/Out connection on GTW-40/GTW-251
- 6 S-bus In/Out connection on GTW-25
- 7 S-bus In/Out connection on GTW-25
- 8 S-bus In/Out connection on CHVAC Main Controller
- 9 S-bus terminator
- 10 S-bus terminator



Important

- The sequence in which the units are connected to the S-bus can be freely selected.
- An S-bus terminator must be installed at the beginning and the end of the S-bus connection.
- If the producer has an S-bus connector integrated, no gateway is needed. Then the producer can be connected directly to the CHVAC Main Controller.

6.2.5 Connection of heat pumps with Modbus



Important

For communication between CHVAC Main Controller and heat pumps via Modbus, for each heat pump an additional gateway (GTW-251) is required.



See

Documentation of GTW-251



See

Respective documentation of the connected heat pumps



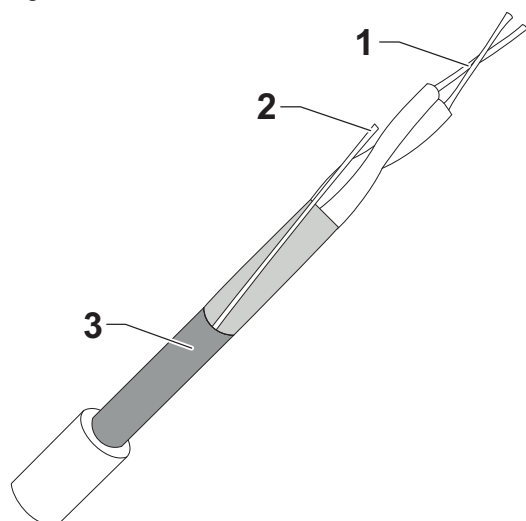
Important

Contact your local support organisation for information on supported heat pumps

■ Requirements for connecting gateway GTW-251 via Modbus

Some requirements for Modbus cables apply when connecting the heat pumps via gateway GTW-251 to the controller:

Fig.18 Modbus cable



AD-3002621-02

- 1 Twisted cable
- 2 Third common wire
- 3 Shielding

- Use a shielded cable (3).
- Use a cable with a third common wire (2).
- Use a cable with a characteristic impedance of 120 Ω.
- Use a twisted pair cable (1) with at least AWG 24 or 0.22 mm², for example 2 × 2 × 0.25 mm².
- The maximum cable length depends on the transmission rate, transmission speed, the wire cross-section, the quality of the cable and external influences etc. As a guideline, a maximum length of 300 m can be achieved.
- Connect the Modbus cable with end sleeves to the gateway GTW-251 and the heat pump.
- Connect the shield of the cable (3) with the ground/earth connection of the heat pump

**Important**

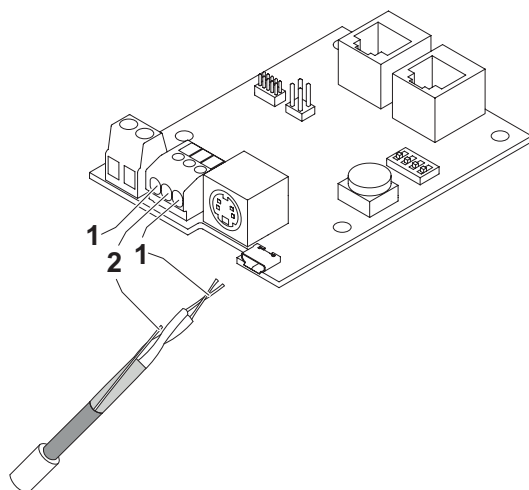
Do not connect the shield with the gateway GTW-251

■ Connecting the Modbus cable to gateway GTW-251

Connect the Modbus cable with the properties listed above with the Modbus connector of the gateway GTW-251 as follows:

- 1 Twisted cable
- 2 Third common wire

Fig.19 Connection of Modbus cable to gateway GTW-251

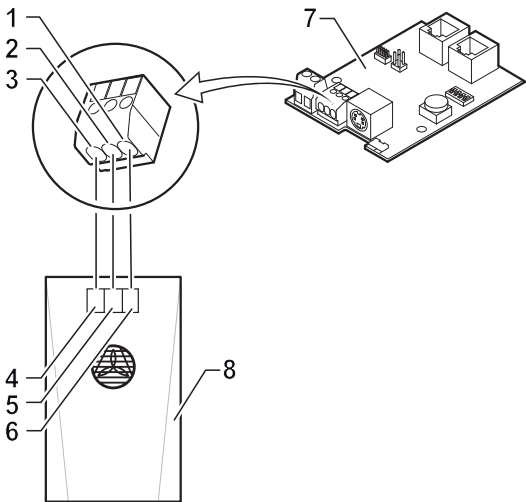


AD-3002622-02

■ Connecting the heat pump to gateway GTW-251 via Modbus

Connect to the heat pump as follows:

Fig.20 Connection to the heat pump

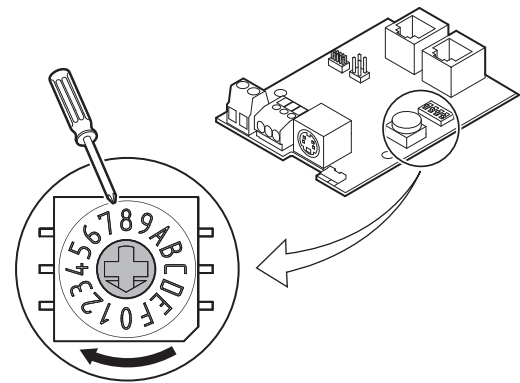


AD-3002623-02

- 1 A+ (GTW-251)
- 2 GND (GTW-251)
- 3 B- (GTW-251)
- 4 Rx/Tx- (heat pump)
- 5 GND (heat pump)
- 6 Rx/Tx+ (heat pump)
- 7 GTW-251
- 8 Heat pump

- Connect the Modbus cable with end sleeves to the gateway GTW-251 and the heat pump.

Fig.21 Rotary dial for identification number



AD-3002624-02

■ Setting the identification number at gateway GTW-251

The rotary dial can be used to select an identification number for the connected heat pump. If multiple heat pumps are connected, each heat pump has to be assigned a unique number for identification.

The letters on the rotary button represent the following numbers:

- A = 10
- B = 11
- C = 12
- D = 13
- E = 14
- F = 15

For the first heat pump of the cascade select the setting 1, for the second heat pump 2 and so on.

■ Modbus communication settings

- 1 S-bus
- 2 S-bus
- 3 Sliders for setting the baud rate and parity

Observe the following settings when connecting the CHVAC Main Controller via S-bus to gateway GTW-251:

Tab.7 Baud rate and parity

1-2	Baud	3-4	Parity
off-off	9600	off-off	None
on-off	19200	on-off	Odd
off-on	38400	off-on	Even
on-on	57600	on-on	None

■ Settings for Modbus communication

The baud rate has to be kept on the default value **9600** (1 = Off, 2 = Off). Set the parity to **none** (3 = Off, 4 = Off).

6.2.6 Connection of boilers

■ Connection of boilers with S-bus

Boilers with integrated S-bus connector can be connected directly to the CHVAC Main Controller via S-bus cabling.

■ Connection of boilers with L-bus



Important

- For communication between CHVAC Main Controller and boilers which are equipped with L-bus only, for each boiler an additional gateway (GTW-25) is required.
- The gateway GTW-25 will be integrated in the boiler itself.



See

Documentation of GTW-25



See

Respective documentation of the connected boilers

■ Connection of boilers with OpenTherm

Boilers which are equipped with neither an S-bus nor an L-bus port, can be connected via OpenTherm.



Important

For communication between CHVAC Main Controller and boilers via OpenTherm, for each boiler an additional gateway (GTW-40) is required.



See

Documentation of GTW-40



See

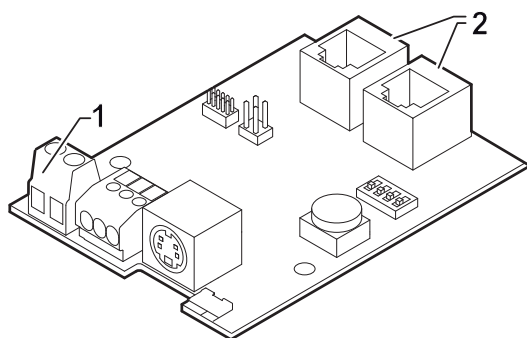
Respective documentation of the connected boilers

1. Connect the OpenTherm port of the boiler with the OpenTherm port of the GTW-40 interface.

- 1 OpenTherm
- 2 S-bus

2. Connect the S-Bus port of the gateway GTW-40 with the S-Bus port of the CHVAC Main Controller.

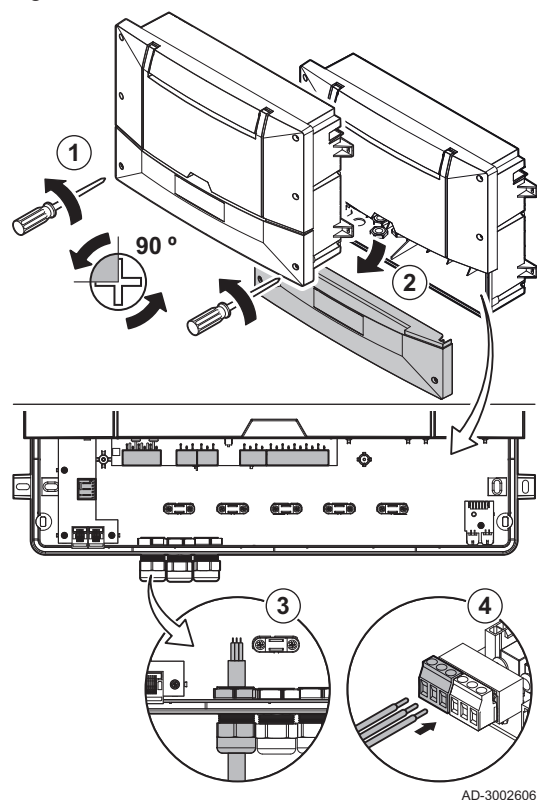
Fig.23 Connection ports at gateway GTW-40



AD-3002642-02

6.2.7 Access to the connectors

Fig.24 Access to the connectors

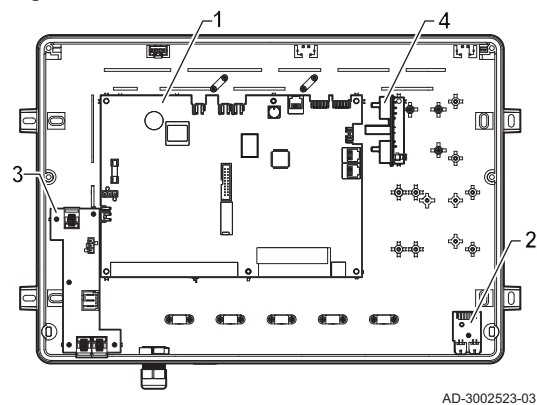


1. Unscrew the two screws by a quarter turn.
2. Remove the lower part of the front cover.
3. Guide the relevant connection cable(s) through the cable gland(s) on the bottom.
4. Connect the cables to the appropriate connectors.
5. Close the casing.

6.2.8 PCB locations

This illustration shows the location for each PCB.

Fig.25 PCB locations



- 1 IO-01
- 2 CB-20 (L-bus)
- 3 CB-05 (S-bus)
- 4 CLK-01



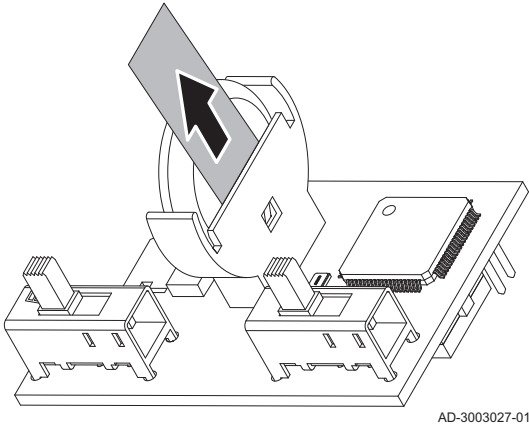
Important

The PCB of the control panel is integrated in the housing of the control panel.

6.2.9 Removing the plastic tab on PCB CLK-01

Open the CHVAC Main Controller's housing.

Fig.26 The plastic tab on CLK-01



AD-3003027-01

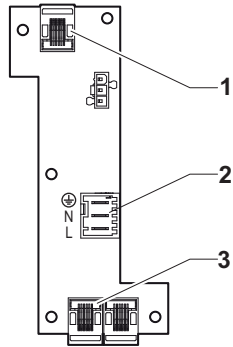
1. Pull the insulation tab in the direction of the arrow.



See also
Mounting additional PCBs in the controller, page 32

6.2.10 The PCB CB-05 and power supply

Fig.27 PCB CB-05

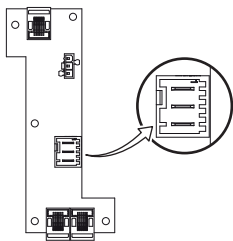


AD-3002537

- 1 Internal S-bus connection
- 2 Power supply
- 3 External S-bus connection


The PCB CB-05 provides easy access to the power and external S-bus connectors.

Fig.28  N L connector



AD-3002607

■ Connecting the power cable

The  N L connector is used to connect the 230 V power cable. Fuse the electrical supply line in accordance with all current local and national regulations and standards.



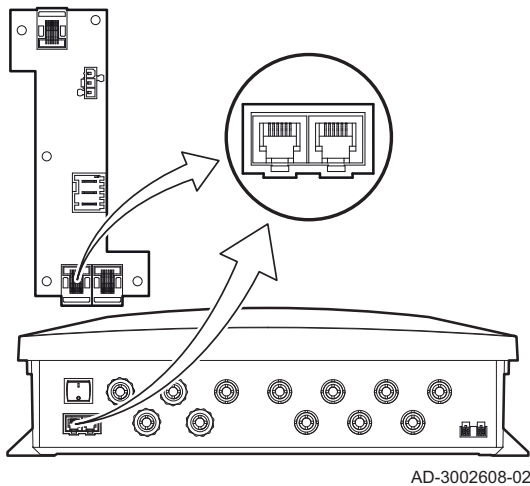
Danger of electric shock
Always turn off the main power before working on the electrical connections.

Make sure the following requirements are met when connecting the power cable:

Tab.8 Power connection

Wire cross section	Stripping length	Tightening torque
solid wire: 2.5 mm ² (AWG 14)	7 mm	0.5 N·m
stranded wire: 2.5 mm ² (AWG 14)		
stranded wire with ferrule: 2.5 mm ² (AWG 14)		

Fig.29 S-bus connector



■ S-bus connections

The external S-bus connector can be used to connect appliances (for example controllers, boiler cascades). An S-bus connection consists of cables and two bus terminators.

- A bus terminator is fitted on the S-bus in/out-connector on the first device.
- All devices are linked by use of an S-bus cable. The cable connects the S-bus out to the S-bus in of the next device.
- A bus terminator is fitted on the S-bus in/out-connector of the last device on the S-bus line.
- The location of the S-bus connector varies per device.
- The sequence of the connected devices can be adjusted as desired.
- The S-bus connection examples in this manual are possible sequences for S-bus connections and can vary based on configuration.

6.2.11 The PCB CB-20

Fig.30 PCB CB-20

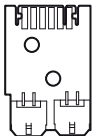
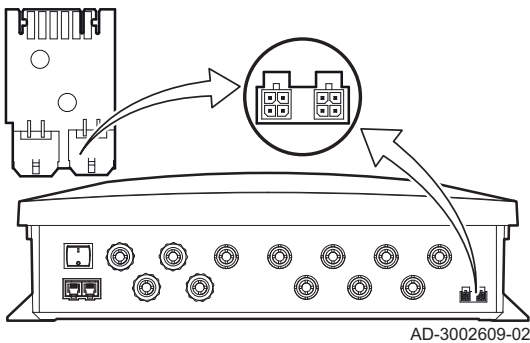


Fig.31 External L-bus connector

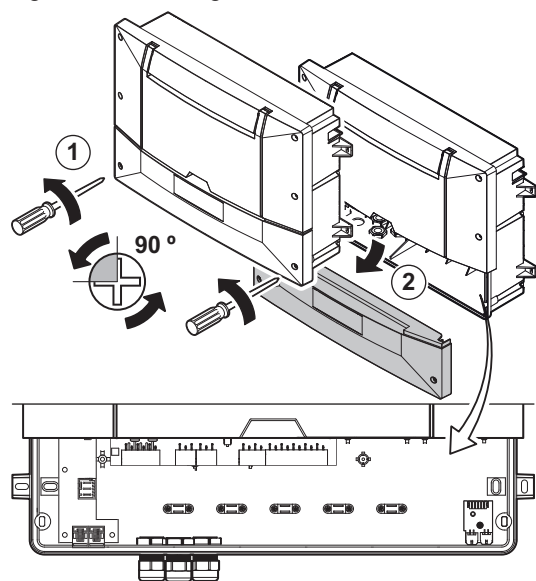


The PCB CB-20 provides easy access to the external L-bus connectors.

6.2.12 Remote connection/MK4

The Ethernet connection must be made at the Ethernet interface of the user interface of the controller.

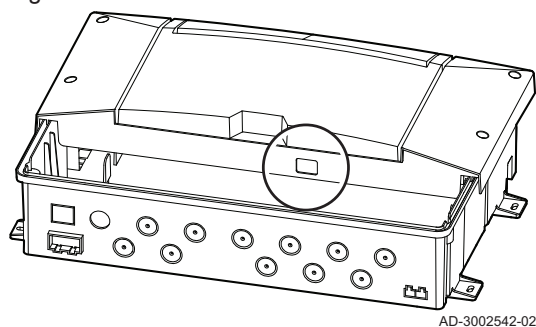
Fig.32 Removing the front cover



AD-3002541-02

1. Unscrew the two screws by a quarter turn.
2. Remove the lower part of the front cover.

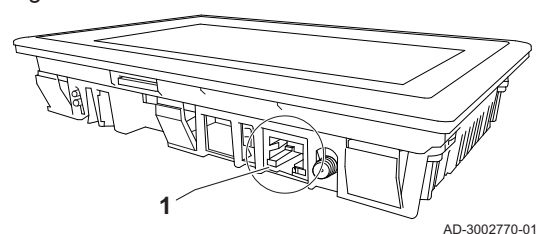
Fig.33 Hole for Ethernet cable



AD-3002542-02

3. Guide the Ethernet cable through the hole in the housing.
4. Connect the cable to the Ethernet interface on the backside of the user interface at connector 3.

Fig.34



AD-3002770-01

- 1 Ethernet interface

6.2.13 Connectors on the PCB IO-01

Due to the modular conception of the Controller System, several connectors can be multifunctional. The correct assignment depends on the hydronic set-up of the system.



See
Documentation SCB-10

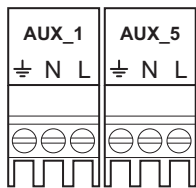


See also
Installation examples, page 37

■ Connecting a pump

Connecting a 230 VAC pump. The maximum power consumption is 300 VA.

Fig.35 Pump connector

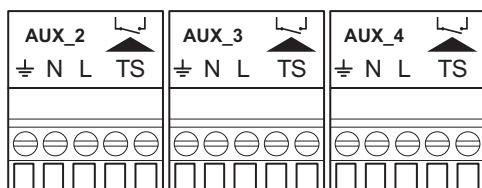


AD-3002543

Connect the pump as follows:

- ⏏ Earth
- N Neutral
- L Phase

Fig.36 Pump with temperature limiter connector



AD-3002595

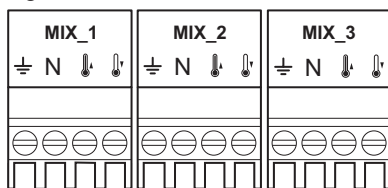
■ Connecting the pump with a temperature limiter

Connecting a pump (230 VAC) with a temperature limiter. The maximum pump power consumption is 300 VA.

Connect the pump and the temperature limiter as follows:

- ⏏ Earth
- N Neutral
- L Phase
- TS Protection thermostat (remove bridge)

Fig.37 Valve connectors



AD-3002596

■ Connecting a valve

Connecting a 3-way valve (230 VAC).

Connect the 3-way valve as follows:

- ⏏ Earth
- N Neutral
- ⏏ Open
- ⏏ Close

Fig.38 Outdoor temperature sensor

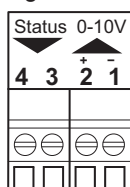


AD-4000006-04

■ Connecting an outdoor temperature sensor

An outdoor temperature sensor can be connected to the **Tout** terminal of the connector.

Fig.39 Input/output connector



AD-3002546

■ Connecting the status output or analogue input signal

Connect the input/output connector as follows:

- 1 & 2** 0–10 V / status input
- 3 & 4** status output (for example *alarm*)

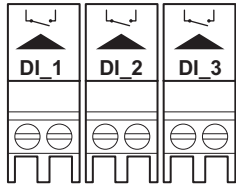
The input/output connector can be used to connect a remote control, a 0–10 V analogue input or as a status output.



Important

This functionality is not yet available.

Fig.40 Connectors for external control signals



AD-3002544

■ Connecting external control signals

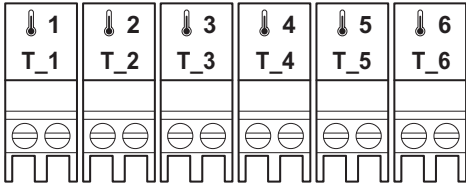
The PCB *IO-01* is fitted with three digital input connectors to connect external dry contacts for flexible use. The digital inputs have configurable functionalities.



Important

This functionality is not yet available.

Fig.41 Temperature sensor connectors



AD-3002545

■ Connecting temperature sensors

Connecting system sensors (VF60, NTC 10 kOhm/25 °C). The temperature sensor connectors have flexible use.



See also

Installation examples, page 37

Fig.42 Anode connector



AD-4000005-03

■ Connecting the DHW cylinder anode

Connecting a TAS anode (Titan Active System) for a DHW cylinder.

Connect the anode as follows:

- + Connection on the DHW cylinder
- Connection on the anode

**Caution**

If the DHW cylinder does not have a TAS anode, connect the simulation anode (= accessory).

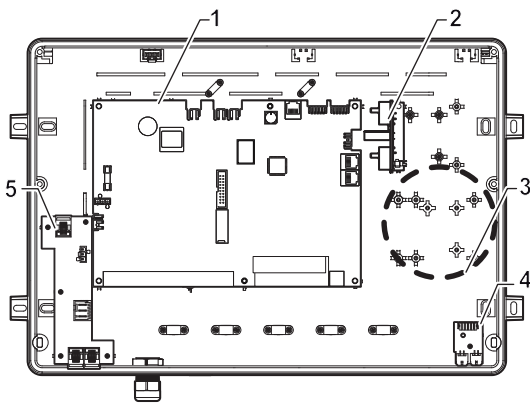
6.3 Mounting additional PCBs in the controller

**Danger****Work on live appliance**

Risk of death from electric shock!

- All electrical work must only be carried out by skilled electricians or skilled electricians for defined electrical work.
- Before commencing work on electrical equipment, you must disconnect the system from the power supply.
- Use a voltage tester to reliably determine that they are voltage-free.
- Secure the minute circuit breaker against being switched back on again.

Fig.43 Space for additional PCBs



AD-3002620-03

- 1 IO-01
- 2 CLK-01
- 3 Space for mounting an additional PCB
- 4 CB-20
- 5 CB-05

Within the housing of the CHVAC Main Controller space is available to mount one additional PCB.

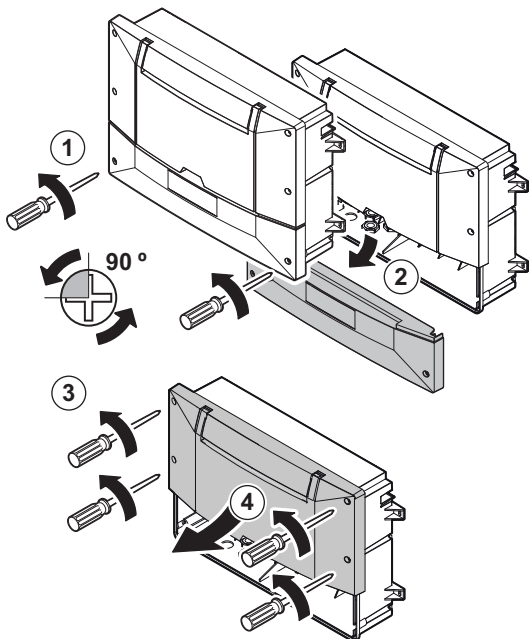
Typical applications are:

- GTW-08 Modbus: Modbus RTU connection of a Building Management System (BMS)
- GTW-21 BACnet: BACnet connection of a Building Management System (BMS)

1. Disconnect the system from the power supply.

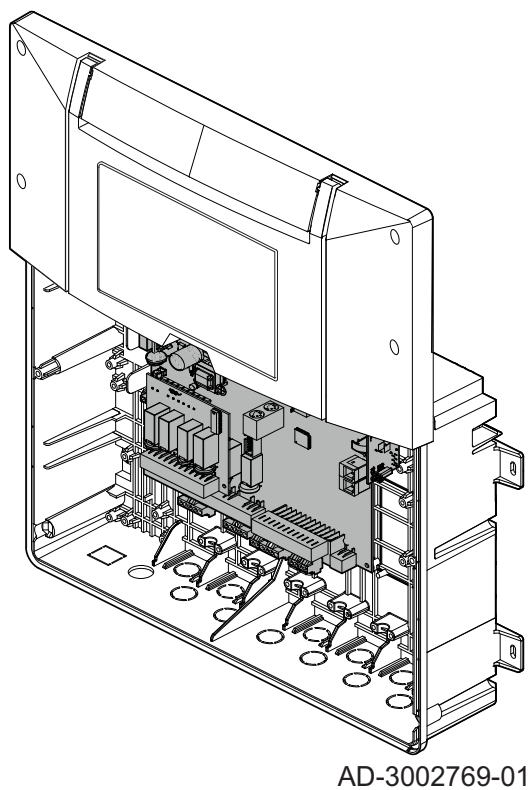
2. Open the housing.

Fig.44 Opening of the housing



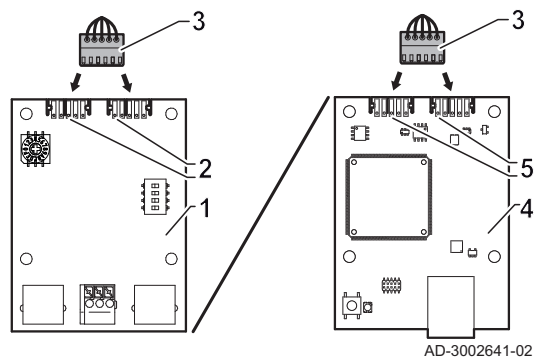
AD-3002640-02

Fig.45 Placing the top cover on the top of the base of the wall box.



3. Place the top cover on the top of the base of the wall box.
4. Mount the respective PCB with the supplied screws.
5. Connect the L-bus connector of the respective PCB to the L-bus plug of the internal wiring harness.

Fig.46 Connection of gateway GTW-08 Modbus Modbus RTU or GTW-21 BACnet

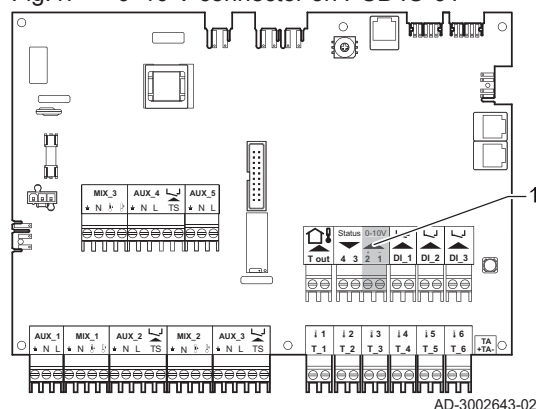


- 1 GTW-08 Modbus
- 2 L-bus connectors (both can be used)
- 3 L-bus plug of internal wiring harness
- 4 GTW-21 BACnet
- 5 L-bus connectors (both can be used)
6. Connect Modbus RTU or BACnet cable
7. Close the housing.
8. Set the required parameters according to the relevant gateway's documentation

6.4 How to connect BMS (Building Management System) control

6.4.1 BMS control via 0–10 V communication

Fig.47 0–10 V connector on PCB IO-01



1 0–10 V connector

**Important**

This functionality is not yet available.

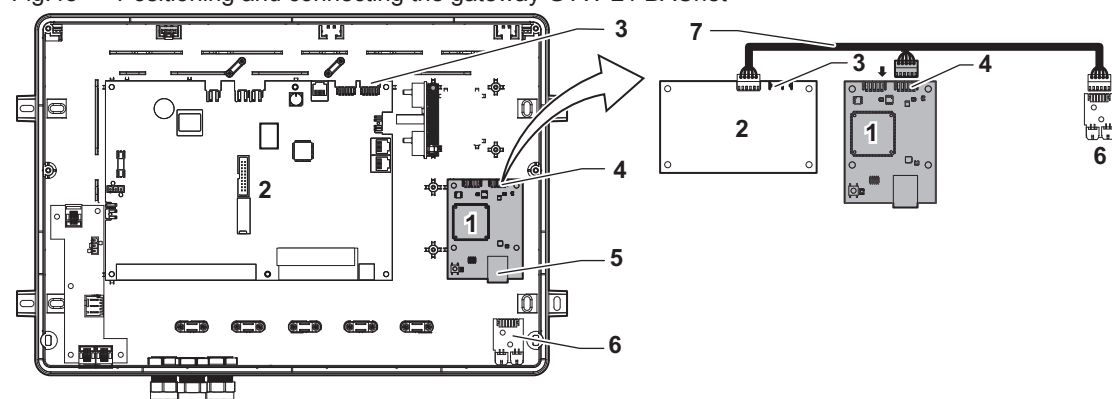
6.4.2 BMS control via BACnet communication

This installation requires the gateway GTW-21 BACnet accessory.

**See**

Documentation of gateway GTW-21

Fig.48 Positioning and connecting the gateway GTW-21 BACnet



AD-6000048-02

1 GTW-21 BACnet (to be placed and connected by the installer by use of the internal L-bus cable)

2 IO-01

3 L-bus connector on PCB IO-01

4 L-bus connector on gateway GTW-21 BACnet

5 BACnet connector

6 CB-20

7 Pre-fitted L-bus cable

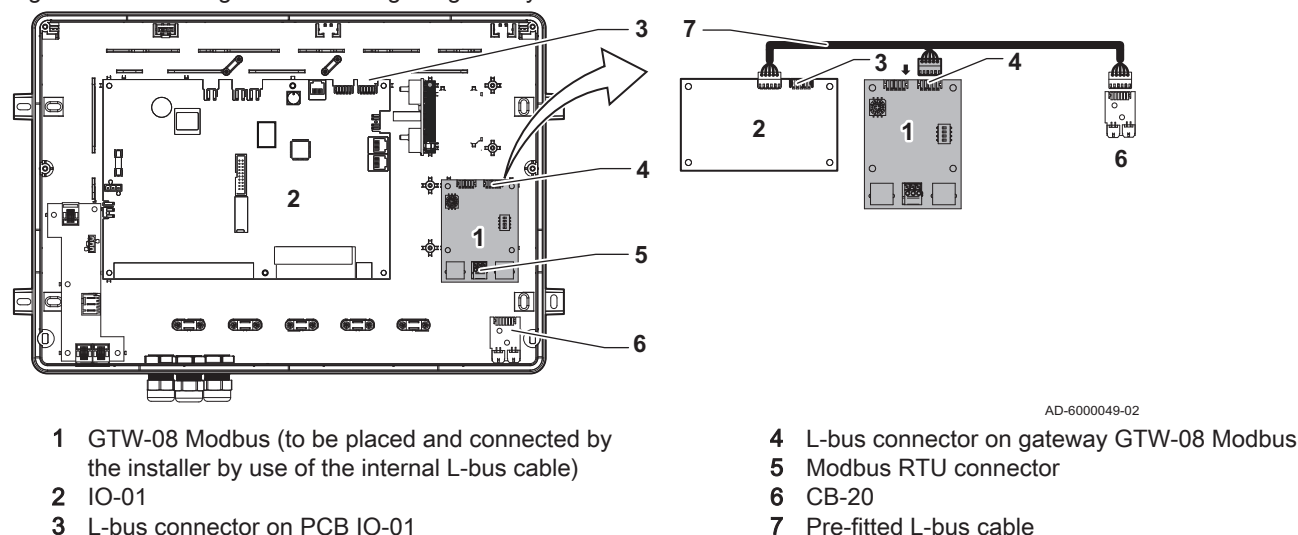
6.4.3 BMS control via Modbus RTU communication

This installation requires the gateway GTW-08 Modbus accessory.

**See**

Documentation of gateway GTW-08 Modbus

Fig.49 Positioning and connecting the gateway GTW-08 Modbus

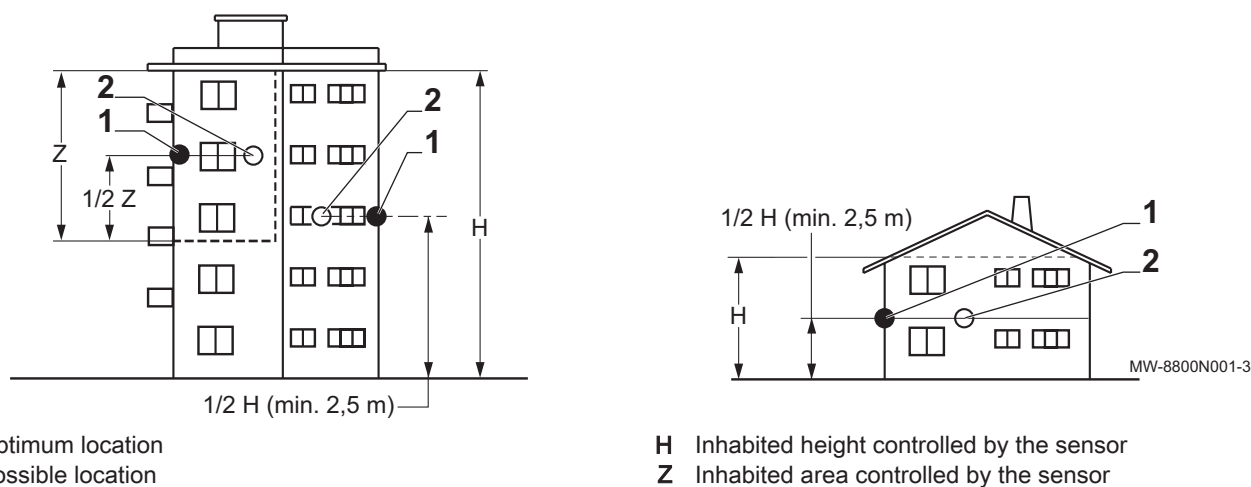


6.5 Mounting the outdoor temperature sensor

Place the outdoor temperature sensor in a position that covers the following characteristics:

- On a façade of the area to be heated, on the north if possible.
- Half way up the wall of the area to be heated.
- Under the influence of changes in the weather.
- Protected from direct sunlight.
- Easy to access.

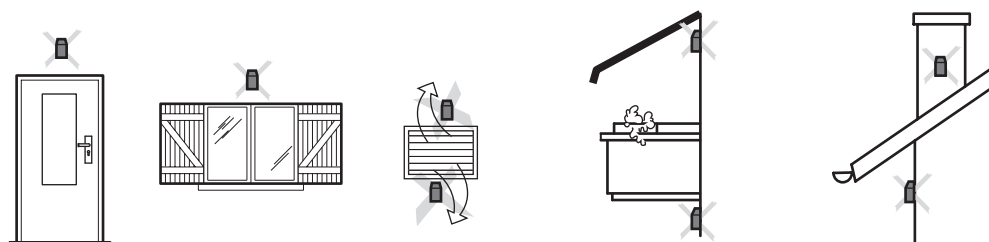
Fig.50 Advised positions



Avoid placing the outdoor temperature sensor in a position with the following characteristics:

- Masked by part of the building (balcony, roof, etc.).
- Close to a disruptive heat source (sun, chimney, ventilation grid, etc.).

Fig.51 Positions to be avoided



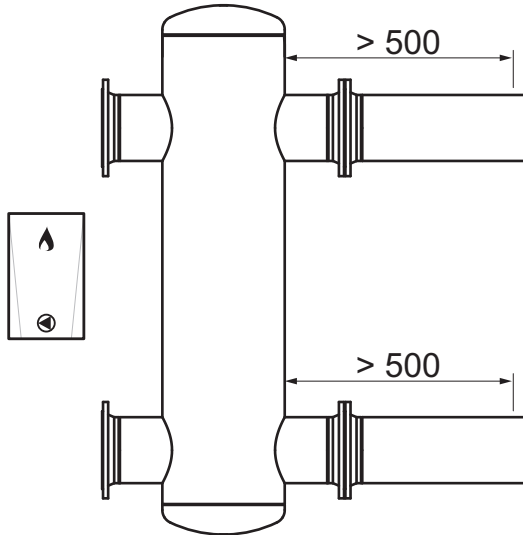
MW-3000014-2

Fig.52 Mount the outdoor temperature sensor

1. Drill two holes with a diameter of 6 mm.
2. Put the two plugs in place.
3. Secure the sensor using two screws.
4. Connect the cable to the outdoor temperature sensor.

6.6 Mounting temperature sensors around a low loss header

Fig.53 Positioning the temperature sensors



AD-3002333-02

1. Mount the temperature sensor on top of the pipe at the specified distance from the inlet or outlet.



Important

Add thermal paste between the pipe and the temperature sensor.



Only mounting the temperature sensor at the specified distance from the inlet or outlet enables correct temperature measurement. If the temperature sensor is too close to the inlet or outlet, there is a risk of incorrect measurement.

2. Mount the insulation for the low loss header.
3. Insulate the temperature sensors.



Insulating the temperature sensors enhances the accuracy of temperature measurements.

6.7 Temperature sensors on buffer tanks

To ensure the correct function of the buffer tank temperature sensors, certain rules must be observed.

The scope of delivery includes 4 sensors that are suitable in principle for use on the buffer tank:

- 2 × Contact temperature sensor (VF 60, NTC 10 kOhm)
- 2 × Immersion temperature sensor (KVT 60, NTC 10 kOhm)

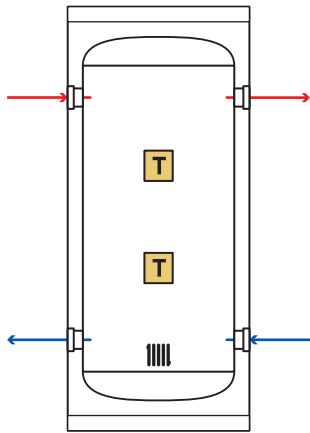
Immersion temperature sensors can be used if suitable mounts are available. If contact sensors are used, ensure full contact between the contact surface of the sensor and the buffer tank.

Regardless of the choice of sensors, the mounting position at the buffer tank depends on the hydronic system.

6.7.1 Buffer tank - 2 temperature sensors

i Important
2 temperature sensors have to be mounted at the buffer tank.

Fig.54 Position of the temperature sensors




AD-3002539-02

1. Mount the lower temperature sensor at the height or volume of about one third of the usable volume of the tank.
2. Mount the upper temperature sensor at the height or volume of about two thirds of the usable volume of the tank.

6.8 Installation examples

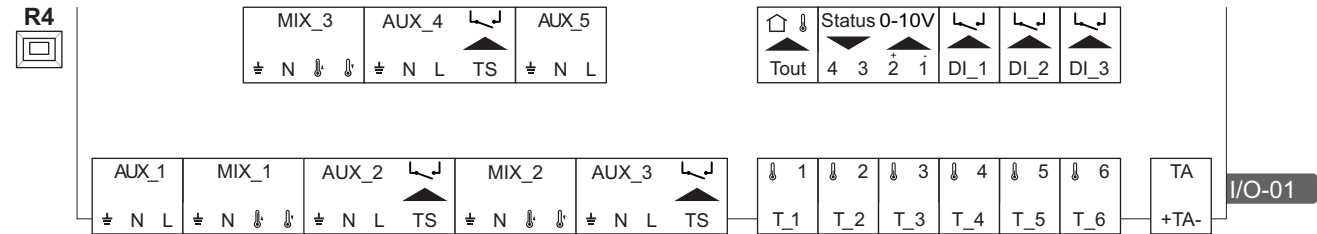
i Important
The hydronic schemes are only shown as functional basic circuit diagrams. Hydronic and safety equipment must be designed and installed in accordance with national regulations.

 Hydronic schemes always show 3 boilers, 3 heat pumps and 3 mixing zones. The number of these components and the type of the heating circuit is variable.

i Important
Install a non-return valve for each producer in the cascade, when installing a cascade of boilers (more than one) and/or a cascade of heat pumps (more than one).

6.8.1 Connectors on the IO-01

Fig.55 Diagram and components

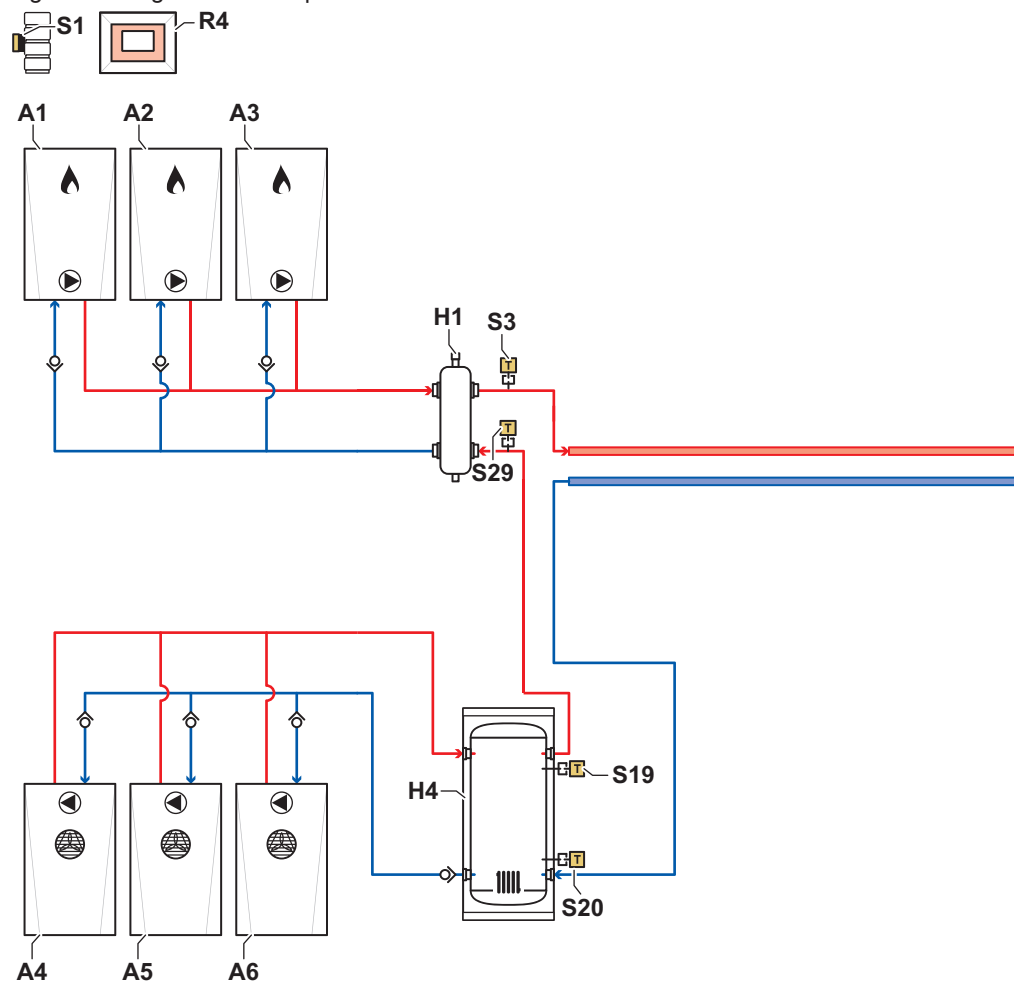


AD-6000052-01

- | | |
|--|--|
| AUX_1 Relay output 230 V | T_2 Temperature sensor input |
| MIX_1 Mixing valve output 2x 230 V - Not used | T_3 Temperature sensor input |
| TS Safety thermostat - Not used | T_4 Temperature sensor input |
| T_1 Temperature sensor input | Tout Outdoor temperature sensor input |

6.8.2 Cascade controlled by internal zone

Fig.56 Diagram and components

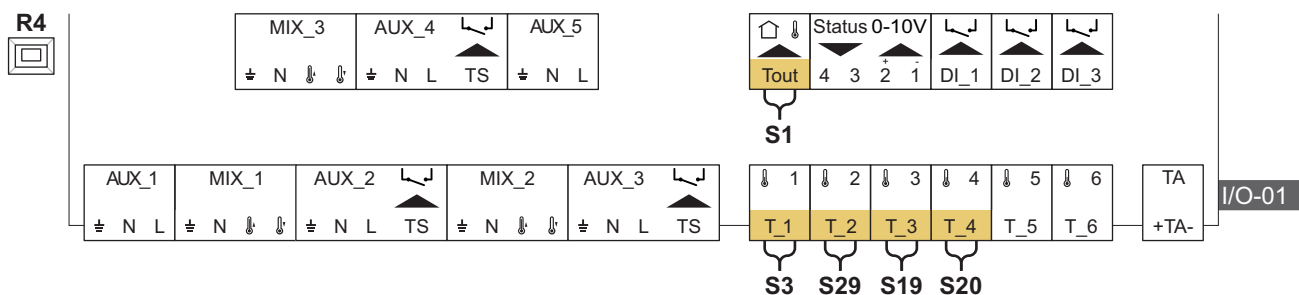


AD-6000047-01

A1 Boiler
A2 Boiler
A3 Boiler
A4 Heat pump
A5 Heat pump
A6 Heat pump
H1 Low loss header

H4 Heating buffer tank
S1 Outdoor temperature sensor
S3 Low loss header flow temperature sensor
S19 Heating buffer tank top temperature sensor
S20 Heating buffer tank bottom temperature sensor
S29 Low loss header return temperature sensor
R4 CHVAC Main Controller

■ Electrical connections



AD-6000031-01

■ Parameter settings on CHVAC Main Controller R4



Important

Contact your local service organisation for information about relevant parameter settings.

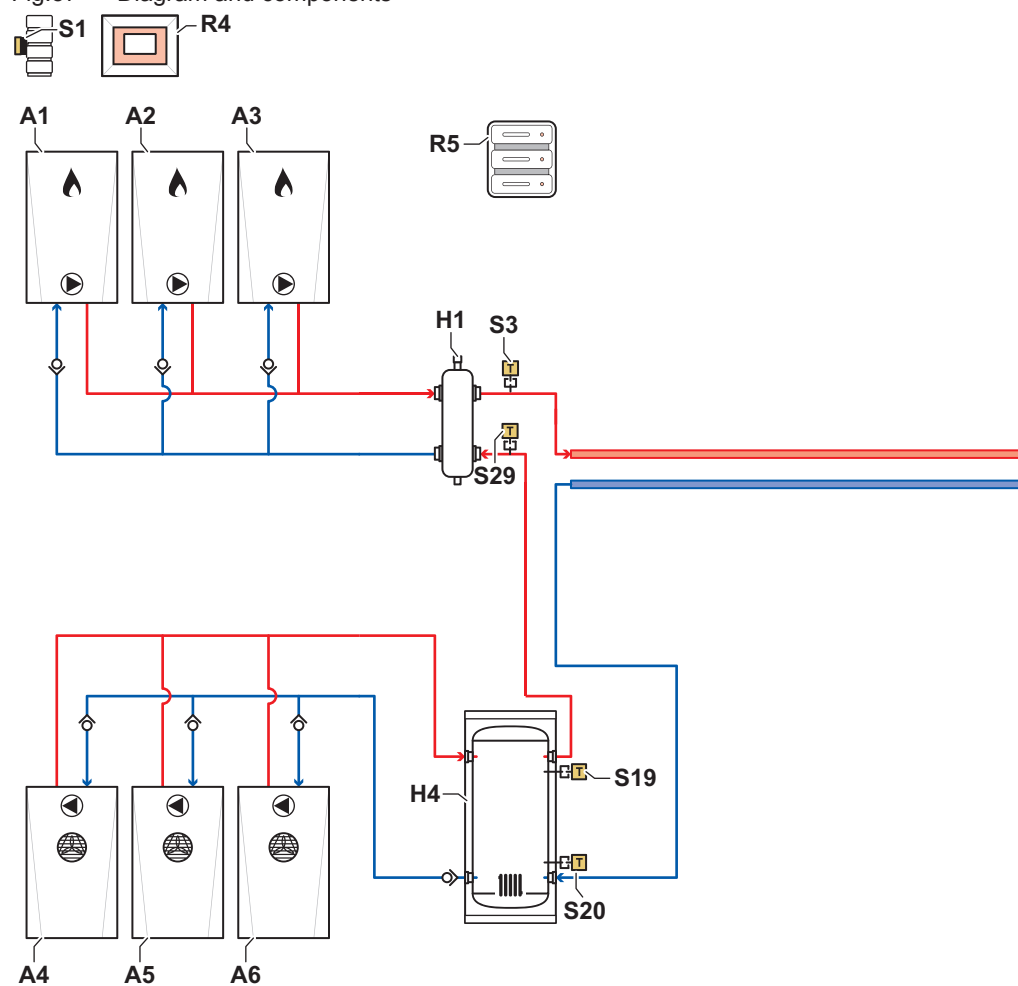


Important

Set all zone parameters as required

6.8.3 Cascade controlled by an external BMS

Fig.57 Diagram and components

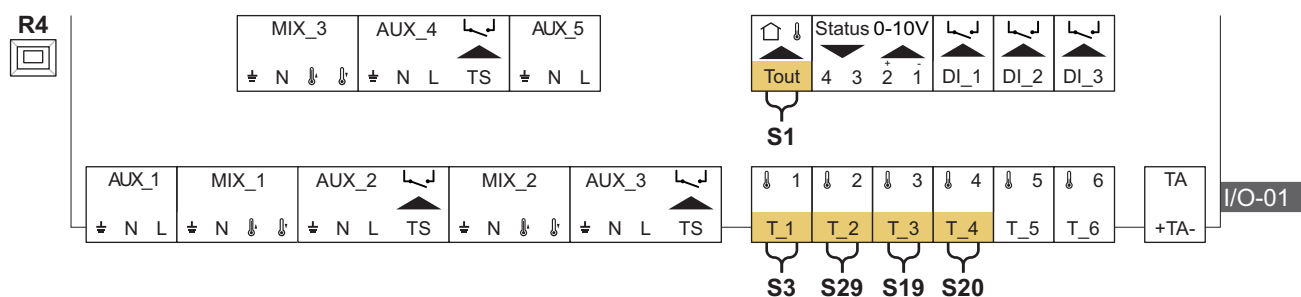


AD-6000051-01

- A1** Boiler
A2 Boiler
A3 Boiler
A4 Heat pump
A5 Heat pump
A6 Heat pump
H1 Low loss header
H4 Heating buffer tank

- S1** Outdoor temperature sensor
S3 Low loss header flow temperature sensor
S19 Heating buffer tank top temperature sensor
S20 Heating buffer tank bottom temperature sensor
S29 Low loss header return temperature sensor
R5 BMS (Building Management System)
R4 CHVAC Main Controller

■ Electrical connections



AD-6000031-01

■ Parameter settings on CHVAC Main Controller R4

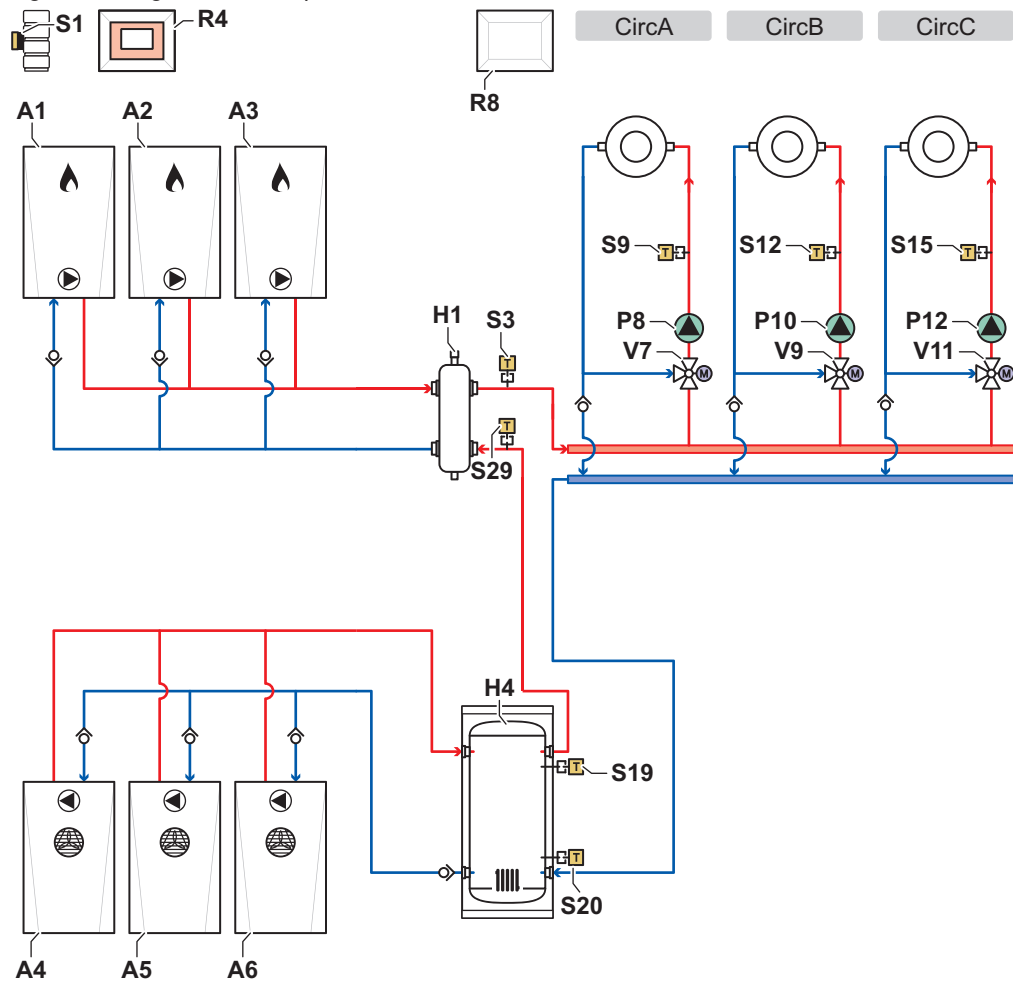


Important

Contact your local service organisation for information about relevant parameter settings.

6.8.4 Cascading using zone support

Fig.58 Diagram and components



AD-6000030-01

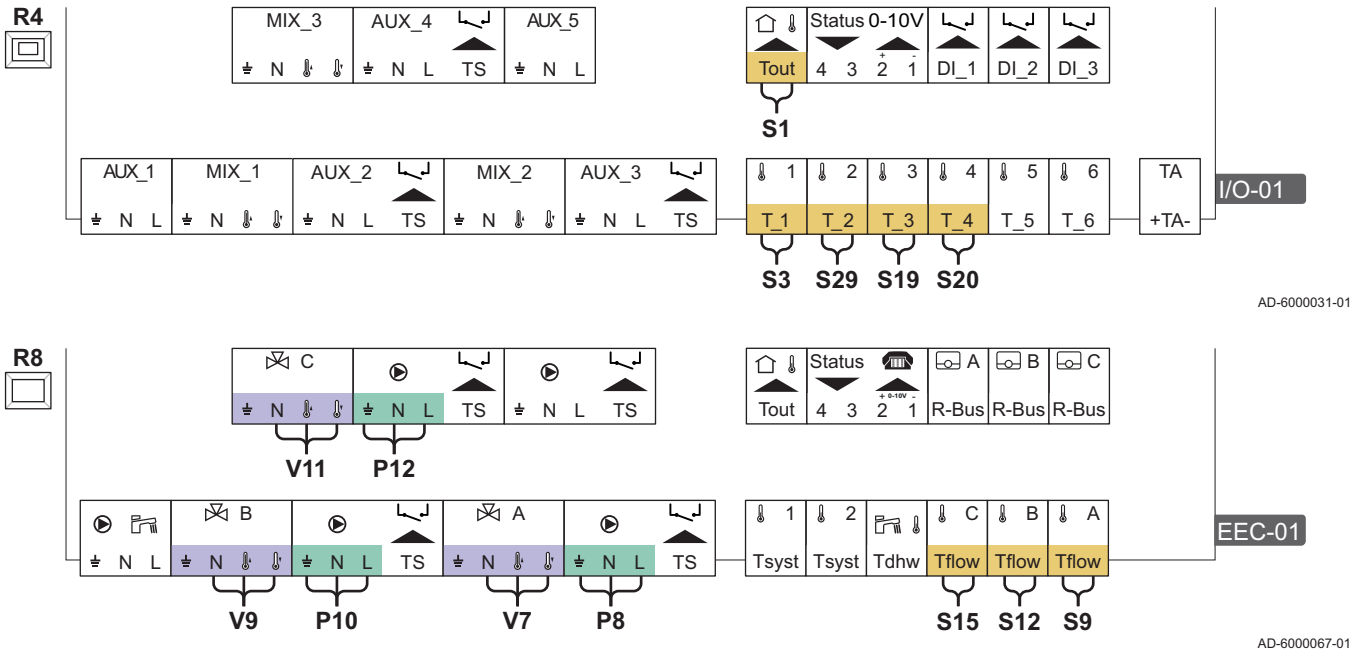
- A1** Boiler
- A2** Boiler
- A3** Boiler
- A4** Heat pump
- A5** Heat pump
- A6** Heat pump
- P8** Pump
- P10** Pump
- P12** Pump
- V7** Mixing valve
- V9** Mixing valve
- V11** Mixing valve
- H1** Low loss header

- H4** Heating buffer tank
- S1** Outdoor temperature sensor
- S3** Low loss header flow temperature sensor
- S9** Flow temperature sensor
- S12** Flow temperature sensor
- S15** Flow temperature sensor
- S19** Heating buffer tank top temperature sensor
- S20** Heating buffer tank bottom return temperature sensor
- S29** Low loss header return temperature sensor
- R4** CHVAC Main Controller
- R8** Zone controller

Required zone components have to be connected at R8 Zone controller:

- Pumps for heating circuits P8, P10, P12
- Three-way mixing valves V7, V9, V11
- Flow temperature sensors after mixing valves S9, S12, S15

■ Electrical connections



■ Parameter settings on CHVAC Main Controller R4



Important
Contact your local service organisation for information about relevant parameter settings.

■ Parameter settings on zone controller R8



See
Zone controller documentation for information regarding parameter settings on R8.

7 Operation

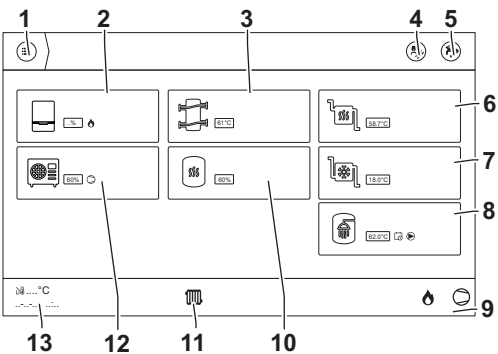
7.1 General

The touch display of the controller is used to operate the appliance as well as to view and enter the system parameters.

7.2 Using the user interface

7.2.1 Dashboard

Fig.59 Dashboard



AD-3002375-02

- 1 Menu*
- 2 Boiler cascade*
- 3 Low loss header*
- 4 Maintenance*
- 5 Service level access*
- 6 Heating circuit*
- 7 Cooling circuit*
- 8 DHW tank*
- 9 Heat demand
- 10 Heating buffer*
- 11 Heat demand
- 12 Heat pump cascade*
- 13 Outdoor temperature*

NOTE: Display areas marked with * are linked to the corresponding menu. For example, clicking on the *Buffer tank* area will open the menu of the buffer tank settings.

Operating elements:

- [Menu]: Switch to menu view
- Top right: [Installer]: Switch to password entry for the *service level*
inactive: black, active: white

Status bar (bottom right):

- Installer level active
- Maintenance pending
- Error active

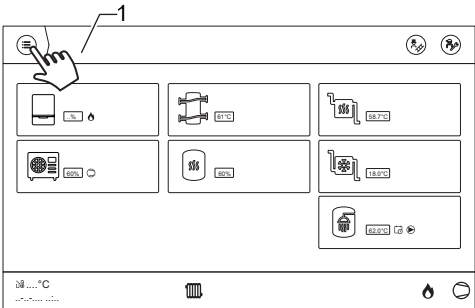
7.2.2 Descriptions of the icons in the display

Tab.9 Icons

Icon	Description
[Menu]	Main menu: selecting this icon opens the main menu from any other active menu.
[Installer]	Installer menu: installer-level parameters can be configured.
[i]	Additional information: description and Symbol ID.
[Gear]	System settings: system parameters can be configured.
[X]	Error indicator.
[Outdoor sensor]	The outdoor temperature sensor is connected: select this icon to switch to the associated menu.
[Buffer tank]	Buffer tank is connected: select this icon to switch to the associated menu (heating water circuits).
[Frost protection]	Frost protection is enabled: Protect the boiler and installation from freezing in winter.
[Sun]	Seasonal mode: summer mode enabled.
[Snowflake]	Seasonal mode: winter mode enabled.
[Heat pump]	At least one heat pump unit enabled.
[Flame]	At least one burner of the boiler cascade is switched on.
[Snowflake]	Cooling mode enabled.

7.2.3 Control elements - calling up the menu view

Fig.60 Opening the menu view



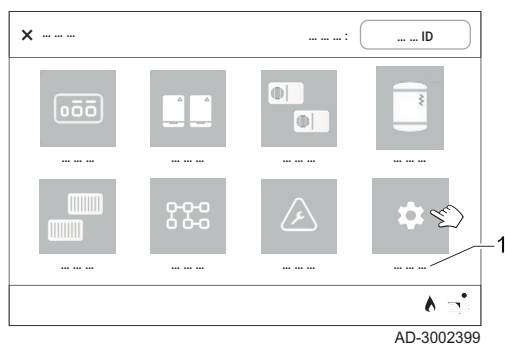
AD-3002398-02

1. Switch from the **operating view** to the **menu view** using [Menu].
1 Dashboard
⇒ The **menu view** opens.

7.2.4 Control elements - calling up a sub-menu from the menu view

1. Switch to a sub-menu by selecting a [sub-menu symbol].

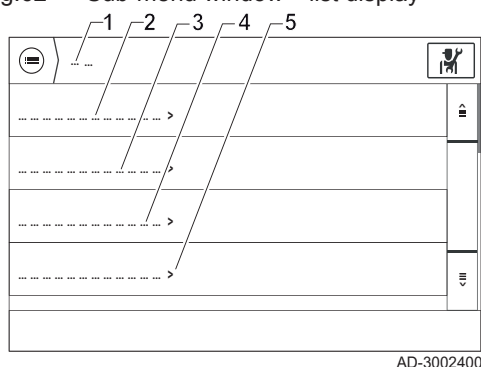
Fig.61 Selecting a sub-menu



1 Sub-menu (here: **Settings**)

⇒ The **sub-menu** window opens as a list.

Fig.62 Sub-menu window – list display



1 Selected menu (here: **Settings**).

2 Sub-menu (here **Date and time**)

3 Sub-menu (here **Language and keyboard**)

4 Sub-menu (here **Screen settings**)

5 Sub-menu (here **Communication**)

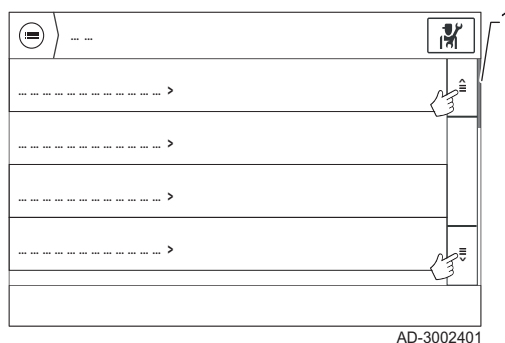
The [>] symbol indicates that sub-menus are available.

The menus and parameters that are currently selected are displayed in the header (here: **Settings**).

2. Scroll within a sub-menu using [UP] ⬆ and [Down] ⬇.

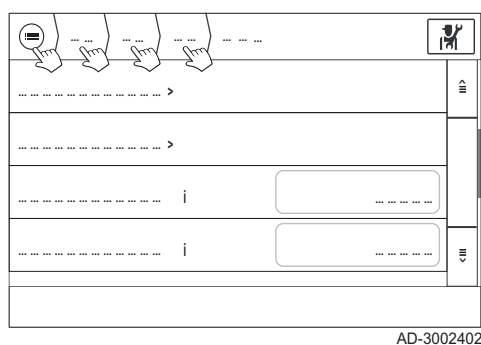
⇒ The position within the menu is indicated by the **[scroll bar]**.

Fig.63 Scrolling



1 Scroll bar

Fig.64 Switch to a higher-level menu

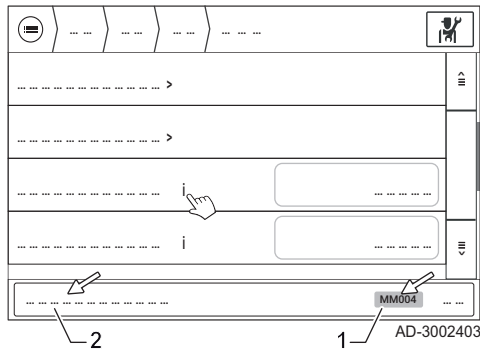


3. Switch to any displayed **higher-level** menus by selecting the respective menu in the header.

4. Return to the **menu view** using ⬅.

5. Access additional information about the parameters by selecting [I]:
 - Description of the parameter
 - Five-digit identification number **Symbol ID** (for example MM004)

Fig.65 Additional information



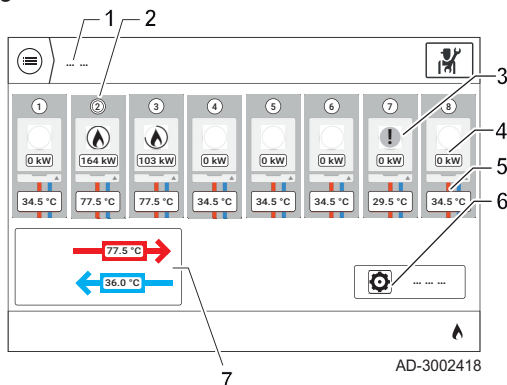
- 1 **Symbol ID** (here MM004)
- 2 Additional information about the selected parameter

7.2.5 Special case - the sub-menus of producer cascades

The sub-menus of the producer cascades (boiler cascade or heat pump cascade) differ from those of the other sub-menus which can be accessed via the menu view.

By selecting one of those sub-menus a graphical interface opens. It provides technical information on the current function of the individual producer units within the respective cascade. By selecting one of the displayed producer units a sub-menu opens to parametrise the respective unit.

Fig.66 Sub-menu Boiler cascade



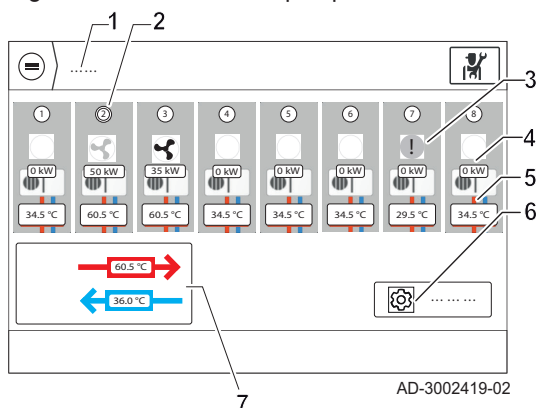
- 1 Menu: Boiler cascade
- 2 Unit number (symbol for selection)



The numbering of the cascade units can be adjusted by the installer. Mark the producers with the corresponding number to clarify assignment between appliance and its representation in the control.

- 3 Status symbol
- 4 Current output
- 5 Current flow temperature
- 6 Button settings
- 7 Current flow and return temperatures of the producer cascade

Fig.67 Sub-menu heat pump cascade



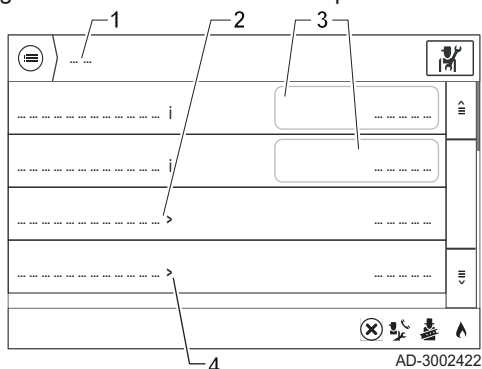
- 1 Menu: Heat pump cascade
- 2 Unit number (symbol for selection)



The numbering of the cascade units can be adjusted by the installer. Mark the producers with the corresponding number to clarify assignment between appliance and its representation in the control.

- 3 Status symbol
- 4 Current output
- 5 Current flow temperature
- 6 Button settings
- 7 Current flow and return temperatures of the producer cascade

Fig.68 Menu to edit boiler unit parameters



1. Select **[Settings]** to switch to the sub-menu **Boiler cascade > Settings**
⇒ A sub-menu opens, which allows you to change the parameters of the selected boiler unit.

- 1 Menu: **Boiler cascade**
- 2 Menu: **Settings**
- 3 Modifiable parameters
- 4 Link to further sub-menu

7.2.6 Control elements - using the search function (Symbol ID)

The **menu view** contains a search function which can be used to search for the **Symbol ID** (identification number) of individual parameters.

This **Symbol ID** is of vital importance for operating the controller and using the user manuals. The latter of which describe the settings at the controller.

You can easily find information about each parameter in the user manuals using **Symbol ID**. The **Symbol ID** is indicated by selecting **[i]** in the parameter list.

- 💡 The user manuals are structured such that many **Symbol ID** codes are listed in the table of contents.

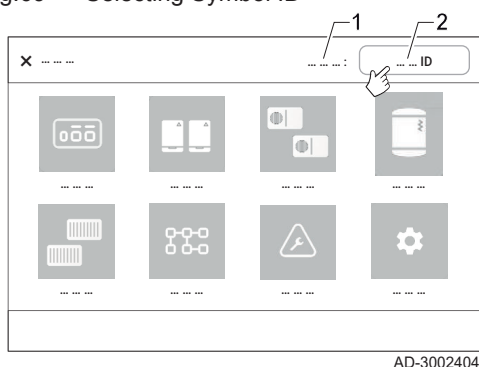
The process for selecting each setting parameter directly from the **menu view** by entering the **Symbol ID** is described below.

1. Select the **Symbol ID** field.

- 1 Search:
- 2 Symbol ID

⇒ A window containing a numeric keypad for entering the **Symbol ID** opens.

Fig.69 Selecting Symbol ID



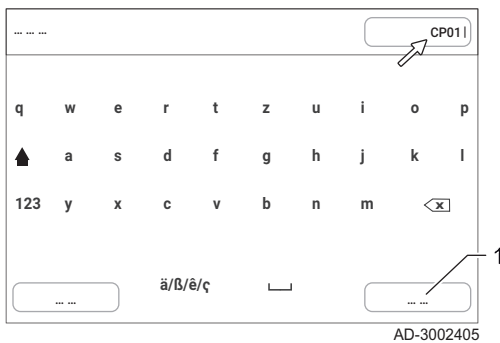
2. Enter the Symbol ID (here cp01) using the numeric keypad.



Important

- You can search for a unique **Symbol ID** (five-digit, for example cp010) or a group of parameters by entering only the first few digits of the **Symbol ID** (for example cp0).
- If only part of the **Symbol ID** is entered (see example), the software searches for all parameters starting with the number entered (for example cp010, cp011, cp012, cp020).
- The results are limited to 20 parameters. If this number is exceeded, a corresponding message will appear and only the first 20 results will be shown (see below).
- The results are sorted alphanumerically.

Fig.70 Entering the Symbol ID



1 [Search]

3. Confirm the entry by pressing **[Search]**.

⇒ The search starts and the results are displayed in the window **Search results**.

■ Introduction to parameter codes

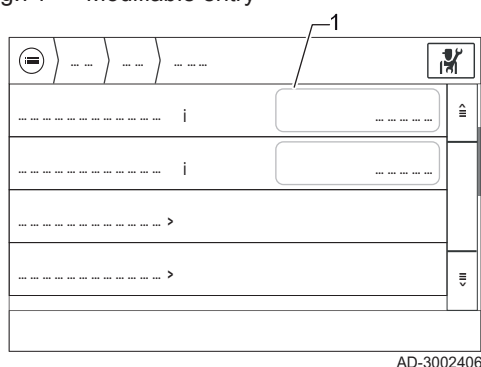
The controls platform makes use of an advanced system to categorise parameters, measurements and counters. Knowing the logic behind these codes makes it easier to identify them. The code consists of two letters and three numbers, for example **CP010**.

- The first letter is the category the code relates to: **CP010**
 - A: Communication and appliance
 - B: Buffer tank
 - C: Zone
 - D: Domestic hot water (DHW)
 - E: Smart solution
 - G: Gas fired engines
 - H: Heat pumps
 - N: Energy management
 - O: Oil fired heat engines
 - P: Central heating
 - S: Solar and PV
- The second letter is the type: **CP010**
 - P: Parameter
 - C: Counter
 - M: Measurement (signals)
- The number always consists of three digits, the last of which may, if applicable, refer to a zone: **CP010**

7.2.7 Control elements - modifiable menu entries

Modifiable menu entries are indicated by a frame.

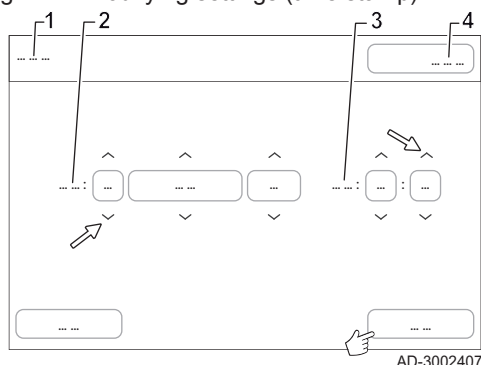
Fig.71 Modifiable entry



1 Frame indicating modifiable entry

1. Select the framed field for modification.
⇒ A pop-up window opens in which the settings can be implemented.
Different options are available, as e.g. time stamp, selections from a list or textual input.
2. Modify the settings (here time stamp)

Fig.72 Modifying settings (time stamp)



1 Parameter to be edited (here Date and time)

2 Date:

3 Time:

4 Current value of the entry to edit

5 [Save]

2.1. Modify settings using [↑] and [↓] (1).

2.2. Confirm the settings by pressing [Save] (2).

7.2.8 Term definitions

■ Zone

The software for the control unit enables several **zones** (hydraulic circuits) to be controlled independently of each other. These zones may signify both heating circuits and, for example, a domestic hot water circuit or other hydraulic circuits, such as the charging of a domestic hot water storage tank on-site.

In the factory, the individual zones were designated with **CIRCA**, **CIRCB**, et cetera. This internal short designation is displayed in the menu **Zones > Zone (for example CIRCA) > Friendly Name of the user zone short** and cannot be changed.

In the menu **Zones > Zone (for example CIRCA) > Friendly Name of the user zone**, each zone can be given a user-defined name (for example Heating circuit 1). These names are applied to the **Zones** menu.

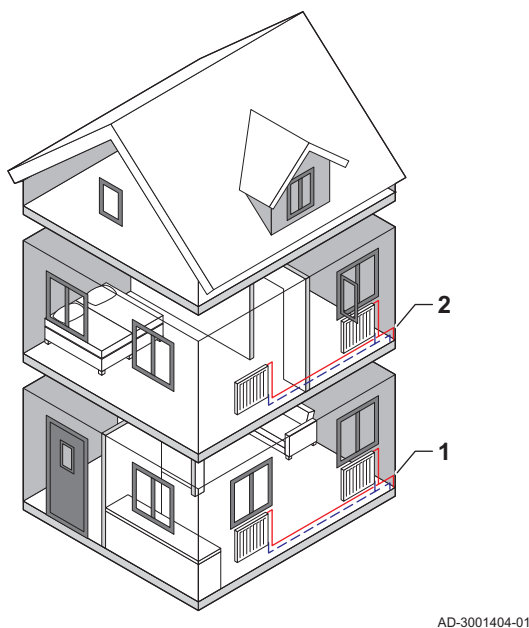


Important

Even if the zones are named according to their function (for example Heating circuit 1, Domestic hot water circuit, Swimming pool), the setting parameters in the sub-menus occasionally contain the prefixed term **heating circuit** or the corresponding abbreviation **HC**.

These designations are **not** based on the function (heating circuit) of the relevant parameter but are solely based on the modular structure of the software. This ensures that settings, parametrisation and names are always configured in the same way, regardless of the type of zone.

Fig.73 Two zones



■ Definition of zone

Zone is the term given to the different hydraulic circuits CIRCA, CIRCB and so on. It designates several areas of a building served by the same circuit.

Multiple zones are only possible with an expansion PCB.

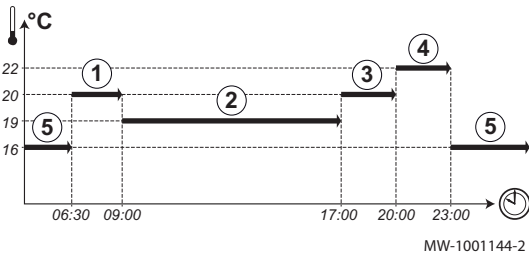
Tab.10 Example of two zones

	Zone	Factory name
1	Zone 1	CIRCA
2	Zone 2	CIRCB

■ Activity

The term "activity" is used when programming time intervals. It refers to the temperature level (temperature specification) for different activities (time intervals) throughout the day. One setpoint temperature is linked to each activity. The last activity of the day remains valid until it will be replaced by the first activity of the following day.

Fig.74 Activities in a time program



Tab.11 Activities in a time program (example)

Beginning of the activity	Activity	Temperature setpoint
6:30	① Morning	20 °C
9:00	② Away	19 °C
17:00	③ Home	20 °C
20:00	④ Evening	22 °C
23:00	⑤ Sleep	16 °C

7.2.9 Setting terms

User-friendly designations can be adjusted for activities and zones. Activities (**Set activity names**) and zones (**Friendly Name of the user zone**) can be adjusted in the **Zones menu**. The procedure is shown as an example here.

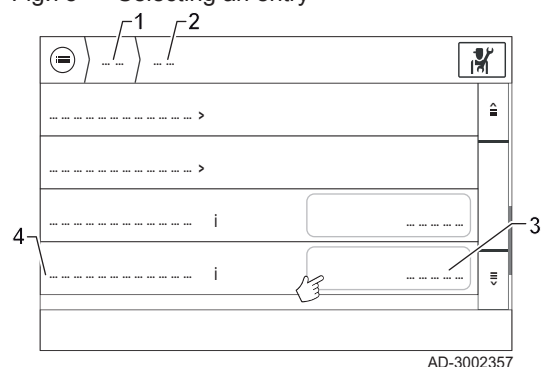
1. Select the parameter **Friendly Name of the user zone**.



Important

Only entries with a corresponding button (grey frame) can be edited.

Fig.75 Selecting an entry



- 1 Menu: Zones
 - 2 Menu: *zone* (for example CIRCA)
 - 3 Current setting for parameter Friendly Name of the user zone (here CIRCA)
 - 4 Parameter: Friendly Name of the user zone
- ⇒ A pop-up window with a keyboard opens.

Fig.76 Pop-up window



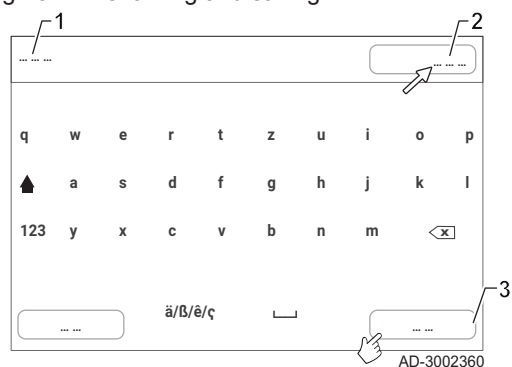
- 1 Parameter: Friendly Name of the user zone
 - 2 Current setting for parameter Friendly Name of the user zone (here CIRCA)
2. Remove the existing entry using <x>.

Fig.77 Deleting an entry



- 1 Parameter: Friendly Name of the user zone
 - 2 Current setting for parameter Friendly Name of the user zone while editing
3. Enter the new designation using the keyboard.

Fig.78 Renaming and saving



- 1 Parameter: Friendly Name of the user zone
 - 2 Changed setting for parameter (for example *Appartement 1*)
 - 3 Done
- A maximum of 20 characters is possible.
 - Switch between upper case and lower case using ▲
 - Switch to numeric input and back again using 123.
 - Switch to special characters and back again using ä/ß/ë/ç.
4. Confirm the entry by pressing **[Done]**.
- ⇒ The entry has been renamed and the display switches to the higher-level menu.

7.2.10 Parametrising Schedule

►► Zones > *Zone* (for example CIRCA) > Zone mode > Schedule

Heat provision can be set for all zones (heating circuits, domestic hot water generation) using the **Zone mode > Schedule** menu. The settings are identical in all zones.

The adjustment to a time program for a heating circuit is shown as an example here.

Framework conditions:

- The option *Time program* must be selected in the **Operating mode of the zone** (CP32x) parameter for the selected zone (for example heating circuit).
- Up to six switching times can be assigned per day. This corresponds to a maximum of six time intervals with assigned activity.
- **Six activities** are available for **heating circuits**:
 - Morning
 - Away
 - Home
 - Evening
 - Sleep
 - Custom

The designations in English are factory settings and can be customised under **Zones > Set activity names**

- **Two activities** are available for **domestic hot water generation**:
 - Comfort
 - Reduced
- The last activity of the day remains valid until the first activity of the following day.
- A maximum of nine characters are available for renaming activities.

Up to three different **time programs** can be created and saved.

The time program that is to be set is selected in the menu **Zone selected time prog** for each zone.

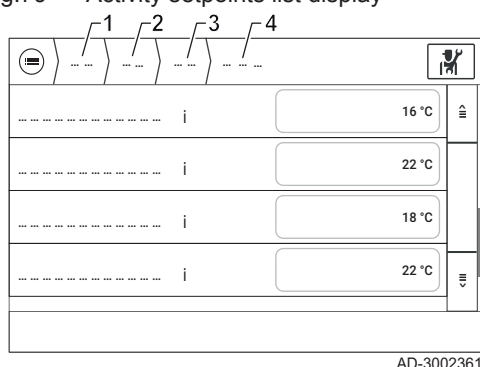
Available time programs:

Designation	Factory setting
Schedule 1 ⁽¹⁾	Monday–Sunday: 06:00–22:00
Schedule 2	Monday–Friday: 05:00–08:00/16:00–23:00 Saturday/Sunday: 07:00–23:00
Schedule 3	Monday–Friday: 06:00–08:00/11:00–13:30/16:00–22:00 Saturday/Sunday: 06:00–23:00
(1) Activated at the factory	

■ Adjusting the Schedule

1. Make sure you know the designation of the zone that you want to parametrise (for example CIRCA as in the given example)
2. Allocate **setpoint temperatures** to the activities if the basic settings are to be changed.

Fig.79 Activity setpoints list display



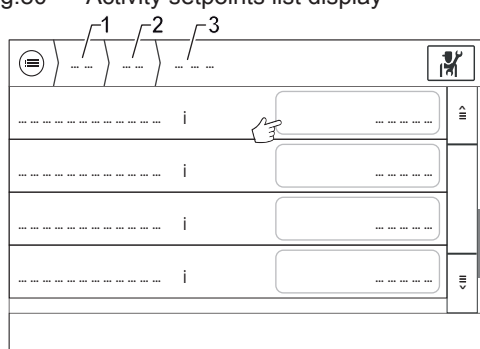
AD-3002361

2.1. Select the **Zones > CIRCA > Zone mode > Activity setpoints** menu.

- 1 Menu: Zones
- 2 Menu: *zone* (for example CIRCA)
- 3 Menu: Zone mode
- 4 Parameter: Activity setpoints

⇒ A list display showing the temperatures and their allocated activities opens.

Fig.80 Activity setpoints list display



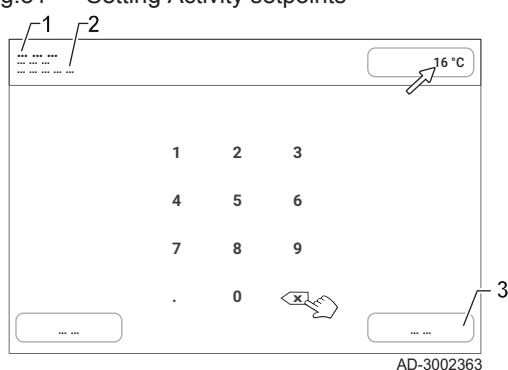
AD-3002362

2.2. Select the temperature that you want to change.

- 1 Menu: Zones
- 2 Menu: *zone* (for example CIRCA)
- 3 Parameter: Activity setpoints

⇒ A pop-up window with a numeric keypad opens.

Fig.81 Setting Activity setpoints



AD-3002363

2.3. Delete the entry using **<X>**, enter a new temperature value using the numerical keypad and confirm the entry by pressing **[Done]**.

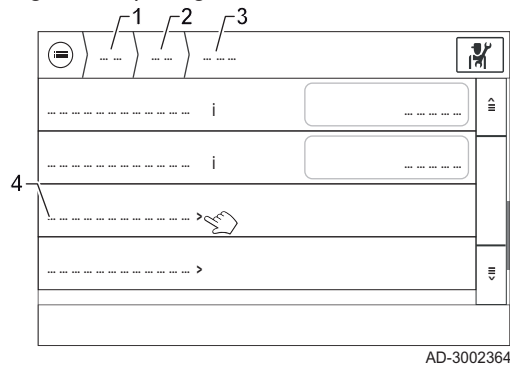
- 1 Parameter: User Room Setpoint Zone Activity temp (CP080)
- 2 Setting range for selected parameter
- 3 Done

2.4. If required, carry out this procedure for other activities.

⇒ Now the target temperatures are assigned to the respective activities. In the next step those activities are combined to give a daily/weekly temperature profile for the respective zone.

3. In the parameter **Zone selected time prog** (CP57x), select the time program that is to be set.
4. Open the menu **Zones > CIRCA > Zone mode > Schedule**.

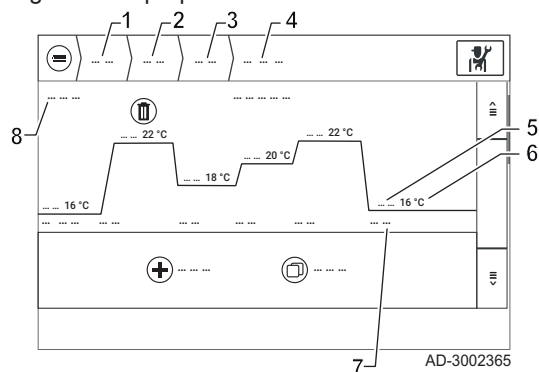
Fig.82 Opening the Schedule menu



- 1 Menu: Zones
- 2 Menu: *zone* (for example CIRCA)
- 3 Menu: Zone mode
- 4 Schedule

⇒ The pop-up window for interactive parametrisation opens.

Fig.83 Pop-up window Schedule



- 1 Menu: Zones
- 2 Menu: *zone* (for example CIRCA)
- 3 Menu: Zone mode
- 4 Parameter: Schedule
- 5 Activity (select to edit)
- 6 Target temperature for the respective activity
- 7 Starting time for the respective activity
- 8 Weekday for which the parameter Schedule will be applied

The weekdays are listed.

Switch between the weekdays using  and .





Important

By direct selection the following settings can be adjusted:

- Activity
- Time interval for the activity
- If required, deletion of an activity

Further functions:

-  **[Add new state]**: Add an additional activity to the time interval of an existing activity.
-  **[Copy day]**: Transfer the current time program to a different day of the week.

The temperatures that are assigned to the activities are those which have been set before in the menu **Zones > CIRCA > Zone mode > Activity setpoints**.

5. Select activity.

- 1 Selected activity
- 2 Parameter: Schedule

⇒ Buttons for selecting the activity and its time interval are displayed.

Fig.84 Select activity

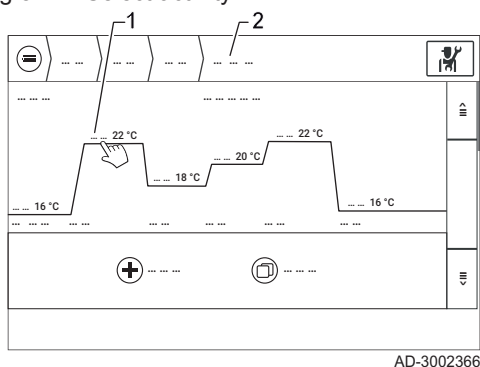
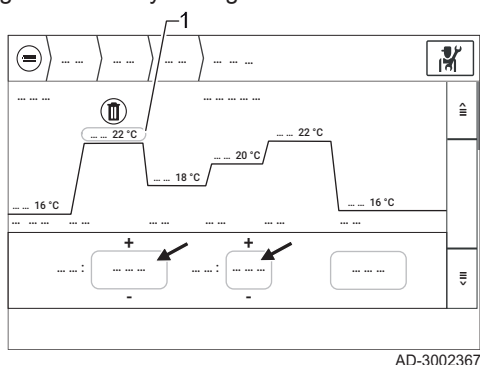


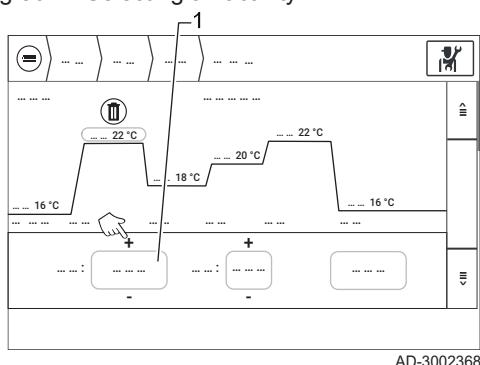
Fig.85 Activity settings



1 Selected activity

6. Select an activity by pressing **[+]** / **[-]**.

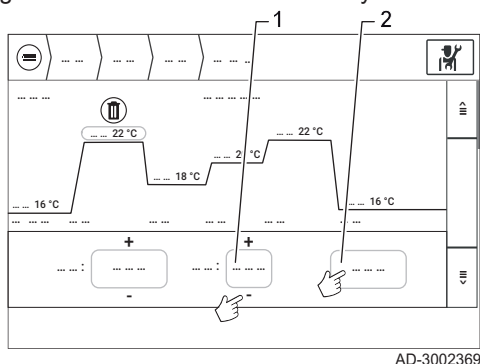
Fig.86 Selecting an activity



1 Button to change the activity

7. Set the start time for the time interval using **[+]** / **[-]** and confirm by pressing **[Save]**. The end time is defined by the start time of the subsequent activity.

Fig.87 Select start time for activity



1 Button to change the start activity


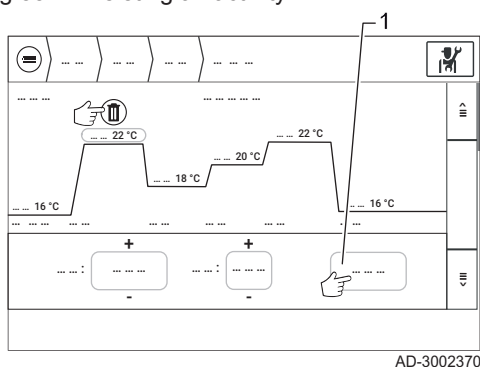
2 **[Save]**8. There is also the option to delete individual activities. To do so, select .

Fig.88 Deleting an activity

1 **[Save]**⇒ A pop-up window opens in which the deletion has to be confirmed by pressing **[Save]**.

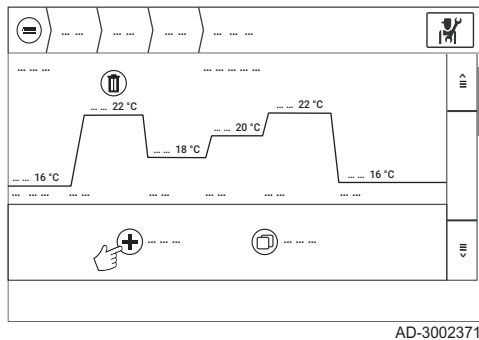
The activity is removed and the end time of the preceding activity is set as the start time for the next activity.

9. Optionally, additional activities can be added to an existing time program.

**Important**

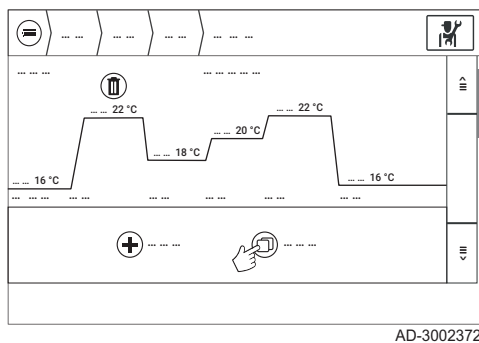
A time program can only comprise a maximum of six activities per day.

Fig.89 Additional activity



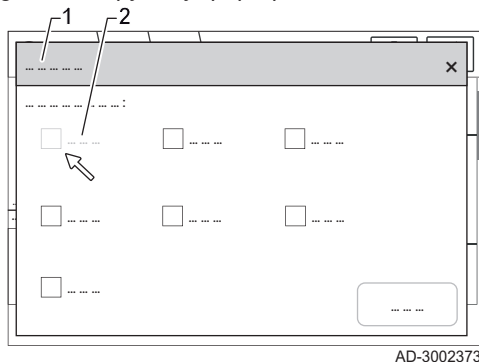
- 9.1. To do this, select **+** **Add new state**.
- 9.2. Select the time of an existing activity at which the new activity should end.
 - ⇒ The new activity is included. The end time for the new activity corresponds to the time that was previously selected.

Fig.90 Copy day



10. Optionally, the time program for a weekday can be transferred to one or more days of the week.

Fig.91 Copy "day" pop-up window

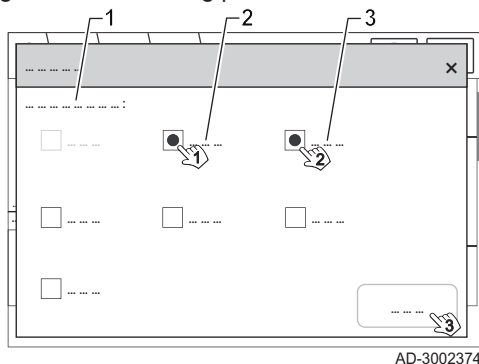


- 10.1. To do this, select **Copy day**.

- 1 Copy a day's (here Monday's) schedule
- 2 Monday

- ⇒ A pop-up window opens:
 - The previously parametrised day of the week is greyed out (in this case: Monday).
 - The days of the week to which the implemented parametrisation should be transferred can be selected via a selection field.

Fig.92 Transferring parametrisation



- 10.2. Select days of the week (here: Tuesday (1) and Wednesday (2)) and confirm by pressing **[Copy]** (3).

- 1 Copy the schedule for the following days
- 2 Tuesday
- 3 Wednesday

8 Commissioning

This chapter describes the basic procedure for commissioning. Settings must also be made on the controller. A detailed description of the *operation* of the controller can be found in the respective chapter of this manual.

More details of settings, connections and restrictions can be found here:



See

Hydronic Booklet - compendium of hydronic setups



Important

During commissioning some general conditions have to be observed.

- Settings at the controller have to be made for:
 - Boiler cascade
 - Heat pump cascade
 - Hybrid management
- If an independent heating circuit control unit is used, all settings concerning the **zone control** (heating circuit control) have to be made there.
 - If BDR Thermea zone controllers are used, at least a subset of menus and parameters might be accessible in the menu structure of CHVAC Main Controller. These screen outputs are to be taken for information purposes only.
- Even if an independent heating circuit control unit allows the control of **domestic hot water** preparation, this has always to be managed by the CHVAC System.

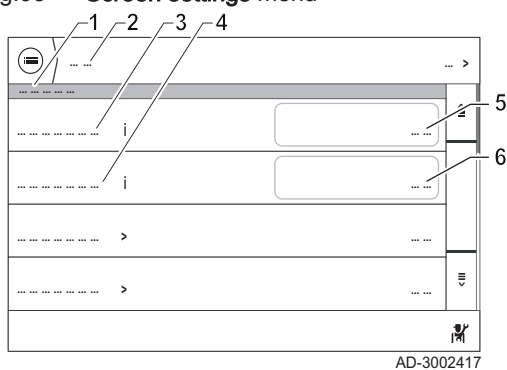


See also

Operation, page 41

8.1 Start screen

Fig.93 Screen settings menu



The **Screen settings** menu is displayed upon initial switching on.

- 1 Language and country
- 2 Menu: Screen settings
- 3 Parameter: Country
- 4 Parameter: Language
- 5 Country selection
- 6 Language selection

1. Set both the **Country selection** and **Language selection** parameters.
2. Exit the menu with **[Complete]**.

8.2 Commissioning procedure



Important

- Commissioning is mandatory for the correct functioning of the CHVAC System.
- Commissioning must be done by a qualified installer.
- The commissioning procedure must also be performed in the case of any change of the system set-up.
- Make sure that all producers that are to be controlled by the CHVAC Main Controller have been commissioned. The producers have to be commissioned separately before the commissioning of the CHVAC Main Controller.

For commissioning of the installation the following steps need to be performed. Details on each step are described in the subsequent chapters.

1. If an additional PCB has been installed, make sure that it has been installed correctly.
2. Make sure that temperature sensors have been installed correctly.
3. Make sure that the S-bus connections have been set-up correctly.
4. Set the producer sequence.
5. Set the power rating.
6. Make sure that the maximum flow temperature setpoint of the boilers has been set correctly.
7. Set the hybrid functionality parameters.
8. Make sure that the network communication is set-up correctly, if applicable.
9. Make sure that the connection with the Building Management System (BMS) is set-up correctly, if applicable.

8.2.1 Additional PCBs and gateways

1. Make sure that gateways for the connection of the producers are installed and set-up correctly.



See

Documentation of the respective gateway.

2. Make sure that the communication with a Building Management System (BMS optional) is installed and set-up correctly.

8.2.2 Temperature sensors

1. Make sure that the outdoor temperature sensor is installed and connected correctly.
2. Make sure that all required temperature sensors are installed and connected correctly.



See also

Installation examples, page 37

8.2.3 S-bus and L-bus connections

1. Make sure that the S-bus connections are installed and connected correctly, according to the instructions in the chapter *Installation*.
2. Make sure that the L-bus connections (optional) are installed and connected correctly, according to the instructions in the chapter *Installation*.

8.2.4 Set-up producer sequence



Important

If a cascade of producers is installed, the sequence of the producers has to be defined.

This has to be done for heat pump cascades as well as for boiler cascades.

In a newly installed cascade the producers are randomly identified and assigned a node ID by the CHVAC Main Controller upon start. Therefore the physical sequence of the producers will most likely not be identical to the sequence displayed.

The CHVAC Main Controller provides the functionality Autodetect to set the provider sequence within the controller in a user friendly way.



Important

- The functionality Autodetect has to be performed for each producer cascade independently.
- The switch On/Off procedure described in the following instruction depends on the connection variant of the respective producers:
 - Producers directly connected to the controller: The producer itself has to be switched On/Off
 - Producers connected via gateways to the controller: The respective gateway has to be switched On/Off to set the correct sequence number of the connected producer.
- The sequence of the switch On/Off procedure for the producers defines the set internal sequence number.

1. Turn off producer or the respective gateway.
2. Turn off the CHVAC Main Controller.
3. Turn on the CHVAC Main Controller again.
4. Perform an auto detection here:

►► Advanced service menu > Autodetect

⇒ A new node ID is assigned to each detected producer.



The first producer is always the leftmost producer on the screen.

5. Start the first producer or switch on the respective gateway and wait 10 seconds.
6. Repeat the previous step for all other producers in the desired sequence.
 - ⇒ It can take several minutes until all producers are detected and displayed in the cascade overview screen.
7. Make sure that the producers are recognized correctly in the cascade overview screen.

8.2.5 Setting the power rating

To ensure proper functioning of the CHVAC Main Controller, the values of maximum and minimum power of each producer need to be checked. The default value of the data-point, maximum power of the producer, is 100 kW. Also see the nominal power rating on the device's data plate.



Important

These settings have to be made for every producer.



Important

If the minimum power rating is not known, use 20 % of the maximum power rating.

**Important**

To set the power rating for heat pumps, navigate to the cascade control properties.

1. Activate installer mode.
2. Navigate to the boiler or heat pump cascade menu.
3. Select the desired producer.
4. Make sure the power ratings are set correctly.

8.2.6 Setting the maximum flow temperature of boilers

**Important**

Perform this action for each boiler.

**Important**

The maximum flow temperature is 90 °C.

1. Set each boiler to its maximum flow temperature.

8.2.7 Parametrising the hybrid functionality

**Important**

The hybrid functionality is pre-configured to operate cost-optimised (parameter HP061).

1. Set the corresponding parameters to the local values.
 - 1.1. HP062: Peak rate electricity cost (in cents)
 - 1.2. HP064: Cost of gas per m3 or oil per litre (in cents)

8.2.8 Setting the network connection

This commissioning step is only required if a network connection to the CHVAC Main Controller is established.

1. Select:

►► **Settings > Communication > Connection state**

2. Make sure that the settings are as follows:
 - 2.1. **Network cable connected:** OK
 - 2.2. **Internet is accessible:** OK
 - 2.3. **Connection state:** OK

8.2.9 Setting the BMS connection

This commissioning step is only required if the CHVAC Main Controller is connected to a Building Management System (BMS).

1. Make sure that the connection of the BMS to the gateways of the CHVAC Main Controller is installed and set-up correctly.

**See**

Documentation of the installed gateway.

2. Make sure that the BMS is parametrised correctly.

9 Settings

**See also**

Installation examples, page 37

9.1 User instructions

This section describes typical applications, such as temperature adjustment for heating circuits and domestic hot water circuits, Holiday mode, frost protection, etc.

9.1.1 Changing the room temperature

The room temperature can be adjusted in different ways using the settings on the controller.

►► Zones > Zone (for example CIRCA) > Zone mode

The procedure depends on the basic settings of the entire system. A distinction is drawn between controlling a heating circuit by:

- Schedule: Menu **Zone mode**, option: **Schedule**
- Manual control: Menu **Zone mode**, option: **Manual**

and the

- duration of the required change in temperature

■ Permanent adjustment of the room temperature setpoint.

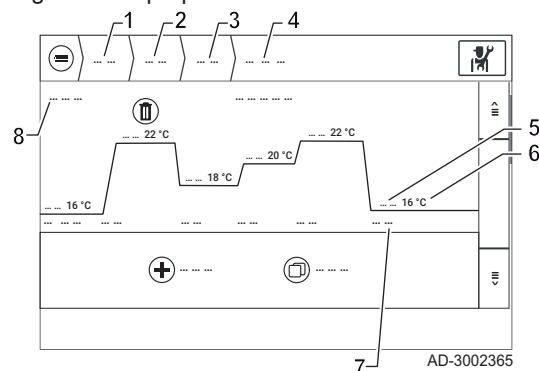
Permanent adjustment of the room temperature setpoint with a time program:

►► Zones > Zone (for example CIRCA) > Schedule

Variant a) Configuring the parameters of the time program:

- 1 Menu: Zones
- 2 Menu: *zone* (for example CIRCA)
- 3 Menu: Zone mode
- 4 Parameter: Schedule
- 5 Activity (select to edit)
- 6 Target temperature for the respective activity
- 7 Starting time for the respective activity
- 8 Weekday for which the parameter Schedule will be applied

Fig.94 Pop-up window Schedule



The time program can be individually adjusted for each zone (heating circuit) controlled by the time program.

In order to adjust the room temperature, the time interval for an existing activity can be changed, a different activity can be assigned to the required time period, or activities can be deleted or added to the time program again.

Variant b) Adjusting Activity setpoints:

►► Zones > Zone (for example CIRCA) > Zone mode > Activity setpoints

For each zone (heating circuit) controlled by a time program, the room temperature setpoint for the relevant activity can be **directly** adjusted in the menu.

Permanent adjustment of the room temperature setpoint without a time program (manual control):

Menu path: **Zones > Zone (for example CIRCA) > Zone mode**

If option **Manual** (CP20x) is set for setting parameter **Operating mode of the zone** (CP32x), the setpoint temperature will be set **directly** for the relevant zone.

To do this, enter the required target temperature for setting parameter **Manually setting ZoneRoomTempSetpoint** (CP20x).

■ Changing the room temperature for a specified time period

►► Zones > Zone (for example CIRCA)

If the room temperature setpoint is only to be temporarily adjusted, there are two options available.

- For an immediate, time-limited adjustment: **Temporary temperature adjustment** CommercialTank Boost(Party mode)

►► **Zones > Holiday mode**

- Adjustment with a specified start and end: **Holiday mode**

Variant a) Temporary temperature adjustment:

- Enter the duration of the change in temperature using the date field of the **Zone End Time of change Mode** parameter.
- Enter the required room temperature setpoint using the **Zone temporary room setp** (CP510) parameter.

Once the set time period has elapsed, the system will reset to the previous settings.

Variant b) Holiday mode:

- Enter the start of the change in temperature using the date field of the **Start date holiday** parameter.
- Enter the duration of the change in temperature using the date field of the **End date holiday** parameter.
- Enter the required room temperature setpoint using the **Room temperature setpoint during holidays** (CP060) parameter.

Once the set time period has elapsed, the system will reset to the previous settings.

9.1.2 Changing the domestic hot water temperature (DHW)

The domestic hot water temperature can be adjusted in different ways using the settings on the controller.

►► **Zones > DHW**

The procedure depends on the basic settings of the entire system. A distinction is drawn between controlling a heating circuit by

- Schedule: Menu **Zone mode**, option **Schedule**
- Manual control: Menu **Zone mode**, option **Manual**

and the

- duration of the required change in temperature

■ Permanent adjustment of the domestic hot water temperature

Permanent adjustment of the domestic hot water setpoint with a time program:

►► **Zones > Zone (for example DHW > Zone mode > Schedule**

Variant a) Configuring the parameters of the time program:

The time program can be individually adjusted for each DHW zone controlled by the time program.

Two activities are available for domestic hot water generation:

- Comfort
- Reduced

In order to adjust the domestic hot water temperature, the time interval for an existing activity can be changed. The second activity can be assigned to the required time period. In addition activities can be deleted or added to the time program again.

Variant b) Adjusting DHW temperature setpoints:

►► **Zones > DHW > DHW temperature setpoints**

For each DHW zone controlled by time program, the domestic hot water temperature setpoint for both activities can be **directly** adjusted in the menu.

Permanent adjustment of the domestic hot water setpoint without a time program (manual control):

►► Zones > DHW > Zone mode

If option **Manual** (CP20x) is set for setting parameter **Operating mode of the zone** (CP32x), the setpoint temperature will be set **directly** for the relevant zone.

Enter the required target temperature under:

- **Comfort Zone Domestic Hot Water Setpoint** (CP35x)

■ Changing the domestic hot water temperature for a specified time period

►► Zones > Holiday mode

If the domestic hot water setpoint is only to be temporarily adjusted, the **Holiday mode** menu is available for this. However, this function reduces the temperature equally for all heating circuits and/or domestic hot water circuits.

- Enter the start of the change in temperature using the date field of the **Start date holiday** parameter.
- Enter the duration of the change in temperature using the date field of the **End date holiday** parameter.
- Enter the required room temperature setpoint using the **Room temperature setpoint during holidays** (CP06x) parameter.

Once the set time period has elapsed, the system is reset to the previous settings.

9.1.3 Energy saving tip: Holiday mode

With just a few settings, the appliance can be set to the energy-saving **Holiday mode**, for example when you are away for prolonged periods.



Important


- In this mode, all of the zones are deactivated but the frost protection function always remains active.
- The **Holiday mode** operating mode will be commonly set for all zones (heating circuits and domestic hot water circuits).


►► Zones > Holiday mode

9.2 Installer instructions


9.2.1 Activating the installer level

You can switch to the **installer level** from any window using  in the header of the respective window.

1. Select  in the header.
⇒ A pop-up window opens for entering the installer level code.
2. Enter the four-digit code using the numeric keypad.
⇒ You do not have to confirm your entry. You can switch to the **installer level** directly after entering the fourth digit of the code.



The active **installer level** is indicated by highlighted symbols  in the header as well as at the bottom of the respective window.

9.2.2 Exiting the installer level

You can switch from the **installer level** back to the **user level** (operator mode) from any window using  in the header of the respective window.

**Important**

The installer level is deactivated automatically if no action has been performed on the CHVAC Main Controller for a minimum of 30 minutes.

1. Select  in the header.
 - ⇒ The pop-up window for confirming the return to the **user level** (operator mode) opens.
2. Select **[Confirm]** in the pop-up window.
 - ⇒ The interactive mode is reset to user level, which is indicated by:
 - The highlighted symbol  in the header is set back to default appearance and the symbol at the bottom of the respective window vanishes.

9.2.3 Controller interface basic settings

This section describes the settings of the user interface.

■ Date and time

▶▶ Settings > Date and time

The system time can be set using one of the following parameters:

- Date and time settings
- NTP update enabled

The time is automatically synchronised with all connected components, both internally and externally (for example zone controllers).

– Date and time settings

▶▶ Settings > Date and time > Date and time settings

Display and setting of the date and time.

**Important**

Always set the local time.

The changeover from winter time to daylight saving time and vice-versa is initiated automatically.

– NTP update enabled

▶▶ Settings > Date and time > NTP update enabled

Time synchronisation via Internet is activated/deactivated.

Prerequisites:

- The controller is connected to the Internet.
- The controller is connected to the time server via the NTP port 123.

Possible setting values:

- Off
- On

Default setting:

- Off

The time is automatically adjusted to the time zone. If, in the event of a fault, there is no Internet connection, the time continues to run correctly using the internal system time.

■ Language and keyboard

▶▶ Settings > Language and keyboard

Language and user interface keyboard type settings.

– Country selection

▶▶ Settings > Language and keyboard > Country selection

Display and selection of the country setting for the user interface (for example for defining the date format that is displayed).

– Language selection

▶▶ Settings > Language and keyboard > Language selection

Display and setting of the required language for the user interface.

– Keyboard settings

▶▶ Settings > Language and keyboard > Keyboard settings

Selection of the keyboard layout for input on the display.

Possible settings:

- German (QWERTZ)
- QWERTY (English keyboard)

Default setting:

- QWERTY (English keyboard)

■ Screen settings

▶▶ Settings > Screen settings

Settings for the CHVAC Main Controller display.

– Screen brightness

▶▶ Settings > Screen settings > Screen brightness

Display of the screen brightness in %.

9.2.4 Parametrising the zones

■ Operating mode of the zone

▶▶ Zones > *Zone* (for example CIRCA) > Zone mode > Operating mode of the zone

Display and setting of the operating mode for the respective zone.

For each zone, you can choose between three **operating modes**. This applies irrespective of the assignment of a zone as, for example, a heating circuit or domestic hot water circuit.



Important

If an outdoor temperature sensor is installed and has been detected by the control unit, weather-compensated operation will be chosen as a standard.

In doing so, the operating mode determines the **room temperature setpoint** (CM19x). Along with the outdoor temperature measurement, this setpoint defines the heating curve and consequently a setpoint for the heating circuit.

When operating without an outdoor temperature sensor, the setpoint for the heating circuit is manually specified (CP01x).

- **Scheduling:** Control via a parametrisable time program.
- **Manual** (CP20x): The setpoint temperature is kept at a constant level.
- **Off:** Frost protection mode is only activated if the temperature falls below the frost protection limit (AP080) (outdoor temperature measurement required).

1. Select the menu **Zones > Zone (for example CIRCA) > Zone mode > Operating mode of the zone.**
⇒ A pop-up window opens to select the required operating mode.
2. Select the required operating mode and confirm by pressing **[Done]**.

■ Function of Zone

►► System > Function of Zone



Settings can only be entered in the installer level 

Display and setting of the function for all available zones (heating circuits, domestic hot water circuits).

The list of zones is structured by device and is shown in alphabetical order for each device.

During the commissioning process, these settings have to be configured **before** the heating circuit parameters and the Zones parameters are defined as described below.

Assigning a function means that the framework conditions for the parametrisation of the relevant zone are defined.

For the approved hydronics two options have to be distinguished:


1. If zones (heating circuits) are controlled in an independent way with respect to CHVAC Main Controller, the setting has to be **Direct**. This can be due to:
 - Control of the zones by third party controllers
 - No external zone control at all
2. If the zones (heating circuits) are controlled by controllers which can be connected to the CHVAC Main Controller, the setting **Disabled** has to be selected.

Selecting the zone function in the **Function of Zone** menu has a significant impact on the framework conditions for heat provision in the relevant zone. The consequences for selected settings are as follows:

- **Direct:**
 - No flow temperature sensor
 - Connection of a central heating pump is optional (at heating circuit station only)
 - The zone temperature setpoint from the settings in the **Zones** menu for the relevant zone is taken from the heating curve (weather-compensated with outdoor temperature sensor) or directly by specifying the parameter **Manually setting ZoneRoomTempSetpoint** (CP20x)
 - The control unit can use the temperature setpoint for charging a buffer tank, provided that there are no other setpoint value settings from other zones (e.g. fallback option if the heating circuit controller fails)
- **High Temperature:**
 - Identical to the *Direct* function but with no summer/winter time changeover
- **Mixing Circuit:**
 - Required components: Flow temperature sensor, mixing valve and central heating pump
 - Mixing valve control depending on the measured flow temperature and temperature setpoint
 - The zone temperature setpoint from the settings in the **Zones** menu for the relevant zone is taken from the heating curve (weather-compensated with outdoor temperature sensor) or directly by specifying the parameter **Manually setting ZoneRoomTempSetpoint** (CP20x)
 - The control unit can use the temperature setpoint for charging a buffer tank

■ Setting the Heating curve

►► Zones > Zone (for example CIRCA) > Heating curve

💡 Settings can only be entered in the service level 

Important

It is only possible to set the heating curve if an outdoor temperature sensor is connected. Otherwise the value for parameter **TFlow zone setpoint** (CP01x) applies.

You can use the heating curve to define the relationship between the outdoor temperature and the flow temperature. The minimum and maximum temperature and gradient (steepness) of the heating curve are used to adjust the operating parameters of the producers to the ambient conditions (outdoor temperature).

Important

The basis for calculating the heating curve is a room temperature setpoint of 20 °C.

1. In the **Zones** menu, select the heating circuit that is to be adjusted.
2. Select the **Heating curve** sub-menu.
3. Setting the slope of the curve:

- 1 Min. Temp.
- 2 Slope
- 3 Max. Temp.
- 4 Setting of: Max. Temp.
- 5 Setting of: Min. Temp.
- 6 Setting of: Slope
- 7 Outside temperature
- 8 Flow temperature heating circuit

Fig.95 Parametrise Heating curve

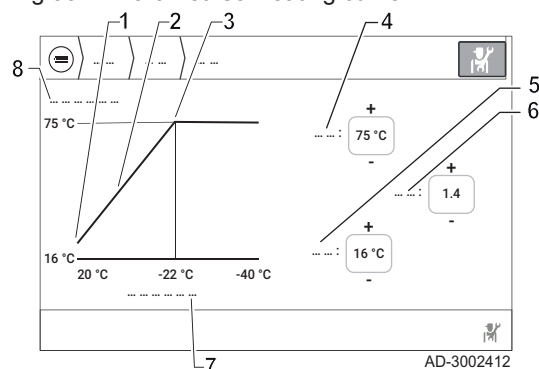
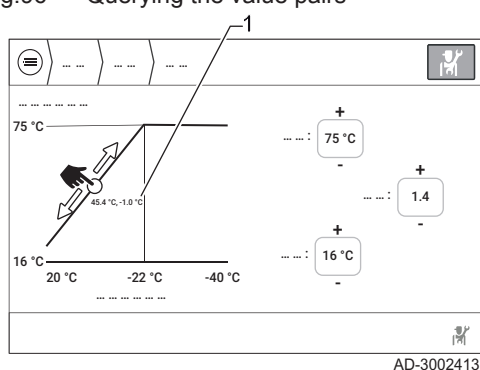


Fig.96 Querying the value pairs



- 1 Assigned temperature values for the selected position of the heating curve
- 3.1. **Max. Temp. (1):** Maximum flow temperature of the heating circuit.
- 3.2. **Min. Temp. (2):** Minimum flow temperature of the heating circuit.
- 3.3. **Slope (3):** Gradient (steepness) of the heating curve. In cases where the minimum and maximum temperatures are fixed, the gradient of the heating curve determines the outdoor temperatures at which certain flow temperatures should be reached.

Important

When entering 15 °C as the minimum temperature, the **Zone, room temperature setpoint** parameter is used.

- ⇒ The associated value pairs (outdoor temperature, flow temperature) are displayed when the corresponding position on the heating curve is selected.

Tab.12 Factory settings for the individual zones

Zone ⁽¹⁾	Maximum temperature (CP00x)	Gradient (CP23x)	Minimum temperature (CP21x)
CIRCA	90 °C	1.5	15 °C
CIRCB	50 °C	0.7	15 °C
CIRCC	50 °C	0.7	15 °C
(1) Depending on availability			

Tab.13 Examples for parametrising the heating curve

Heating characteristics	Action	Example
Zone is too cold during the cold season .	Increase the gradient of the heating curve.	Increase the gradient (CP23x) from 1.2 to 1.3 .
Zone is too warm during the cold season .	Decrease the gradient of the heating curve.	Decrease the gradient (CP23x) from 1.3 to 1.2 .
Zone is too cold during the cold season and in the transitional period .	Increase the minimum temperature of the heating curve.	Increase the minimum temperature (CP21x) from 35 °C to 40 °C .
Zone is too warm during the cold season and in the transitional period .	Decrease the minimum temperature of the heating curve.	Decrease the minimum temperature (CP21x) from 40 °C to 35 °C .
Zone is too cold in the transitional period , but is warm enough during the cold season .	Decrease the gradient of the heating curve, increase the minimum temperature .	Decrease the gradient (CP23x) from 1.3 to 1.2 , increase the minimum temperature (CP21x) from 35 °C to 40 °C .
Zone is too warm in the transitional period , but is warm enough during the cold season .	Increase the gradient of the heating curve, decrease the minimum temperature .	Increase the gradient (CP23x) from 1.2 to 1.3 , decrease the minimum temperature (CP21x) from 40 °C to 35 °C .

9.2.5 Adjusting the hybrid functionality of the system

Basic framework condition:



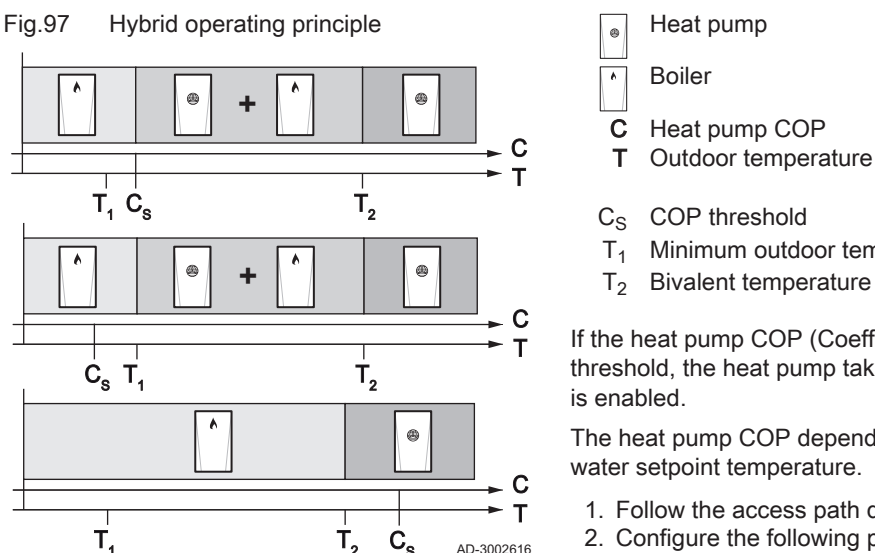
Important

Make sure to align the maximum flow temperature of the boilers to at least the maximum flow temperature of your installation .

■ Configuring the hybrid operating mode

The hybrid function consists of an automatic switch between the heat pump and the boiler, according to the cost, the consumption or emission of CO₂, respectively.

Fig.97 Hybrid operating principle



Use the Symbol ID with the Search functionality to access the parameters.

Parameter	Description	Adjustment
Min outdoor T HP HP051	Minimum outdoor temperature below which the compressor of the Heat Pump is stopped	Indicate the outdoor temperature below which only the back-up ensures heating. Factory setting: -15 °C
Boiler efficiency HP068	Boiler efficiency in hybrid system	Factory setting: 100 %
Bivalent temperature HP000	Above the bivalent temperature, the backup energy source is not allowed to operate. Only the heat pump is authorised to function.	Set according to the surface being heated and the dimensions of the heat pump. Factory setting: 15 °C.
Hybrid mode HP061	Hybrid mode selection to choose on what basis the hybrid system will optimise	Factory setting: Hybrid Cost. The control system chooses the cheapest producer. Other available values: <ul style="list-style-type: none"> • No Hybrid : no optimisation. The heat pump always starts up first, regardless of the conditions. The boiler back-up starts up afterwards, if necessary. • Primary Energy : the control system chooses the producer that consumes the least primary energy. • Hybrid CO2 : the control system chooses the producer that emits the least CO₂.

3. Depending on the selected Hybrid mode, more parameters need to be configured in following menu.

- No Hybrid : no other parameter to be configured
- Hybrid Cost

Parameter	Description	Adjustment
Peak elec cost HP062	Peak rate electricity cost (in cents) (per kwh)	Enter the price of electricity at peak rate. Factory setting: 60 euro cents per kWh.
Gas or oil cost HP064	Cost of gas per m3 or oil per litre (in cents)	Enter the price of fuel. Factory setting: 250 euro cents (per m ³ for gas, per litre for oil).

Parameters that have to be checked or adjusted are:

- HP062
- HP064
- Primary Energy

Parameter	Description	Adjustment
COP Threshold HP054	COP threshold above which the heat pump is authorised to operate	Factory setting: 2.5

• Hybrid CO2

Parameter	Description	Adjustment
CO2 coef elec CH HP065	CO2 emissions coefficient of electricity in heating mode	Factory setting: 45
CO2 coef of gas/oil HP067	CO2 emissions coefficient of gas or oil	Factory setting: 19

■ Definition of heat pump parameters - delay time & set-point hysteresis

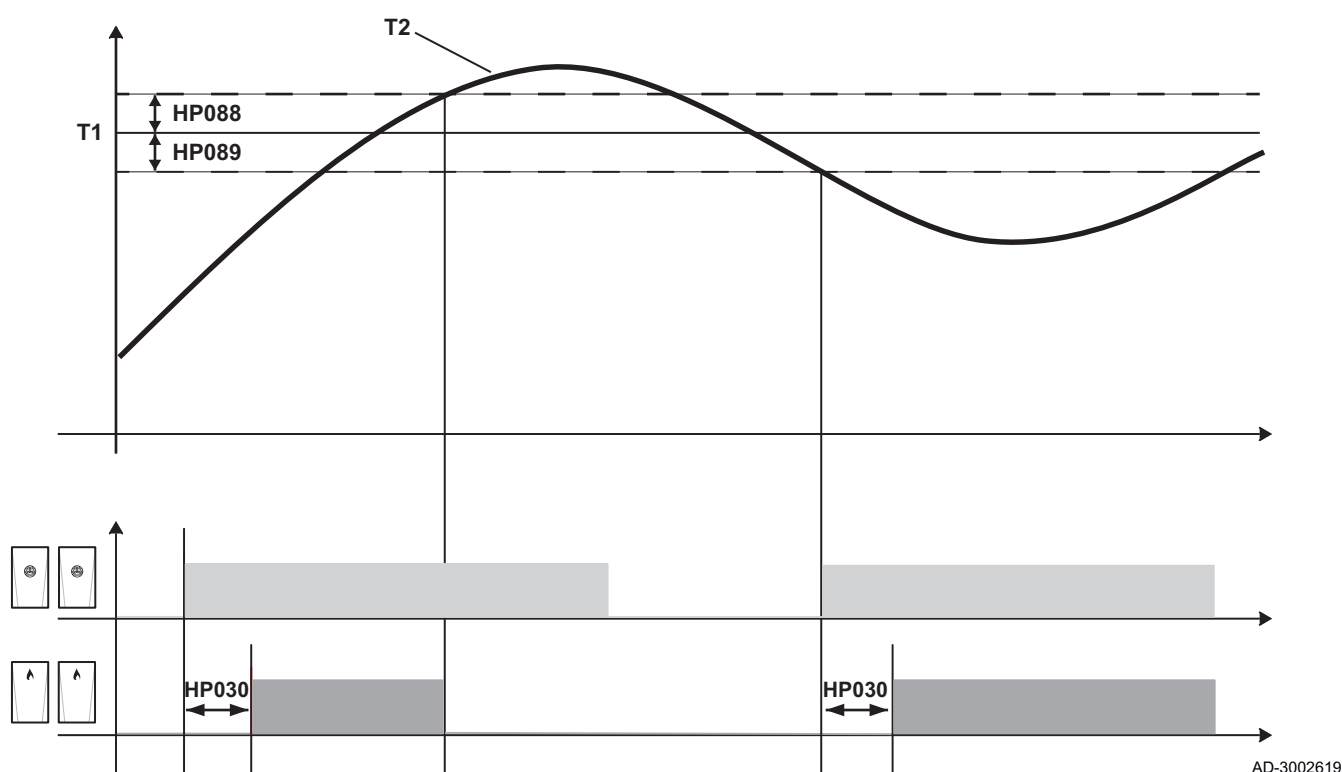
The hybrid function consists of an automatic switch between the heat pumps and the boilers. The activation of the respective producers depends on the efficiency and the ability to provide the requested flow temperature.

Use parameters HP030 and DP090 to set the desired timespan to delay boiler backup during a heat demand.



Parameter HP030 ensures a delay time for boiler backup during a CH demand.

Parameter DP090 ensures a delay time for boiler backup during a DHW demand.

Fig.98 Parameter definition



AD-3002619

-  Heat pump
-  Boiler
- T1** Internal setpoint
- T2** Control temperature
- HP088** Setpoint hysteresis high (Setpoint temperature hysteresis to stop the heat production)

- HP089** Setpoint hysteresis low (Setpoint temperature hysteresis to start the heat production)
- HP030** Delay time for starting backup for CH (Delay time for starting the backup energy source for the heating circuits)

9.2.6 The menu *Outdoor temperature*

►► Zones > Outdoor temperature

The **Outdoor temperature** menu provides parameters for weather compensation.

The requirement for an outdoor temperature sensor depends on the hydraulic design of the entire system. If the appliance is integrated into the flow or return of an independently controlled on-site system without system technology, the use of the outdoor temperature sensor is required. For all other hydraulic integrations, a *AF60* outdoor temperature sensor must be used.



Important

The outdoor temperature sensor type is automatically detected as soon as it is connected. The currently detected outdoor temperature sensor type is displayed in the following menu:

System > System settings > Outdoor temperature > Enable outdoor sensor (AP056)

The menu is available if an outdoor temperature sensor of type *AF60* has been installed and detected by the system.

If an outdoor temperature sensor has been detected by the system, the temperature setpoint of the relevant zone (CM07x) is determined from the outdoor temperature and the set heating curve (**Zones > Zone (for example CIRCA) > Heating curve**).

If **no** outdoor temperature sensor has been detected by the system, the higher of the two temperature setpoints **TFlow zone setpoint** (CP01x) or **Maximum T.Flow setpoint zone** (CP00x) will be used.

If there is no outdoor temperature sensor, the **Heating curve** menu will not be available and the seasonal mode will be permanently set to **Winter**.

■ **AP073 -Outdoor temp: upper limit for heating**

General

Based on the outdoor temperature, the seasonal mode is defined globally for all components.

This means:

- **For winter:**
 - Active, if the averaged outdoor temperature falls below the temperature defined here. The average value is defined by the two hour average **and** the long-term average. The long term average depends on the setting of *AP079* (default 22 h).
 - Heating mode is active.
 - Domestic hot water generation is active.
- **For summer:**
 - Active, if the averaged outdoor temperature exceeds the temperature defined here. The average value is defined by the two hour average **or** the long-term average. The long term average depends on the setting of *AP079* (default 22 h).
 - Heating mode is deactivated (exception: Frost protection).
 - Domestic hot water generation is active.



Important

Regardless of the outdoor temperature, summer mode is active if the **Force summer mode** parameter is set to *On*.



Important

If you select the maximum upper limit for the outdoor temperature (30.5 °C), the system switches to a forced, permanent winter mode.

Description of the parameter

Display and setting of the upper limit for the outdoor temperature in °C.

Possible setting values:

- Minimum: 5 °C
- Maximum: 30.5 °C

Basic setting:

- 22 °C



The time component for switching between summer and winter mode is defined using the **Inertia of the building** (AP079) setting.

■ **AP074 -Force summer mode**

Display and entry of the current status of summer/winter mode.



Important

Irrespective of the setting for this parameter, winter mode is active if the **Outdoor temp: upper limit for heating** (AP073) parameter is set to 30.5 °C.

Possible setting values:

- Off: Summer mode deactivated
- On : Summer mode active, regardless of the measured outside temperature

Basic setting:

- Off

■ **AP078 – Outside sensor detected in application**

Display showing whether the outdoor temperature sensor has been detected by the control software.

Possible displays:

- No (temperature sensor not detected)
- Yes (temperature sensor detected)

■ **AM027 – Outside temperature**

Display of the outdoor temperature in °C, measured by the *outdoor temperature sensor*.

■ **AM091 – Seasonal mode active (summer / winter)**

Display of the activated seasonal mode.

Possible displays:

- Winter
- Off
- Summer

■ **AP080 – Outside temp antifreeze activated**

Display and entry of the outdoor temperature in °C below which the frost protection function is activated, provided that there is no further demand for the producer units. Heating mode is active when the frost protection function is active and the *frost protection* operating mode is displayed.

Possible setting values:

- Minimum: -30 °C
- Maximum: 20 °C

Basic setting:

- 3°C

If the specified temperature threshold is not reached, all zones for which the setting parameter **Operating mode of the zone** (CP32x) is set to **Off** (frost protection) will be switched to frost protection mode. This means that the room temperature setpoint is set to **Zone RoomTemperature setpoint on holiday**.

■ **AP079 – Inertia of the building**

The time constant of a building is a measurement for the heat storage capacity in the interior rooms of a building. The **Inertia of the building** parameter specifies the degree of importance of the outdoor temperature with regard to the building's heat demand.

Possible settings:

- Minimum: 0: The time constant of the building is not taken into account; suitable for buildings without effective insulation.
- Maximum: 10: High importance of the outdoor temperature; suitable for buildings with outstanding insulation (for example low-energy standard).

Basic setting:

- 3: Suitable for buildings with standard insulation.

■ **AP056 -Enable outdoor sensor**

Display and selection of the installed outdoor temperature sensor.

Possible setting values:

- No outside sensor
- AF60
- QAC34

Basic setting:

- AF60



Important

It is only possible to deactivate the outdoor temperature sensor if it is not connected. If an outdoor temperature sensor from the list is connected, the corresponding setting is automatically activated.

9.2.7 Network settings

This section describes displays and settings for connecting the controller for remote online access.



Important

To make it easier to find the described parameters in the controller menu, the corresponding symbol IDs are specified in the sections below, for example: **CP32x – Operating mode of the zone**. If there is no symbol ID available for a parameter, the corresponding menu path is specified, for example: **Settings > Date and time**

■ **Connection state**

▶▶ **Settings > Communication > Connection state**

Displays the status of the network connection.

– **Network cable connected**

▶▶ **Settings > Communication > Connection state > Network cable connected**

Displays whether a network cable is connected.

Possible displays:

- OK: Network cable detected
- NOK: No network cable detected

– **Internet is accessible**

▶▶ **Settings > Communication > Connection state > Internet is accessible**

Status display for internet access.

Possible displays:

- OK: Internet access possible
- NOK: Internet access not possible

– Server connection

▶▶ Settings > Communication > Connection state > Server connection

Status display for access to the back-end server.

Possible displays:

- OK: Access possible
- NOK: No access

■ Connection test

▶▶ Settings > Communication > Connection test

This section describes tests for checking the remote access to the controller.

– Test network connection

▶▶ Settings > Communication > Test network connection

Availability test for the server connection.

– Ping Google

▶▶ Settings > Communication > Ping Google

Check of the internet connection by means of a Google ping test.

– Ping DNS

▶▶ Settings > Communication > Ping DNS

Availability test for the DNS server. The server is pre-defined in the software.

– Ping address

▶▶ Settings > Communication > Ping address

Availability test for a target medium with a freely definable IP address.

– Restart network

▶▶ Settings > Communication > Restart network

Restart the network connection.

■ Ethernet settings

▶▶ Settings > Communication > Ethernet settings

This menu contains a compilation of important Ethernet settings for setting up remote access to the controller.

– Network configuration

▶▶ Settings > Communication > Ethernet settings > Network configuration

Display and setting of the network configuration.

Possible settings:

- DHCP

- Static

Basic setting:

- DHCP

If a connection with dynamic IP addressing is established, the default setting can remain unchanged.

If problems occur with dynamic IP addressing, diagnostics menus are available under

▶▶ **Settings > Communication > Connection test**

.

If there is to be no connection with IP addressing, the setting **Static** must be selected in the menu

▶▶ **Settings > Communication > Ethernet settings > Network connection**

.

In this case, the following parameters must be set:

- IP-address
- Netmask
- Broadcast
- Gateway
- Nameserver

– IP-address

▶▶ **Settings > Communication > Ethernet settings > IP-address**

Display and setting of the IP address.

- A setting can only be configured if the **Network connection** parameter has been previously parametrised as **Static**.
- If the **Network connection** parameter has previously been parametrised as **DHCP**, only the IP address is displayed.

– Netmask

▶▶ **Settings > Communication > Ethernet settings > Netmask**

Display and setting of the net mask.

- A setting can only be configured if the **Network connection** parameter has been previously parametrised as **Static**.
- If the **Network connection** parameter has previously been parametrised as **DHCP**, only the IP address is displayed.

– Broadcast

▶▶ **Settings > Communication > Ethernet settings > Broadcast**

Display and setting of the broadcast address.

- A setting can only be configured if the **Network connection** parameter has been previously parametrised as **Static**.
- If the **Network connection** parameter has previously been parametrised as **DHCP**, only the IP address is displayed.

– Gateway

▶▶ **Settings > Communication > Ethernet settings > Gateway**

Display and setting of the gateway address.

- A setting can only be configured if the **Network connection** parameter has been previously parametrised as **Static**.

- If the **Network connection** parameter has previously been parametrised as **DHCP**, only the IP address is displayed.

– Nameserver

►► Settings > Communication > Ethernet settings > Nameserver

Display and setting of the name server.

- A setting can only be configured if the **Network connection** parameter has been previously parametrised as **Static**.
- If the **Network connection** parameter has previously been parametrised as **DHCP**, only the IP address is displayed.

– Saving the settings

To apply the settings, the **Save and restart network** menu item must be executed in the **Ethernet settings** menu.



Important

Without saving and restarting, all changes made will be lost.

1. In the menu **Settings > Communication > Ethernet settings**, select the **Save and restart network** menu item.
 - ⇒ The implemented parametrisation is applied and confirmation to restart the network is requested.
2. Close the request by pressing **[Confirm]**.
 - ⇒ The parametrisation of the remote connection is finished.

9.2.8 Connecting the installation to a Smart Grid

The CHVAC Main Controller can receive and manage control signals from the "smart" energy distribution network (**Smart Grid Ready**). Based on the signals received by the terminals of the **DI_1** and **DI_2** multifunction inputs, the heat pump shuts down or voluntarily overheats the heating system to optimise electricity consumption.

Tab.14 Operation of the heat pump in a **Smart Grid**

DI_1	DI_2	Operating mode
Inactive	Inactive	Normal mode: the heat pumps operate normally.
Active	Inactive	Reduced: the heat pumps are switched off.
Inactive	Active	Boost: the heat pumps voluntarily overheat the system.
Active	Active	Super boost: the heat pumps voluntarily overheat the system to the maximum heat pump temperature.

Overheating is activated depending on whether the dry contact on inputs **DI_1** and **DI_2** is open or closed, and on the settings of the Digital Input 1 logic (AP098) and Digital Input 2 logic (AP099) parameters which control the activation of functions, with respect to the open or closed position of the contacts.

1. Switch off the power supply to the CHVAC Main Controller
2. Connect the **Smart Grid** signal inputs to the **DI_1** and **DI_2** inputs on the IO-01 PCB.



Important

Smart Grid signals must come from potential-free contacts.

3. Turn on the electricity supply to the CHVAC Main Controller
4. Follow the access path in the installer level: **System > IO configuration > IO-01 > Low voltage inputs > Input configuration**

5. Configure the digital input functionality.

Tab.15 Digital input configuration

Parameter	Description	Setting
EP153	Digital Input 1 configuration	1 = SmartGridInput1
EP156	Digital Input 2 configuration	2 = SmartGridInput2

6. Follow the access path in the installer level: System > IO configuration > IO-01 > Low voltage inputs > Input logic
7. Configure the digital input contact configuration.

Tab.16 Digital input logic

Parameter	Description	Setting
AP098	Digital Input 1 logic	Closed = input active on closed contact
AP099	Digital Input 2 logic	Closed = input active on closed contact

⇒ The CHVAC Main Controller is ready to receive and manage **Smart Grid** signals.

■ Checking Smart Grid-status

Tab.17 Description of Smart Grid mode

Datapoint	Description	Menu path	Settings
varApSmartGrid-CurrentMode	The current mode of the Smart Grid	System > Hybrid management > Status	0 = Off 1 = Normal mode 2 = Reduced 3 = Boost 4 = Super boost

9.2.9 Silent mode

Use silent mode to reduce the amount of sound the heat pump(s) make. This can affect the level of comfort.

You can set all related parameters in the heat pump cascade menu, under silent mode. Set all parameters for each heat pump.

Tab.18 Silent mode parameters

Friendly name	Datapoint	Description	Settings
HP058	parHpSilentMode	Heat pump silent mode level	0: Silent mode is not running for the outdoor unit. 1: Outdoor unit runs in silent mode level 1. 2: Outdoor unit runs in silent mode level 2. 3: Outdoor unit runs in silent mode level 3.
HP094	parHpStartTime-LowNoise	Start time of the heat pump low noise function	
HP095	parHpStopTime-LowNoise	End time of the heat pump low noise function	

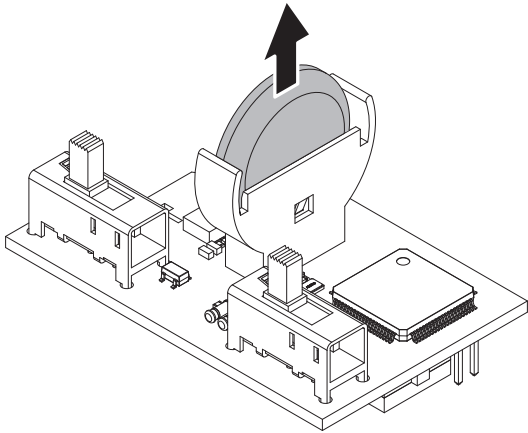
Tab.19 Silent mode measurement

Friendly name	Datapoint	Description	Measurements
AM002	varApLowNoise	Silent mode function enabled	0: Silent mode is not running for the outdoor unit. 1: Outdoor unit runs in silent mode level 1. 2: Outdoor unit runs in silent mode level 2. 3: Outdoor unit runs in silent mode level 3.

10 Maintenance

10.1 Replacing the battery on CLK-01

Fig.99 Replacing the battery



AD-3002772-01

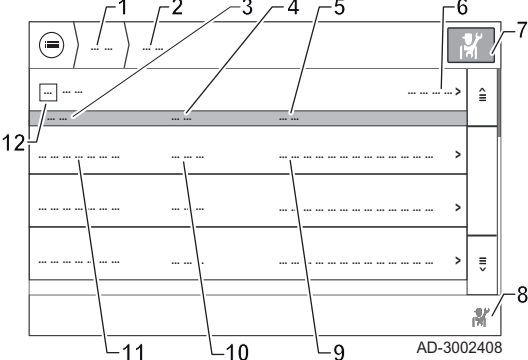
1. Unpack the new battery.
2. If the battery is low: Pull the old battery up and out.
3. Insert the new battery into the holder.

i Important
The battery is not a spare part. Only use a CR 2032 Lithium Manganese Dioxide battery, which is commercially available.

11 Troubleshooting

11.1 Error list menu

Fig.100 Error list



AD-3002408

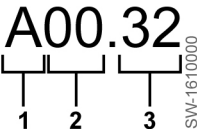
- 1 Menu: Servicing
- 2 Menu: Error list
- 3 Time
- 4 Error
- 5 Message
- 6 Clear error list
- 7 Activated, if menu opened in service mode
- 8 Displayed, if menu opened in service mode
- 9 Description of error
- 10 Service code
- 11 Time stamp of error
- 12 Number of listed errors

A list of the last service codes that have occurred is displayed in the menu **Servicing > Error list**.

- Chronological display of the warnings and errors that have occurred.
- Active service codes are highlighted in bold.
- Scroll using **↑** and **↓**.
- When an entry is selected, a detailed description of the service code is displayed.
- The list can be deleted using the **Clear error list** command. To do so, confirm the prompt by pressing **[Yes]**. Select **[Cancel]** to cancel the deletion process.

11.2 Structure of service codes

Fig.101 Structure of service codes






The service code display has the following structure:

- 1 Service code type (example: A = WARNING)
- 2 Service code category (example: 00 = sensors and probes)
- 3 Service code number (in the example: 32 = outdoor temperature sensor has been removed or measures a temperature below the permissible range)

The service codes are categorised into three types: **A**, **H** and **E**:

Tab.20 Service code types


Service code type		Icon	Result
A	WARNING		Appliance remains in operation
H	BLOCKING ERROR		Appliance stops. Operation is continued automatically as soon as the cause of the error is eliminated
E	LOCKING ERROR		Appliance stops. The appliance can be manually unlocked as soon as the cause of the error has been eliminated

11.3 Error codes


Tab.21 Warning errors

Code	Description	Solution
A.00.34	Outdoor temperature sensor was expected but not detected	Outdoor sensor is not connected: Connect the sensor
A.00.74	Buffer Tank temperature sensor was expected but not detected	Check the sensor's connection
A.00.75	Buffer Tank Top temperature sensor was expected but not detected	Check the sensor's connection
A.00.78	Cascade Flow temperature sensor was expected but not detected	Check the sensor's connection
A.00.102	Cascade return temperature sensor missing	Check the sensor's connection
A.08.26	The battery of the device is low or missing and must be replaced	Replace the battery on CLK-01
A.21.08	A connected producer of the boiler cascade reports a lock-out error	Inspect the detailed error-message on the affected boiler
A.21.09	A connected producer of the heat pump reports a lock-out error	Inspect the detailed error message on the affected heat pump

Tab.22 Blocking errors

Code	Description	Solution
H.06.70	None critical failure occurred on the outdoor unit	 See Heat pump documentation.
H.06.82	Oil preheating ongoing Normal operation will begin 6 hours after first startup of outdoor unit	Wait 6 hours until crank case heater is done.
H.06.83	Communication error between the controller board and the interface board	<ul style="list-style-type: none"> • Check Modbus wiring. • Check Modbus if settings on GTW-251 are 9600 kB, parity none. • Check Modbus settings on heat pump. •

Tab.23 Lock-out errors

Code	Description	Solution
E.06.71	Critical failure occurred on the outdoor unit	 See Heat pump documentation.

12 Disposal



Important

The appliance should not be disposed of with normal household waste.

Dispose of the appliance in accordance with local and national regulations.

12.1 Disposal and recycling

The appliance is composed of multiple components made from various different materials, such as steel, copper, plastic, fibreglass, aluminium, rubber, etc.

DISMANTLING AND DISPOSAL OF THE APPLIANCE (WEEE)

After being dismantled, this appliance must not be disposed of as mixed urban waste.

This type of waste must be sorted so that the materials that make up the appliance can be recovered and reused.

Contact your local government for more information on the recycling systems available.

Incorrect waste management may have potentially negative effects on the environment and human health.

When old appliances are replaced with new ones, the seller is legally bound to remove the old appliance and dispose of it free of charge.


The  symbol, on the appliance, shows that it is prohibited for the product to be disposed of as mixed urban waste.

Fig.102 Recycling



Warning

The appliance must be removed and disposed of by a qualified installer in accordance with the local and national regulations.

12.2 Disposal and recycling



MW-1002249-1

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