

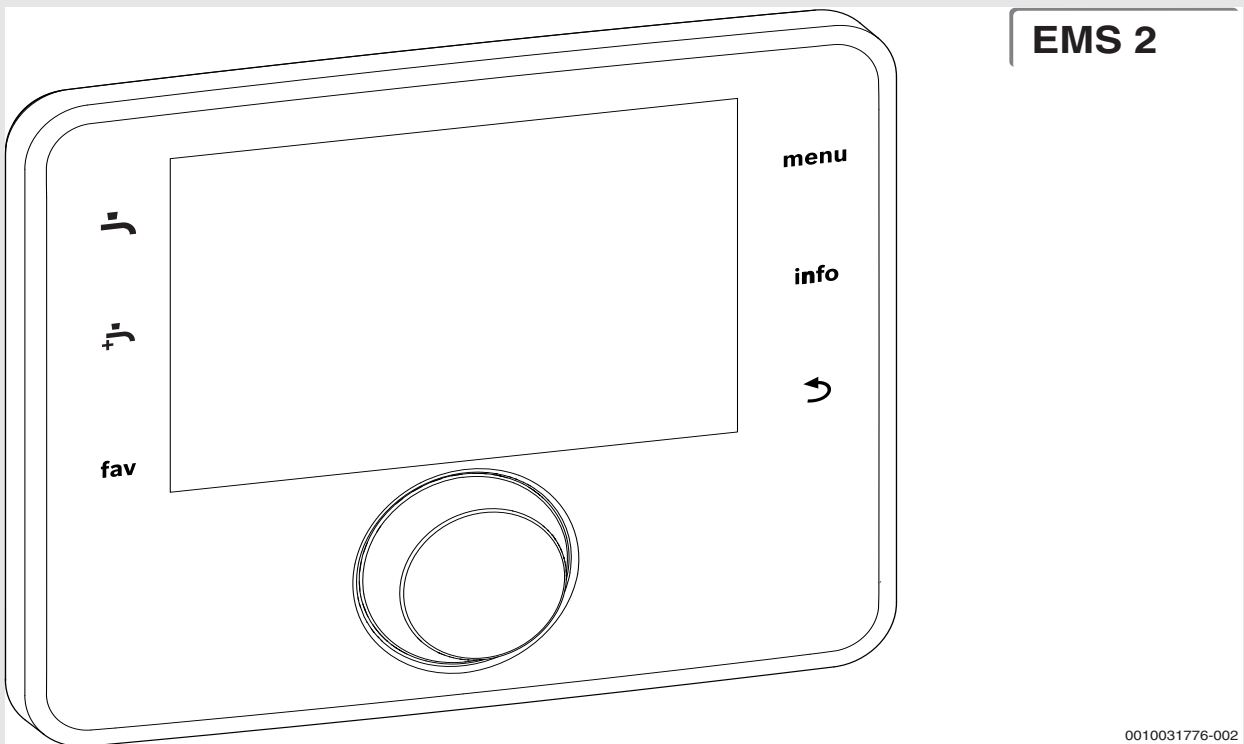


BOSCH

Installation instructions for contractors

User interface

HPC 410



0010031776-002



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1 Explanation of symbols and safety instructions

1.1 Explanation of symbols

Warnings

In warnings, signal words at the beginning of a warning are used to indicate the type and seriousness of the ensuing risk if measures for minimizing danger are not taken.

The following signal words are defined and can be used in this document:



DANGER indicates that severe or life-threatening personal injury will occur.



WARNING indicates that severe to life-threatening personal injury may occur.



CAUTION indicates that minor to medium personal injury may occur.

NOTICE

NOTICE indicates that material damage may occur.

Important information



The info symbol indicates important information where there is no risk to people or property.

1.2 General safety instructions

Notice for the target group

These installation instructions are intended for plumbers, heating engineers and electricians. All instructions must be observed. Failure to comply with instructions may result in material damage and personal injury, including possible loss of life.

- ▶ Read the installation instructions (heat source, heating controller, etc.) before installation.
- ▶ Observe the safety instructions and warnings.
- ▶ Observe national and regional regulations, technical rules and guidelines.

Determined use

- ▶ Use the product only to control heating systems.


Any other use is considered inappropriate. We take no responsibility for damage caused through incorrect use.

2 Product information

This is an original manual. This manual may not be translated without the approval of the manufacturer.

2.1 Declaration of conformity

The design and operating characteristics of this product comply with the European and national requirements.

 The CE marking declares that the product complies with all the applicable EU legislation, which is stipulated by attaching this marking.

The complete text of the Declaration of Conformity is available on the Internet: worcester-bosch.co.uk

2.2 Product Description

The user interface HPC 410 controls max. 4 heating/cooling¹⁾ circuits individually and a cylinder primary circuit for DHW heating, solar DHW heating and solar central heating backup.

- The user interface incorporates a time program:
 - Heating systems: For each heating circuit, 2 time programs with 2 switching times per day.
 - Domestic hot water: One time program for DHW heating and one time program for the DHW circulation pump, each with 6 switching times per day.
- Certain menu items are specific to certain countries and are only displayed if the country in which the heat pump is installed has been set accordingly.

The functional scope and thus the menu structure of the user interface are determined by the structure of the system. The adjustment ranges, default settings and functional scope may differ from the information in these instructions, depending on the system installed at the site.

Depending on the software version of the control unit, the texts shown in the display may differ from the texts in this manual.

- If 2 or more heating/cooling¹⁾ circuits are installed, settings for each heating/cooling¹⁾ circuit is available and are necessary.
- If special system components and modules are installed (e.g. MS 200 solar module, pool module MP 100), corresponding settings are available and necessary.

Control modes

The following main control modes are available for the heating system:

- **Outdoor-temp.-compensated**
 - the flow temperature is adjusted based on the outside temperature according to an optimised heating curve.
- **Outdoor-temp.-compensated with low end**
 - the flow temperature is adjusted based on the outside temperature according to a simplified heating curve.

For both of the control modes a room controller may be installed in the reference room to allow the influence of the measured and required room temperature. The heating curve is then adjusted accordingly.

If cooling is active, a set constant temperature is maintained.

2.3 Additional accessories

Function modules and user interfaces of the EMS 2 control system:

- **User interface CR10²⁾** as a simple remote room controller.
- **User interface CR10H** as a simple remote room controller with option to measure relative humidity (heating/cooling circuits).
- **MM 100**: module for one heating/cooling circuit with mixing valve.
- **MP 100²⁾**: module for a swimming pool.
- **MS 100²⁾**: module for solar DHW heating.

- **MS 200²⁾**: module for advanced solar systems.

Combination is not possible with the following products:

- FR..., FW..., TF..., TR..., TA...

3 Commissioning



WARNING

Risk of scalding!

As DHW temperatures above 60 °C can be reached when the customer activates the extra DHW function, a temperature mixing device must be installed.

NOTICE

Floor damage!

The floor may be damaged due to excessive heat.

- ▶ For underfloor heating systems, make sure that the maximum temperature for the floor type in question is not exceeded.
- ▶ If necessary, connect an additional temperature switch at the voltage input of the respective circulation pump and to one of the external inputs.

3.1 General commissioning of the user interface

1. Do proper coding of the modules (observe instructions of the modules).
2. Switch on the system.
3. Commission the remote room control (observe the operating instructions of the remote room control).
4. Once the user interface HPC 410 is connected to the power supply, the **Language** menu appears on the display. Make adjustments by turning and pressing the selector.
5. Set the language.
The display changes to the **Date** menu.
6. Set the date and confirm with **Next**.
The display changes to the **Time** menu.
7. Set the time and confirm with **Next**.
The display changes to the **Country information** menu.
8. Set the country and confirm.
The display changes to the **Buffer cyl.** menu.
9. Select **Yes** if a buffer cylinder is installed and confirm. Otherwise select **No** and confirm³⁾.
The display changes to the **Configuration wizard** menu.
10. Start the configuration wizard with **Yes** (or skip with **No**).
11. Check and, if necessary, adjust the settings in the service menu and perform configuration of specific modules (e.g. solar).
12. Remedy warning and fault displays, if necessary, and reset fault history.
13. Name heating circuits (→ operating instructions).
14. System handover (→ Chapter 3.6).

3.2 System commissioning with the configuration wizard

The configuration wizard automatically recognises which BUS nodes are installed in the system. The configuration wizard adjusts the menu and the factory defaults.

The system analysis may take up to one minute.

After the configuration wizard has performed the system analysis, the **Commissioning** menu is opened. The sub-menus and settings must

1) Cooling mode is not available in BE and DK.

2) This accessory is not available in IE and UK.

3) The buffer cylinder option is not available for Air/Water indoor units with integrated buffer cylinder (AWMB).

always be checked here and, if necessary, adjusted and finally confirmed.

If the system analysis is skipped, the **Commissioning** menu is opened directly. The sub-menus and settings listed here must be carefully adjusted according to the installed system. Finally, the settings must be confirmed.

Menu item	Control range: Function description
Country information	
	Set the country and confirm.
Buffer cyl.	
	Select [Yes] if a buffer cylinder is installed. Otherwise select [No] and confirm.
Start configuration wizard	
	[Yes] [No]: Please ensure before starting the configuration wizard: <ul style="list-style-type: none"> that all connected modules are installed and addressed. that an outdoor temperature sensor is installed.
Min. outside temp.	Set the design temperature for the system, DUT (Dimensioning outdoor temperature). This is the lowest average outdoor temperature for the region. The setting affects the slope of the heating curve as it is the point where the heat source reaches the highest flow temperature.
VCO valve connected	Set this if a 3-way valve is installed between the buffer cylinder and the heat pump/indoor unit.
Select add. heat appliance	[Not installed] [Electric booster heater in series]: this selection applies to the integrated electrical heater. [Additional heater with mixer only]: this selection applies to a mixed additional heater that only runs when the heat pump is off. [Add. heater with mixer in parallel]: this selection applies to a mixed additional heater that is allowed to run in parallel with the heat pump. [Hybrid]: this selection applies to an additional heater that is allowed to run instead of the heat pump based on the energy price settings.
Mixed aux. heat. conn	[230V] The mixed additional heater is controlled by on/off signal. [0-10V] The mixed additional heater is controlled based on power demand.
Heating circuit 1 installed	[On the heat appliance]: heating circuit 1 is connected directly to the heat pump/indoor unit. [On module]: heating circuit 1 is electrically connected to a mixing module. Buffer cylinder is required.
Config. HC1 at HP	[No HC1 on heat appliance]: no heating circuit connected to the heat source. [No own heating circuit pump]: heating circuit 1 is directly connected to the heat pump/indoor unit without heating circuit pump. [Via pump PC1]: heating circuit 1 is directly connected to the heat pump/indoor unit and equipped with a heating circuit pump.
Priority heating circuit 1	Select [Yes] if heating circuit 1 limits the heating supply to additional heating circuits. Otherwise select [No] and confirm.
Mixer heating circuit 1	[Yes] [No]: setting that defines whether heating circuit 1 is a heating circuit with mixer.

Menu item	Control range: Function description
Mixer runtime heat circ. 1	0 ... 600 s: setting that specifies the time required by the mixing valve in heating circuit 1 to turn from one stop to the other.
Heating system heat circ. 1	[Radiators] [Convector] [Floor]: setting for the type of heating distribution in the selected heating circuit.
Ctrl type h. circ. 1	[Outside temp.-compensated]: Weather-compensated flow temperature controlled by the outside temperature sensor. [Outside temp. with base point]: weather-compensated control, taking a base point into account.
Rem. ctr. heat. circuit 1	[None] [CR10] [CR10H]: selection of the corresponding remote room controller for the heating circuit.
	[Heating circuit 2 ... 4]: see [Heating circuit 1 installed], but only the first heating circuit can be directly connected to the heat source. All additional heating circuits must be mixed.
DHW install.	[No]: no DHW system installed. [Heat p.]: a DHW system is activated and connected directly to the heat pump, either by the integrated cylinder or externally by a 3-way valve. [Freshwa.]: a freshwater station is connected.
DHW circ.pump installed	[No] [Yes]: setting that specifies whether a DHW circulation pump is installed in the DHW system and controlled by the user interface. This menu is not shown if a freshwater station is installed.
Size of freshwater station	[15/20 l/min] [27 l/min] [40 l/min]: setting that specifies the size of the freshwater station.
Freshwater station 2...Freshwater station 4	[No]: no further freshwater station is connected. [MS100]: a freshwater extension station is connected.
Change freshwater configuration	Setting that specifies the configuration of the freshwater installation. Check and confirm that it corresponds with the system installed.
Ventilation installed	[No] [Yes]: setting that specifies whether or not a ventilation system is installed and controlled by the user interface.
Sol.therm.sys. instlId	[No] [Yes]: setting that specifies whether or not a solar thermal system is installed and controlled by the user interface.
Solar extension module	[No] [SM100]: setting that specifies whether or not a solar extension module is installed and controlled by the user interface.
Pool mixing valve	0 ... 600 s: if a mixing valve for a pool is installed and controlled by the user interface, set the time required by the valve to turn from one stop to the other.
Electr. anode in cylinder	[No] [Yes]: setting that specifies whether or not an electric anode is installed in the DHW cylinder.
Fuse size	[16A] [20A] [25A] [32A]: set the main fuse of the house dedicated to the heating appliance.
Confirming configuration	
	[Confirm: if all settings correspond to the installed system. [Back]: if changes are needed.

Table 1 Commissioning with the configuration wizard

3.3 Additional settings at commissioning

If corresponding functions are deactivated and modules, assemblies or components are not installed, menu items that are not required are disabled when continuing with additional settings.

Always remember to save all settings when the commissioning is done by confirming **Save all settings** in the service menu.

3.3.1 Important heating settings

In all cases, the settings in the heating menu must be checked and adjusted if necessary during commissioning. This is important to ensure the function of the heating system. It is useful to check all displayed settings.

- ▶ Check settings in the system data menu.
- ▶ Check settings in the menu for heating circuit 1 ... 4.
 - Set heating curve according to the requirements of the system.

3.3.2 Important settings for the DHW system

The settings in the DHW menu must be checked and, if necessary, adjusted during commissioning. This is important to make sure the DHW heating is working properly. Not applicable for hybrid systems with a central heating combi boiler.

3.3.3 Important setting for additional systems or devices

If other specific systems or devices are installed in the system, additional menu items will be available. This means that systems and devices are available, for example:

- Solar thermal system
- Hybrid system
- External booster heater
- Pool
- Ventilation

Observe the relevant technical documentation of the module, system or device to ensure proper function.

3.4 Performing function tests

The function tests can be accessed via the **Diagnosis** menu. The available menu items are strongly dependent on the system installed. Under this menu the following can be tested, for example: **DHW circ. pump: On/Off**.

3.5 Check monitored values

The monitored values can be accessed via the **Diagnosis** menu.

3.6 System handover

- ▶ Enter the contact details of the responsible contractor in the **Diagnosis > Maintenance > Contact addr.** menu, e.g. company name, phone number and address or e-mail address.
- ▶ Explain to the customer how the user interface and the accessories work and how to operate them.
- ▶ Inform the customer about the selected settings.

3.7 Shutdown / switching off

The user interface is powered via the BUS interface and is normally switched on. The system should only be shutdown for maintenance work, for example. The complete system is deactivated and there is no frost protection during a shutdown.

- ▶ To temporarily switch off the system:
 - Press and hold the selector until a pop-up menu is displayed.
 - Select **Yes** in the menu **Switch to standby mode?**
- ▶ To switch on the system:
 - Press and hold the selector until a pop-up menu is displayed.
 - Select **Yes** in the menu **Switch from standby mode to normal operation?**
- ▶ To permanently shutdown: Disconnect power from the entire system and all BUS nodes.



After a prolonged power failure or extended period of idleness, the date and time may need to be reset. All other settings are retained permanently.

3.8 Quick start of heat pump

- ▶ Open the service menu.
- ▶ Press and hold both the menu and info keys until a pop-up window appears on the display.
 - The quick start function raises the heating demand so that the heat pump starts as soon as possible.

4 Service menu

Service menu overview → Page 20.

- ▶ If the standard display is active, press and hold both the **selector** and the **menu** button for about three seconds until the menu **Service menu** is displayed.
- ▶ Turn the selector in order to select the desired menu item.
- ▶ Press the selector to open the selected menu item, activate the input field for a setting or confirm a setting.
- ▶ Press the **↶** button to cancel the current setting or exit the current menu item.



The default settings are **highlighted**.

4.1 Settings for the heat pump

4.1.1 Menu: Heat pump

Make the heat pump specific settings in this menu. These settings are only available if the system is designed and configured accordingly and the type of appliance used supports this setting.

Menu item	Control range: Function description
On/off hysteresis Only available for AW Split heat pumps.	<p>The heat pump switches between [On] or [Off] according to the set hysteresis. The hysteresis specifies by how many degrees and for how long time the actual value has to exceed or fall below the limit value before the switch is done. The range and default values varies depending on model of heat pump.</p> <p>[Set on/off hysteresis of split outdoor unit in heating mode.]: 50...1500 K x min</p> <p>The heat pump starts when the flow temperature has been below the set flow temperature for the set value. The heat pump stops when the flow temperature has been above the set flow temperature for the set value.</p> <p>[Set on/off hysteresis in cooling mode.]: 50...1500 K x min</p> <p>The heat pump stops when the flow temperature has been below the set flow temperature for the set value. The heat pump starts when the flow temperature has been above the set flow temperature for the set value.</p> <p>[Set on/off hysteresis in pool mode.]: 50...1500 K x min</p> <p>The heat pump stops when the flow temperature has been below the set flow temperature for the set value. The heat pump starts when the flow temperature has been above the set flow temperature for the set value.</p>
Stand-alone mode	<p>[Yes]: No heat pump installed. Heating and DHW produced solely by the additional heater/indoor unit.</p> <p>[No]: Normal operation. Heating and DHW produced by the heat pump and the additional heater/indoor unit.</p>

Menu item	Control range: Function description
Pumps	Make the circulation pump settings in this menu (→ Chapter 4.1.2).
External connections	If used, do the settings for external connections in this menu (→ Chapter 4.1.3).
Fuse size	If change needed after commissioning, set the main fuse size for the house.
Manual defrosting	[Yes]: The heat pump is forced to defrost the evaporator.
Smart grid	If used, do the settings for the smart grid in this menu (→ Chapter 4.1.4).
PV system	If used, do the settings for the PV system in this menu (→ Chapter 4.1.5).
Fixed temperature	Use this setting if a buffer cylinder with integrated DHW heating is installed. The heat pump will heat the cylinder to a set temperature independent of outdoor temperature. All heating circuits must be controlled by mixing valves.
Central fault	[All faults and messages]: All faults and messages indicated will be displayed. [Only faults]: Only faults indicated will be displayed.
Low-noise operation	[Silent mode on] <ul style="list-style-type: none"> [No]: The heat pump will always run in normal operation. [Auto]: The heat pump will run in low noise mode during the set time period. [On]: The heat pump will always run in low noise mode. If [Auto] is activated the heat pump will run in reduced sound operation during the set time period. <ul style="list-style-type: none"> [Low-noise operation of]: set the start time for the low noise operation. [Low-noise operation until]: set the stop time for the low noise operation. [Min. outside temp.]: Below this outdoor temperature the heat pump switches over to normal operation.

Table 2 Settings for the heat pump

4.1.2 Menu: Pumps

Make the circulation pump specific settings in this menu. These settings are only available if the system is designed and configured accordingly and the type of appliance used supports this setting.

Menu item	Control range: Function description
Prim. heating pump mode	[Automatic]: The primary circulation pump is in operation when any heat source is active. When all heat sources are off, the circulation pump is also off. [On]: The primary circulation pump is in operation continuously.
Minimum flow rate	The heat pump only starts once the minimum flow rate has been reached.
Flow rate detect.	[On]: activates the flow control. [Off]: deactivates the flow control.
Temp.diff. TC3/TCO Heat.	3...7...10 K: Set the permissible temperature differential between the heat pump flow and return in heating mode.
Temp.diff. TC3/TCO Cool.	2...3...10 K: Set the permissible temperature differential between the heat pump flow and return in cooling mode.

Table 3 Settings in the heat pump data menu

4.1.3 Menu: External connections

Make the specific settings for each external connection in this menu. Multiple settings is possible in each menu.



The **ESC blocking time1 on** menu items are only available in the **External connection 1** menu. If any of these items are set to "On" the smart grid function is automatically activated for **External connection 4** and no other settings can then be done in that menu.

Menu item	Control range: Function description
Logic ext. connection 1...4	[Closed (NO)]: Open contact is interpreted as On . [Open (NC)]: Closed contact is interpreted as On .
	[Block compr. operation]: An active signal on the external input blocks the compressor operation.
	[Block HW operation]: An active signal on the external input blocks the DHW operation.
	[Block heating mode]: An active signal on the external input blocks the heating operation.
	[Block cooling mode]: An active signal on the external input blocks the cooling operation.
	[Overheat. protection HC1]: An active signal on the external input blocks the heating operation and indicates a fault.
	[ESC blocking time1 on]: An active signal on the external input blocks compressor and additional heater operation.
	[ESC blocking time2 on]: An active signal on the external input blocks compressor operation.
	[ESC blocking time3 on]: An active signal on the external input blocks additional heater operation.
	[Block additional heater]: An active signal on the external input blocks additional heater operation.
	[PV system]: An active signal on the external input indicates that there are photovoltaic energy available. Heating and DHW temperatures will be adjusted according to the settings made in the [PV system] menu.

Table 4 Settings in the heat pump data menu

4.1.4 Menu: Smart grid

Make the Smart Grid specific settings in this menu. Select if the available energy should be used for Heating or DHW. These settings are only available if the system is designed and configured accordingly and the type of appliance used supports this setting.



If smart grid energy is available and a buffer cylinder is installed with all heating circuits mixed, the buffer cylinder will be heated to the heat pump maximum temperature.

Menu item	Control range: Function description
Heating	The energy available in the smart grid is used for heating, if the system is in heating mode. [Selectable peak]: 0...5 K Set how much the room temperature may be increased. [Forced peak]: 2...5 K Set how much the room temperature is forced to increase.
DHW	The energy available in the smart grid is used for DHW. [Selectable peak]: [Yes] [No] If enabled the DHW is heated to the temperature set for DHW operating mode [DHW comfort]. No heating is done if the holiday program is active.

Table 5 Settings in the smart grid data menu

4.1.5 Menu: PV system

Make the photovoltaic (PV) specific settings in this menu. Select if the available energy should be used for Heating or DHW. These settings are only available if the system is designed and configured accordingly and the type of appliance used supports this setting.



If photovoltaic energy is available and a buffer cylinder is installed with all heating circuits mixed, the buffer cylinder will be heated to the heat pump maximum temperature.

Menu item	Control range: Function description
Heating peak	The energy available in the PV system is used for heating, if the system is in heating mode. 0...5 K Set how much the room temperature may be increased.
DHW peak	The energy available in the PV system is used for DHW. [Yes] [No] If enabled the DHW is heated to the temperature set for DHW operating mode [DHW comfort]. No heating is done if the holiday program is active.
Cooling setback mode	If [Only cool with PV] is set to [Yes]: set how many degrees the heat pump is allowed to lower the indoor temperature.
Only cool with PV	Cooling mode is activated only if energy is available in the PV system. [Yes] [No] No cooling is done if the holiday program is active.

Table 6 Settings in the PV system data menu

4.2 Additional heater settings

4.2.1 Menu: Set additional heater

Make the additional heater general settings in this menu. These settings are only available if the system is designed and configured accordingly and the type of appliance used supports this setting.

Menu item	Control range: Function description
Gen. additional heater settings	These settings are valid for all types of additional heaters. [Additional heater on delay]: 10...300...1000 K x min The additional heater is switched on after a set delay. The delay is depending on time and deviation from desired flow temperature. [Mode after EVU block]: [Comfort]: The heat pump is allowed to start immediately after the blocking period. [ECO]: The heat pump is allowed start with a delay after the blocking period. [Auxiliary heater only]: [Yes] [No]: This setting specifies whether the additional heater should be the only heat source or not. [Switch off add. heater]: [Yes] [No]: This setting specifies whether the heat pump should be the only heat source or not. If blocking is selected the additional heater will still be available during extra DHW, thermal disinfection or alarm operation. [Max. add. heater temp.]: This setting specifies whether the additional heater should be blocked or limited while the heat pump is running close to its maximum flow temperature. The setting is activated by selecting and setting the offset. [Maximum limit]: Below this offset from the flow temperature the additional heater is blocked. [Limit start]: Below this offset from the flow temperature the additional heater is limited.

Table 7 Settings in the additional heater data menu

4.2.2 Menu: Electric auxiliary heater

Make the electric additional heater specific settings in this menu. These settings are only available if the system is designed and configured accordingly and the type of appliance used supports this setting.

Menu item	Control range: Function description
Lim. with compressor	[0...Maximum output of installed electric heater]. During compressor operation the electric additional heater output is limited to the set value.
Limit add. heater output	[0...Maximum output of installed electric heater]. During electric additional heater operation without compressor, the output is limited to the set value.
Limit DHW mode output	[0...Maximum output of installed electric heater]. During DHW heating the electric additional heater output is limited to the set value. The setting cannot be greater than the value set in [Limit add. heater output].
Outdoor temp. limit ¹⁾	[-20...20] °C: The electric additional heater is allowed to start below the set outdoor temperature.
Bivalence point ²⁾	

1) Not available if Germany is set as country.

2) Only available if Germany is set as country.

Table 8 Settings in the electric additional heater data menu

4.2.3 Menu: Auxiliary heater with mixer

Make the mixed auxiliary heater specific settings in this menu. These settings are only available if the system is designed and configured accordingly and the type of appliance used supports this setting.

Menu item	Control range: Function description
Mixed aux. heat. conn	[230V] The mixed additional heater is controlled by on/off signal. [0-10V] The mixed additional heater is controlled based on power demand.
Delay time for mixer	[0...120] min: Set the delay for opening of the mixing valve to allow the auxiliary heater to preheat.
Mixer run time	[1...120...6000] s: Set the runtime for the mixing valve to go from one end point to the other.
Alarm input logic	[Open contact] [Closed contact]: Set if the auxiliary heater has a "NO" or "NC" output for the alarm.
Outs. temp par. mode ¹⁾	[-20...20] °C: The auxiliary heater is allowed to start in parallel operation below the set outdoor temperature.
Bival. pt. parallel mode ²⁾	
Outdr temp switch mod ¹⁾	[-20...20] °C: The auxiliary heater is allowed to start and the heat pump is blocked below the set outdoor temperature (Alternating operation).
Bival. pt. switch mode ²⁾	
Add. heater DHW cylinder	[Yes] [No]: Choose if the DHW cylinder has an electric additional heater installed.

- 1) Not available if Germany is set as country.
- 2) Only available if Germany is set as country.

Table 9 Settings in the auxiliary heater data menu

4.3 Heating settings

4.3.1 System data

Settings for the entire heating system can be made in this menu.

Menu item	Control range: Function description
Is a buffer cylinder installed?	[Yes] [No]: Set if a buffer cylinder is installed in the heating system.
Config. HC1 at HP	[No HC1 on heat appliance]: no heating circuit connected to the heat source.
	[No own heating circuit pump]: heating circuit 1 is directly connected to the heat pump/indoor unit without heating circuit pump.
	[Via pump PC1]: heating circuit 1 is directly connected to the heat pump/indoor unit and equipped with a heating circuit pump.
Internal heating pump	[Heating pump]: the internal heat source pump also serves as heating pump in heating circuit 1.
Min. outside temp.	Set the design temperature for the system, DUT (Dimensioning outdoor temperature). This is the lowest average outdoor temperature for the region. The setting affects the slope of the heating curve as it is the point where the heat source reaches the highest flow temperature.
Damping ¹⁾	[Yes]: the set building type affects the measurement of the outside temperature. The outside temperature is delayed (adjusted).
	[No]: the measured outside temperature is included unadjusted in the weather-compensated control.
Building type	Measure of the thermal storage capacity of the heated building.

- 1) To get a more responsive regulation it is recommended to choose "No".

Table 10 Settings in the system data menu

Building type

If damping is activated, the outside temperature fluctuations are damped with the building type. By damping the outside temperature, the thermal inertia of the building mass is taken into account in the weather-compensated control.

Adjustment	Function definition
Heavy (high storage capacity)	Type E.g. brick house
	Effect <ul style="list-style-type: none"> • Intense damping of the outside temperature • Long excessive increase in flow temperature with quick heat-up
Medium (medium storage capacity)	Type e.g. house made of hollow blocks (default setting)
	Effect <ul style="list-style-type: none"> • Medium damping of the outside temperature • Excessive increase in flow temperature with quick heat-up of medium duration
Light (low storage capacity)	Type e.g. prefabricated building, beam and column construction, timber frame construction
	Effect <ul style="list-style-type: none"> • Slight damping of the outside temperature • Short excessive increase in flow temperature with quick heat-up

Table 11 Settings for the menu item Building type

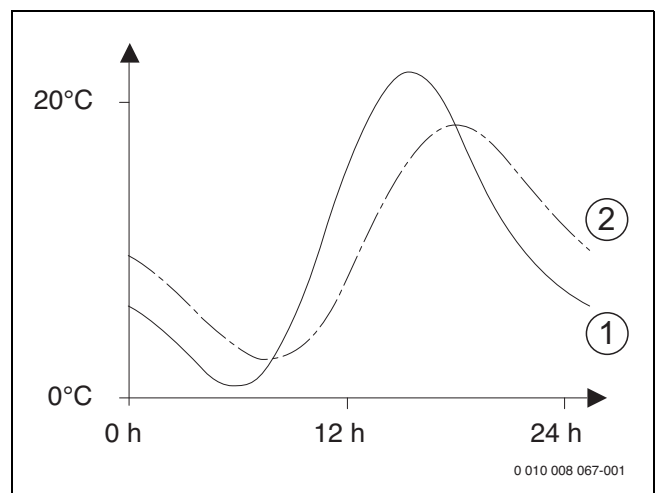


Fig. 1 Example for adjusted outside temperature:

- [1] Actual outside temperature
- [2] Adjusted outside temperature



In the default setting any changes in the outside temperature have an effect after a delay of three hours at the latest on the calculation of the weather-compensated control.

- To view the course of the outside temperature of the last 2 days: open the menu **Info > Outdoor temp.**

4.3.2 Menu Priority heating circuit 1

Make the heating priority settings in this menu. The settings are only available if more than one heating circuit is installed.

Menu item	Control range: Function description
Priority heating circuit 1	<p>[Yes]: Heating circuit 1 has priority and all additional heating circuits are restricted by the requirements of heating circuit 1. Any additional heating circuit will only be heated if heating circuit 1 is heated. The maximum flow temperature of all heating circuits is limited to the flow temperature of heating circuit 1.</p> <p>[No]: If any additional heating circuit is heated, the unmixed heating circuit 1 is also heated. Heating circuit 1 will get the same flow temperature as the highest flow temperature of the additional heating circuits.</p>

Table 12 Settings in the Priority heating 1 menu

4.3.3 Menu heating circuit 1 ... 4

Make the settings for the selected heating circuit in this menu.

NOTICE

Risk of damaging or destroying the screed!

- If an underfloor heating system is installed, observe the maximum flow temperature recommended by the manufacturer.

Menu item	Adjustment range
Heating circuit installed	<p>[No]: heating circuit is not installed. If no heating circuit is installed, the heat source is only used for DHW heating.</p> <p>[On the heat appliance]: electrical assemblies and components of the selected heating circuit are directly connected to the heat source (only available with heating circuit 1).</p> <p>[On module]: electrical assemblies and components of the selected heating circuit are connected to a MM 100/ module.</p>
Remote ctrl	<p>[HPC 410]: HPC 410 controls the selected heating circuit without remote control.</p> <p>[CR10]: CR10 is installed as remote control for the selected heating circuit.</p> <p>[CR10H]: CR10H is installed as remote control for the selected heating circuit.</p>
Heating system	[Radiators] [Convector] [Floor]: factory default of the heating curve according to heating type, e.g. curvature and design temperature.
Heating circuit function	<p>[Heating and cooling]: The selected circuit is used for both heating and cooling.</p> <p>[Cooling only]: The selected circuit is only used for cooling.</p>
Control type	<p>[Outside temp. -compensated]: The flow temperature is adjusted based on the outside temperature according to an optimised heating curve.</p> <p>[Outside temp. with base point]: The flow temperature is adjusted based on the outside temperature according to a simplified heating curve.</p>
Set heating curve	Fine adjustment of the heating curve that is present in the heating system (→ "Menu for setting of the heating curve").
Constant heat below	<p>[Off]: the heating system operates independently of the adjusted outside temperature in the active operating mode (→ "Heat constantly below a certain outside temperature").</p> <p>[- 30 ... 10] °C: if the adjusted outside temperature falls below the value set here, the heating system automatically changes from the setback mode to the heating mode (→ "Heat constantly below a certain outside temperature").</p>

Menu item	Adjustment range
Frost prot.	<p>Notice: to ensure frost protection for the entire heating system, set outside temperature-dependent frost protection. This setting is independent of the set control type.</p> <p>[Outdoor temp] [Room] [Room and outside temp.]: frost protection is deactivated/activated on the basis of the temperature selected here (→ "Frost protection limit temperature (outside temperature threshold)").</p> <p>[Off]: frost protection off.</p>
Frost prot. limit temp.	[- 20 ... 5 ... 10] °C: → "Frost protection limit temperature (outside temperature threshold)".
Sum./winter changeover	<p>[Permanently summer]: The heat pump and the additional heater is only active in DHW mode. The heating circuits is in summer mode (no heating).</p> <p>[Automatic mode]: The system automatically switches between heating or cooling mode depending on the outdoor temperature.</p> <p>[Permanent heating]: The heat pump and the additional heater is active in heating and DHW mode, cooling mode is not allowed. The heating circuits is in heating mode.</p> <p>[Permanent cooling]: The heat pump is active in cooling and DHW mode. The heating circuits is in cooling mode.</p>
Summer mode from	[10... 17... 30] °C: Set the outside temperature threshold to activate the heating mode.
Heating direct start limit	[0... 1... 10] K: Set limit for direct start of heating mode. If the outside temperature falls below the [Summer mode from] temperature with this offset, heating is immediately activated.
Cooling switch-off delay	[1...4...48] h: Set the cooling mode switch-off delay. The timer activates when the outdoor temperature falls below the threshold temperature.
Cooling switch-on delay	[1...8...48] h: Set the cooling mode switch-on delay. The timer activates when the outdoor temperature raises over the threshold temperature.
Heating switch-off delay	[1...1...48] h: Set the heating mode switch-off delay. The timer activates when the outdoor temperature raises over the threshold temperature.
Heating switch-on delay	[1...4...48] h: Set the heating mode switch-on is delay. The timer activates when the outdoor temperature falls below the threshold temperature.
Room temp. switch. diff.	[-5...2...5] K: Cooling mode is activated if the set room temperature is exceeded with the amount set here (e.g. for 2 K: set room temperature = 23 °C; actual room temperature = 25 °C – cooling is activated).
Dew point temp. diff.	[2...5...10] K: Set the safety margin to the calculated dew point. The controller will keep the set flow temperature above the calculated dew point with this value.
Min. set flow temperature	<p>[7...10...35] °C: Minimum set flow temperature for the heating/cooling circuit if the system and the appliance is designed for condensing cooling.</p> <p>[7...17...35] °C: Minimum set flow temperature for the heating/cooling circuit when it is used for non-condensing cooling.</p>
Mixer	<p>[Yes]: the selected heating circuit is with mixing valve.</p> <p>[No]: the selected heating circuit is without mixing valve.</p>
Mixer run time	[10 ... 120 ... 600] s: elapsed time of mixing valve in the selected heating circuit.

Menu item	Adjustment range
Shown in standard display	[Yes]: the selected heating circuit is visible in the standard display.
	[No]: the selected heating circuit is not visible in the standard display.
Detection low flow rate	[On]: the low flow detection is activated for the selected heating circuit. [Off]: the low flow detection is deactivated for the selected heating circuit.

Table 13 Check settings in the menu for heating circuit 1 ... 4

Set the heating system and heating curves for weather-compensated control

- ▶ Set the heating type (radiator, convector or underfloor heating system) in the menu **Set heating/cooling > Heating circuit 1 ... 4 > Heating system heat circ. 1.**
- ▶ Set the control type (weather-compensated or weather-compensated with base point) in the menu **Ctrl type h. circ. 1.** Menu items that are not required for the selected heating system and control type are switched off in the display. The settings only apply for the selected heating circuit, if available.

Menu for setting of the heating curve

Menu item	Adjustment range
Design temperature or End point	30 ... 75 ... 85 °C (radiator/convector)/ 30 ... 45 ... 85 °C (underfloor heating system): The design temperature is only available with weather-compensated control without base point. The design temperature is the flow temperature that is reached at the minimum outside temperature and therefore affects the steepness/inclination of the heating curve. The end point is only available with weather-compensated control with base point. The end point is the flow temperature reached when the outside temperature is at the minimum and, thus, affects the steepness/inclination of the heating curve. When the base point is set higher than 30°C, the base point is the minimum value.
Base line	e.g. 20 ... 25 °C ... End point: the base point of the heating curve is only available with weather-compensated control with a simple heating curve.
Max. flow temperature	30 ... 75 ... 85 °C (radiator/convector)/ 30 ... 48 ... 60 °C (underfloor heating system): Setting for maximum flow temperature.
Solar effect	- 5 ... - 1 K: within certain limits, the solar irradiation influences the weather-compensated control (the additional heat from the sun lowers the required heat output). Off : the solar irradiation is not considered by the control.
Room influence	Off : the weather-compensated control operates independently of the room temperature. 1 ... 10 K: Deviations in the room temperature to the extent set are set off by parallel displacement of the heating curve (only available if a remote control is installed in a suitable reference room). The higher the setting value, the greater the weighting of the room temperature deviation and the maximum possible influence of the room temperature on the heating curve.
Room temperature offset	- 10 ... 0 ... 10 K: parallel displacement of the heating curve (e.g. when the room temperature measured with a thermometer deviates from the set value)

Table 14 Set heating curve menu

Default heating curve

The default heating curve is curved upward and is based on the precise correspondence of the flow temperature to the relevant outside temperature.

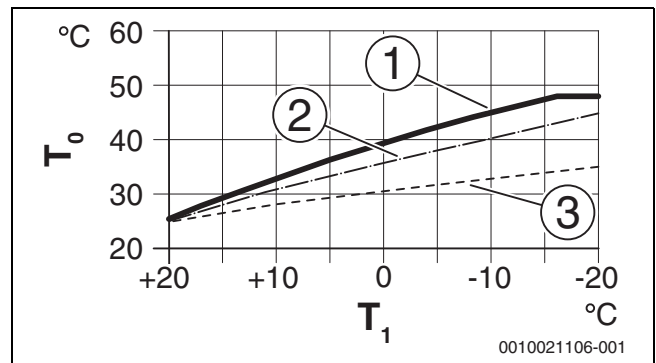


Fig. 2 Setting of the heating curve for underfloor heating system Gradient via design temperature T_0 and minimum outside temperature $T_{1,min}$

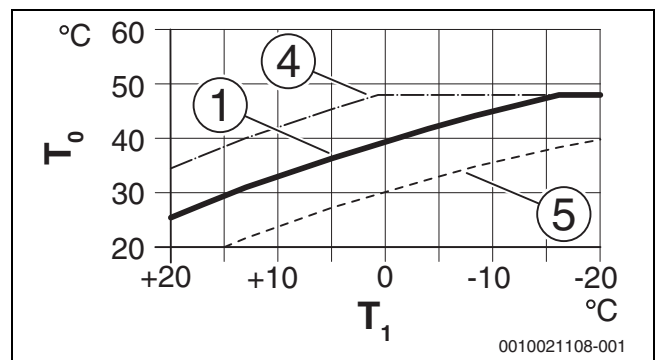


Fig. 3 Setting the heating curve for underfloor heating system Parallel shift above with Room temperature offset or required room temperature

- T_1 Outdoor Temperature
- T_0 Flow temperature
- [1] Setting: $T_0 = 45$ °C, $T_{1,min} = -10$ °C (base curve), limit at $T_{0,max} = 48$ °C
- [2] Setting: $T_0 = 40$ °C, $T_{1,min} = -10$ °C
- [3] Setting: $T_0 = 35$ °C, $T_{1,min} = -20$ °C
- [4] Parallel displacement of the base curve [1] by changing the offset by +3 or by increasing the desired room temperature, limit at $T_{0,max} = 48$ °C
- [5] Parallel displacement of the base curve [1] by changing offset by -3 or by reducing the desired room temperature

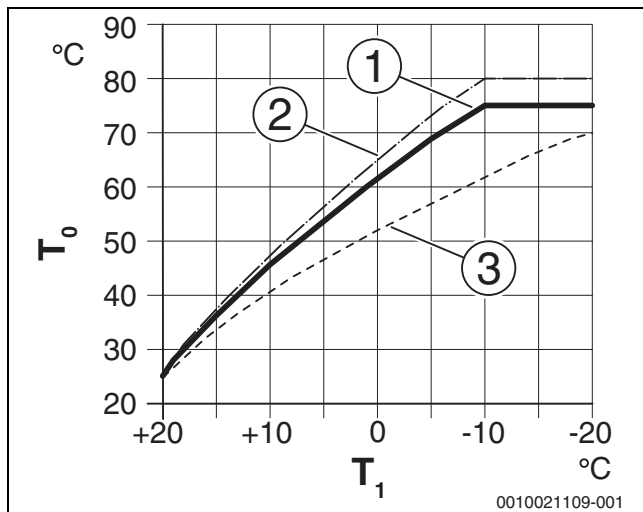


Fig. 4 Setting of the heating curve for radiators
Gradient via design temperature T_0 and minimum outside temperature T_{1min}

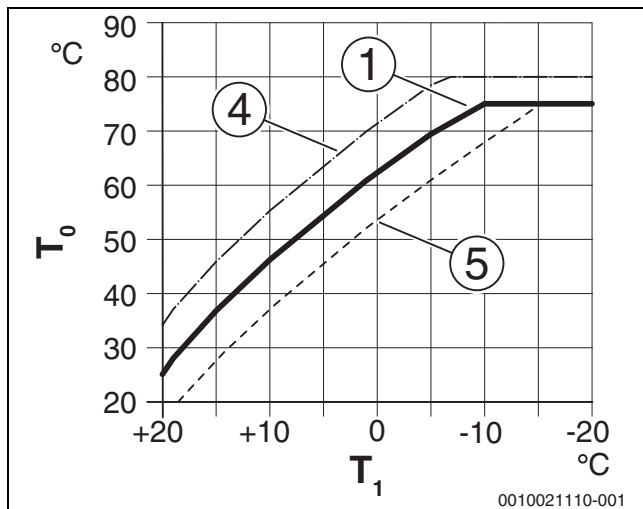


Fig. 5 Setting the heating curve for radiators
Parallel shift above Room temperature offset or required room temperature

- T_1 Outdoor Temperature
- T_0 Flow temperature
- [1] Setting: $T_0 = 75\text{ °C}$, $T_{1,min} = -10\text{ °C}$ (base curve), limit at $T_{0,max} = 75\text{ °C}$
- [2] Setting: $T_0 = 80\text{ °C}$, $T_{1,min} = -10\text{ °C}$, limit at $T_{0,max} = 80\text{ °C}$
- [3] Setting: $T_0 = 70\text{ °C}$, $T_{1,min} = -20\text{ °C}$
- [4] Parallel displacement of the base curve [1] by changing the offset by +3 or by increasing the desired room temperature, limit at $T_{0,max} = 80\text{ °C}$
- [5] Parallel displacement of the base curve [1] by changing the offset -3 or by reducing the desired room temperature, limit at $T_{0,max} = 75\text{ °C}$

Simple heating curve

The simple heating curve (**Ctrl type h. circ. 1: Outside temp. with base point**) is represented by a straight line. This straight line is described by two points: the base point (starting point of the heating curve) and the end point.

	Underfloor heating system	Radiator
Minimum outside temperature $T_{1,min}$	- 10 °C	- 10 °C
Base point	25 °C	25 °C

	Underfloor heating system	Radiator
End point	45 °C	60 °C
Maximum flow temperature $T_{0,max}$	48 °C	75 °C
Room temperature offset	0.0 K	0.0 K

Table 15 Basic settings of the simple heating curve

Heat constantly below a certain outside temperature

To prevent the system from cooling down, DIN-EN 12831 requires that, for the maintaining of a comfortable heat, all heating surfaces and heat sources are designed to a defined output. If the adjusted outside temperature set under **Constant heat below** is undercut, the active setback mode is interrupted by normal heating mode.

For example, if the settings **Setback: Heating off** : 5 °C and **Constant heat below** : -15 °C are active, the setback mode is activated when the adjusted outside temperature is between 5 °C and -15 °C and the heating mode is activated below -15 °C. This allows smaller heat emitters to be utilised.

Frost protection limit temperature (outside temperature threshold)

Under this menu item the limit temperature for the frost protection (outside temperature threshold) is set. It is only effective if **Frost prot., Outdoor temp** or **Room and outside temp.** is set in the menu.

NOTICE

Domestic hot water carrying parts may be damaged beyond repair if the frost protection limit temperature is set too low and in prolonged periods with outside temperature below 0 °C.

- ▶ Only contractors are permitted to adjust the factory setting of the frost protection limit temperature (5 °C).
- ▶ Do not set the frost protection limit temperature too low. Damage caused by a low frost protection limit temperature is not covered by the warranty.
- ▶ Set frost protection limit temperature and frost protection for all heating circuits.
- ▶ To ensure frost protection for the entire heating system, set either **Outdoor temp** or **Room and outside temp.** in the **Frost prot.** menu.



The setting **Room temperature** does not offer absolute frost protection, because pipework installed in façades, for instance, can freeze. If an outside temperature sensor is installed on the other hand, frost protection can be assured for the entire heating system regardless of the control type set.

4.3.4 Screed drying menu

This menu is only available if at least one under floor heating circuit is installed in the system and adjusted.

A screed drying program is set for the selected heating circuit or the entire heating system in this menu. To dry a new screed the heating system automatically runs the screed drying program once.

In case of a voltage failure the user interface automatically continues with the screed drying program. The voltage failure, however, must not last longer than the power reserve of the user interface or the maximum interruption duration.

NOTICE

Risk of damaging or destroying the screed!

- ▶ With multi-circuit systems, this function can only be used in combination with a heating circuit with mixer.
- ▶ Set the screed drying according to the instructions of the screed manufacturer.
- ▶ In spite of the screed drying function, visit the systems daily and keep the prescribed record.

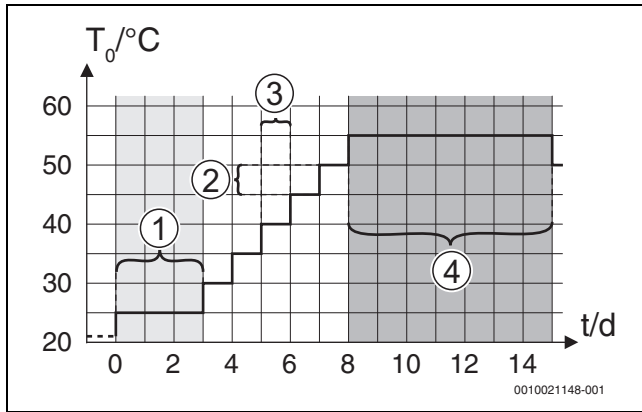


Fig. 6 Screed drying process with default settings in the heat-up phase

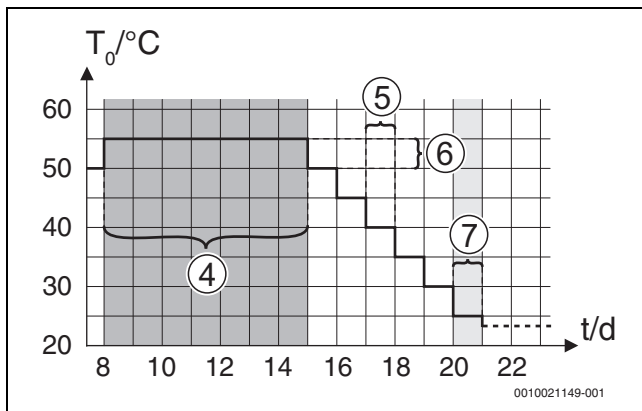


Fig. 7 Screed drying process with default settings in the cooling phase

Key to Fig. 6 and Fig. 7:

- T_0 Supply temperature
- t Time (in days)

Menu item	Control range: Function description
Activated	[Yes]: the required settings for the screed drying are displayed. [No]: the screed drying is not active and the settings are not displayed (default setting).
Wait time before start	[No wait time]: the screed drying program starts immediately for the selected heating circuits. [1 ... 50] days: the screed drying program starts after the set waiting time. The selected heating circuits are switched off during the waiting time, the frost protection is active (→ Fig. 6, time before day 0)
Start phase period	[No start phase]: no start phase. [1 ... 3 ... 30] days: setting for the time delay between the beginning of the start phase and the next phase (→ Fig. 6, [1]).
Start phase temp.	[20 ... 25 ... 55] °C: flow temperature during the start phase (→ Fig. 6, [1])

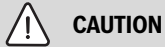
Menu item	Control range: Function description
Heat-up phase increment	[No heat-up phase]: no heat-up phase takes place. [1 ... 10] days: setting for the time delay between the steps (increment) in the heat-up phase (→ Fig. 6, [3])
Ht-up phase temp. diff.	[1 ... 5 ... 35] K: temperature differential between the steps in the heat-up phase (→ Fig. 6, [2])
Holding phase period	[1 ... 7 ... 99] days: time delay between the beginning of the holding phase (duration of the maximum temperature for screed drying) and the next phase (→ Fig. 6, [4])
Holding phase temp.	[20 ... 55] °C: flow temperature during the holding phase (maximum temperature, → Fig. 6, [4])
Cool-down phase incr.	[No cool-down phase]: no cooling phase takes place. [1 ... 10] days: setting for the time delay between the steps (increment) in the cooling phase (→ Fig. 7, [5]).
Cool-down ph. temp. diff.	[1 ... 5 ... 35] K: temperature differential between the steps in the cooling phase (→ Fig. 7, [6]).
End phase period	[No end phase]: no end phase takes place. [Perm.]: an end time is not defined for the end phase. [1 ... 30] days: setting for the time delay between the beginning of the end phase (last temperature step) and the end of the screed drying program (→ Fig. 7, [7]).
End phase temp.	[20 ... 25 ... 55] °C: flow temperature during end phase (→ Fig. 7, [7]).
Max. interruption time	[2 ... 12 ... 24] h: maximum duration of a screed drying interruption (e.g. by stopping the screed drying or power failure) until a fault display is output.
Screed dry. System	[Yes]: screed drying is active for all heating circuits of the system. Notice: single heating circuits cannot be selected. DHW heating is not possible. The display of menus and menu items with settings for DHW is switched off. [No]: screed drying is not active for all heating circuits. Notice: single heating circuits can be selected. DHW heating is possible. The menus and menu items with settings for DHW are enabled.
Screed dry. HC 1 ... Screed dry. HC 4	[Yes] [No]: setting that specifies whether screed drying in the selected heating circuit is active/not active.
Start	[Yes]: start screed drying now. [No]: screed drying not yet started or terminated.
Interrupt	[Yes] [No]: setting that specifies whether or not the screed drying is to be provisionally halted. If the maximum interruption duration has been exceeded, a fault display is output.
Continue	[Yes] [No]: setting that specifies whether or not screed drying is to be resumed once it has been halted.

Table 16 Settings in the Screed drying menu (Figs. 6 and 7 show the default setting of the screed drying program)

4.4 DHW settings

General DHW settings

The settings of the DHW systems can be adapted in this menu. These settings are only available if the system is designed and configured accordingly. Default temperature settings depend on the installed heat source.



Risk of scalding!

The maximum DHW temperature can be set above 60 °C and during thermal disinfection the DHW is heated to above 60 °C.

- Inform all people concerned and make sure that a mixing device is installed.



The DHW system is activated by default at delivery.

- If no DHW system is installed, deactivate DHW system in the commissioning or in the DHW menu.

Perform thermal disinfection to kill off pathogens (e.g. legionella) on a regular basis. In the case of larger DHW systems, there may be statutory requirements for thermal disinfection.

DHW settings menu

Menu item	Control range: Function description
DHW operation energy manager	[Switch-on temp. EM]: Set the switch on DHW-temperature from the energy management system. [Switch-off temperature EM]: Set the switch-off DHW-temperature from the energy management system.
DHW comfort	[Switch-on temperature] [15... 65] °C: start (minimum) temperature for the DHW in comfort mode (depending on the installed heat source). [Switch-off temperature] [15... 65] °C: stop (maximum) temperature for the DHW in comfort mode (depending on the installed heat source). [Ramp-up delay] [4... 10...36] h: Start delay for the DHW mode.
DHW Eco	[Switch-on temperature] [15... 65] °C: start (minimum) temperature for the DHW in Eco mode (depending on the installed heat source). [Switch-off temperature] [15... 65] °C: stop (maximum) temperature for the DHW in Eco mode (depending on the installed heat source). [Ramp-up delay] [4... 30...36] h: Start delay for the DHW mode.
DHW Eco+	[Switch-on temperature] [15... 65] °C: start (minimum) temperature for the DHW in Eco+ mode (depending on the installed heat source). [Switch-off temperature] [15... 65] °C: stop (maximum) temperature for the DHW in Eco+ mode (depending on the installed heat source). [Ramp-up delay] [4... 48...50] h: Start delay for the DHW mode.
DHW circ. pump	[DHW circ.pump installed]: if a DHW circulation pump is installed and to be controlled by the heat source, the DHW circulation pump must be activated here as well. [Off]: the DHW circulation pump cannot be controlled by the heat source.

Menu item	Control range: Function description
Circulation oper. mode	[Off]: circulation off. [On]: circulation permanently on (by taking the start frequency into account). [As DHW system]: Activate the same time program for circulation as for DHW heating. Further information and settings of the customised time program (→ user interface operating instructions). [Own time program]: activate customised time program for circulation. Further information and settings of the customised time program (→ user interface operating instructions).
DHW circ. start freq.	If the DHW circulation pump is active via the time program for the DHW circulation pump or if it is permanently switched on (DHW circulation pump operating mode: [On]), this setting affects the DHW circulation pump operation. [1 x 3 minutes/h] ... [3 x 3 minutes/h] ... [6 x 3 minutes/h]: the DHW circulation pump goes into operation once ... 6 times per hour for 3 minutes. [Permanent]: the DHW circulation pump is permanently in operation.
Autom. therm. disinfect.	[Yes]: the thermal disinfection is started automatically at the set time. If a solar system is installed, the thermal disinfection must also be activated for this (→ Technical documentation [MS 100] or [MS 200]). [No]: the thermal disinfection is not started automatically.
Therm. disinfection day	[Monday] ... [Tuesday] ... [Sunday]: weekday on which thermal disinfection is performed. [Daily heat-up]: thermal disinfection is performed daily.
Therm. disinfection time	[00:00 ... 02:00 ... 23:45]: time of day for the start of thermal disinfection at the set day.
Therm. disinfection temp.	[60 ... 65...80] °C: temperature to which the DHW volume is heated during thermal disinfection.
Maximum duration	[60 min...180...240] min: Maximum duration of the thermal disinfection.
Heat maint. time	[0 h...1...6] h: Time during which the temperature is held at thermal disinfection.
Daily heat-up	[Yes]: The DHW volume is automatically heated up daily at the same time to 60 °C. [No]: No daily heat-up.
Daily heat-up time	[00:00 ... 02:00 ... 23:45]: time for the start of the daily heat-up.
DHW alternating operation	[Yes]: If a simultaneous heat requirement from the heating system and the DHW system are present, the heat source will alternatingly supply the heating system or DHW based on set times. [No]: DHW heating has the higher priority and interrupts heating mode, if necessary.
	[Prioritise DHW for]: [0...30...120] min: Duration of DHW heating.
	[Heating priority for]: [5...20...120] min: Duration of heating mode.
Heat. circ. p. on, DHW op.	[Yes] [No]: Set if all heating circulation pumps should run when DHW heating is active.

Table 17 Settings in the DHW menu

DHW settings menu for fresh water station



If a fresh water station is installed and configured for the system, this menu replaces the standard DHW menu.



Setting the DHW temperature ≥ 52 °C can lead to higher electricity cost as the electric booster heater may be activated.

Menu item	Control range: Function description
Max. DHW temp.	Set the maximum DHW-temperature for the system.
DHW temp. comf.	[15... 65] °C: set the DHW-temperature for the comfort mode (depending on the installed heat source).
DHW temp. Eco	[15... 65] °C: set the DHW-temperature for the Eco mode (depending on the installed heat source).
Circulation time	[Yes] [No]: activate or deactivate the DHW circulation pump.
Circulation oper. mode	[Off]: circulation off. [On]: circulation permanently on (by taking the start frequency into account). [As DHW system]: Activate the same time program for circulation as for DHW heating. Further information and settings of the customised time program (→ user interface operating instructions). [Own time program]: activate customised time program for circulation. Further information and settings of the customised time program (→ user interface operating instructions).
DHW circ. start freq.	If the DHW circulation pump is active via the time program for the DHW circulation pump or if it is permanently switched on (DHW circulation pump operating mode: [On]), this setting affects the DHW circulation pump operation. [1 x 3 minutes/h] ... [3 x 3 minutes/h]... [6 x 3 minutes/h]: the DHW circulation pump goes into operation once ... 6 times per hour for 3 minutes. [Permanent]: the DHW circulation pump is permanently in operation.
Circulation pulse	[Yes] [No]: The circulation pump runs for 3 minutes as soon as there is a short tap (2-10 seconds). The pump is then blocked for 10 minutes.
Automat. therm. disinfect.	[Yes]: the thermal disinfection is started automatically at the set time. [No]: the thermal disinfection is not started automatically.
Therm. disinfection day	[Monday] ... [Tuesday] ... [Sunday]: weekday on which thermal disinfection is performed. [Daily heat-up]: thermal disinfection is performed daily.
Therm. disinfection time	[00:00 ... 02:00 ... 23:45]: time of day for the start of thermal disinfection at the set day.
Therm. disinfection temp.	e.g. [60 ... 65...80] °C: temperature to which the DHW volume is heated during thermal disinfection.
Daily heat-up	[Yes]: The DHW volume is automatically heated up daily at the same time to 60 °C. [No]: No daily heat-up.
Daily heat-up time	[00:00 ... 02:00 ... 23:45]: time for the start of the daily heat-up.

Menu item	Control range: Function description
Fault display	[Yes]: If a fault occurs in the fresh water system, the output for a fault message is switched on.
	[No]: If a fault occurs in the fresh water system, the output for a fault message is not switched on (always without power).
	[Inverted]: The fault message output is energized in normal operation, but if a fault occurs in the fresh water system the output is deenergized.
Keep hot	[Yes] [No]: Activate the warm keeping function. If the fresh water system is far from the buffer tank, it can be kept warm by circulation. The primary circuit pump starts every 15 minutes until the hot water target temperature is reached on the flow sensor.
Ht main. sw.-on temp. diff	Set the temperature difference between set temperature and actual temperature that is required to start the warm keeping function.
Sw.diff. ret. stratification	Set the temperature difference between the buffer tank temperature (at the level of the return valve) and the secondary-side cold water inlet temperature for switching the return valve.

Table 18 Settings in the DHW fresh water station menu

4.5 Menu: Pool settings

Make the pool heating specific settings in this menu. These settings are only available if the system is designed and configured accordingly and the type of appliance used supports this setting.

Menu item	Control range: Function description
Pool module available?	[Yes] [No]: Set if a pool module is installed.
Pool mixing valve	[10...6000] s: Set the runtime for the pool mixing valve.
Control rate pool op.	Set the control value that regulates the compressor control speed. A higher value results in higher speed.
Del. aux. heater pool oper.	[60...1200] K x min: Set the additional heater switch-on delay for pool heating. The delay is depending on time and deviation from desired flow temperature.
Logic external connection	[Open contact]: Open contact is interpreted as "On". [Closed contact]: Closed contact is interpreted as "On".

Table 19 Settings in the pool data menu

4.6 Solar thermal system settings

If a solar thermal system is integrated into the heating system via a module, corresponding menus and menu items are available. Extension of the menus by the solar thermal system is described in the operating instructions of the used module.

In the **Solar settings** menu the sub-menus listed in Tab. 20 are available **with all solar thermal systems**.

NOTICE

Risk of system damage!

- Charge and vent solar system before commissioning.

Menu item	Purpose of the menu
Change solar configuration	Graphic configuration of the solar thermal system.
Current solar configuration	Graphic representation of the configured solar thermal system.

Menu item	Purpose of the menu
Solar parameters	Settings for the installed solar thermal system.
Start solar thermal system	Once all required parameters have been set, the solar thermal system can be started up.

Table 20 General settings for the solar thermal system

4.7 Settings for the hybrid system

Set the energy/price ratio in the **Hybrid system** menu. Further information is available in the instructions supplied with the hybrid system components.

4.8 Save all settings

Select **Commissioning complete** to confirm and save all settings done in the service menu, when the commissioning is complete. After first commissioning, the settings should be saved whenever a change is done.

4.9 Diagnosis menu

The **Diagnosis** service menu contains a number of tools for diagnosis. Note that the menu items shown will vary depending on the heating system.

4.9.1 Function test menu

This menu can be used to test active heating system components individually. If the option **Activating function checks** is set to **Yes** in this menu, the normal heating mode is interrupted in the entire system. All settings are saved. The settings in this menu are only temporary and revert to the respective default settings as soon as **Activating function checks** is set to **No** or the **Function check** menu is closed. The available functions and the possible settings vary depending on the system installed.

A function test is performed by setting the parameters of the listed component accordingly. You can check whether the compressor, mixing valve, circulation pump or 3-way-valve responds appropriately by inspecting the behaviour of the corresponding component.

E.g. can the **Air purge mode** be activated:

- **On:** the air purging mode starts.
- **Off:** The air purging mode is deactivated.

4.9.2 Monitored values menu

Heating system settings and measurements are displayed in this menu. For instance the flow temperature or the current DHW temperature can be displayed here.

You can also call up detailed information on system parts, e.g. the heat source temperature. The information and values that are provided depend on the system that has been installed. Observe the technical documents for the heat source, modules and other system components.

4.9.3 Fault display menu

Current faults and the fault history are displayed in this menu.

Menu item	Description
Current faults	All current faults that are present in the system are displayed here according to their severity.
System fault history	The last 20 faults for the entire system are chronologically displayed here. The fault history can be deleted in the Reset menu (→ Chapter, 4.9.7).
Heat pump fault history	The last 20 faults for the heat pump are chronologically displayed here. For each fault that is stored, a snapshot is available of the data recorded in the system at the time the fault occurred. The fault history can be deleted in the Reset menu (→ Chapter, 4.9.7).

Table 21 Information in the fault display menu

4.9.4 SnapShot menu

Additional information about the system status in the occurrence of a fault can be found with this function.

- ▶ Open the menu: Service menu > Diagnosis > Fault displays > Heat pump fault history
- ▶ Turn the selector until the fault you are searching for appears.
- ▶ Press and hold the info key until a list of data is displayed.
- ▶ Turn the selector to view additional data in the list.

4.9.5 System information menu

The software versions of the BUS nodes installed in the system can be called up in this menu.

4.9.6 Maintenance menu

The contact address for a service company can be set in this menu.

The contact address is automatically displayed to the end user in case of a fault.

Entering company name and telephone number

The current cursor position will flash (marked by |).

- ▶ Turn the selector to move the cursor.
- ▶ Press the selector to activate the input field.
- ▶ Turn and press the selector to enter characters.
- ▶ Press ↵ when you have finished making entries.
- ▶ Press the ↵ key again to switch to the next higher menu. Further information on the text input can be found in the operating instructions of the user interface (→ Renaming heating circuit).

4.9.7 Reset menu

You can delete different settings or lists or reset them to the default setting in this menu.

Menu item	Description
System fault history	The system fault history is deleted. If currently a fault is present, it is immediately entered again.
Heat pump fault history	The heat pump fault history is deleted. If currently a fault is present, it is immediately entered again.
Heating circ. time prog.	The time programs of all heating circuits are reset to the default setting.
Time prog. DHW	All time programs of all DHW systems (including the time programs for the DHW circulation pump) are reset to the default setting.
Time prog. Ventilation	All venting system settings are reset to the default setting. The venting system needs to be re-commissioned following this reset.
Ventil. elapsed times	The operating hours for the venting system are reset to zero.
Solar therm.syst. el. times	The operating hours for the solar system are reset to zero.
Sol. therm. system	All solar system settings are reset to the default setting. The solar system needs to be re-commissioned following this reset.
Hours run	The operating hours are reset to zero.
Restore commissioning sett.	All commissioning settings saved by the installer are restored.
Restore default settings	All default settings are restored. The system needs to be re-commissioned following this reset.

Table 22 Resetting the settings

4.9.8 Calibration menu

Menu item	Description
Time correction	<p>This correction (- 20 ... 0 ... + 20 s) is automatically carried out once a week.</p> <p>Example: deviation of the time by approximately - 6 minutes per year</p> <ul style="list-style-type: none"> - 6 minutes a year is equal to - 360 seconds a year 1 year = 52 weeks - 360 seconds: 52 weeks - 6.92 seconds per week Correction factor = + 7 s/week.

Table 23 Settings in the Calibration menu

5 Technical data

Ball pressure test temperature	75 °C
Degree of pollution	2

Table 24 Technical data

6 Environmental protection and disposal

Old electrical and electronic appliances



This symbol means that the product must not be disposed of with other waste, and instead must be taken to the waste collection points for treatment, collection, recycling and disposal.

The symbol is valid in countries where waste electrical and electronic equipment regulations apply, e.g. "European Directive 2012/19/EC on old electronic and electrical appliances". These regulations define the framework for the return and recycling of old electronic appliances that apply in each country.

As electronic devices may contain hazardous substances, it needs to be recycled responsibly in order to minimize any potential harm to the environment and human health. Furthermore, recycling of electronic scrap helps preserve natural resources.

For additional information on the environmentally compatible disposal of old electrical and electronic appliances, please contact the relevant local authorities, your household waste disposal service or the retailer where you purchased the product.

You can find more information here:
www.weee.bosch-thermotechnology.com/

7 Data Protection Notice



We, **Bosch Thermotechnology Ltd., Cotswold Way, Warndon, Worcester WR4 9SW, United Kingdom** process product and installation information, technical and connection data, communication data, product registration and client history data to provide product functionality (art. 6 (1) sentence 1 (b)

GDPR), to fulfil our duty of product surveillance and for product safety and security reasons (art. 6 (1) sentence 1 (f) GDPR), to safeguard our rights in connection with warranty and product registration questions (art. 6 (1) sentence 1 (f) GDPR) and to analyze the distribution of our products and to provide individualized information and offers related to the product (art. 6 (1) sentence 1 (f) GDPR). To provide services such as sales and marketing services, contract management, payment handling, programming, data hosting and hotline services we can commission and transfer data to external service providers and/or Bosch affiliated enterprises. In some cases, but only if appropriate data protection is ensured, personal data might be transferred to recipients located outside of the European Economic Area. Further information are provided on request. You can contact our Data Protection Officer under: Data Protection Officer, Information Security and Privacy (C/ISP), Robert Bosch GmbH, Postfach 30 02 20, 70442 Stuttgart, GERMANY.

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8 Unit troubleshooting

A fault appears on the display of the user interface. The cause can be a fault on the user interface, in a component, in an assembly or on the heat source. Where the fault code is not shown within this manual please consult the relevant heat source or component manual.



Structure of table headers:
 Fault code - sub-code - [cause or fault description].

A01 - 811 - and A41 - 4051...4052 - [DHW provision: thermal disinfection unsuccessful]	
Test procedure/Cause	Action
Check if water is possibly being drawn from the DHW cylinder constantly due to a leak or taps being open	If water is being drawn constantly, take action to stop this
Check the position of the hot water temperature sensor; it may be attached incorrectly or suspended in the air	Position the hot water temperature sensor correctly
If the DHW priority was deselected and heating and DHW are running in parallel, the boiler output may not be sufficient	Set DHW heating to "priority"
Check whether the heating coil in the cylinder has been vented completely	Vent if necessary
Check the connection pipes between the boiler and cylinder, and with the aid of the installation instructions, ensure that they are connected properly	Rectify any faults in the pipework.

A01 - 811 - and A41 - 4051...4052 - [DHW provision: thermal disinfection unsuccessful]	
Test procedure/Cause	Action
Using the technical documentation, check whether the installed cylinder primary pump can deliver the required output	Replace the pump if there are deviations
Excessive losses in the DHW circulation line	Check DHW circulation line
Check the hot water temperature sensor according to table	Replace the sensor if there are deviations from the table values
Check the system configuration. The output of the electric booster heater is possibly too small in relation to the required water volume	Check/increase the DHW settings in the service menu >>DHW >> Maximum duration (60 min240 min)

Table 25

A11 - 1000 - [System configuration not confirmed]	
Test procedure/Cause	Action
System configuration not completed	Configure system completely and confirm

Table 26

A11 - 1010 - [No communication via BUS interface EMS 2]	
Test procedure/Cause	Action
Check whether BUS cable was connected incorrectly	Rectify wiring faults and switch controller off and on again
Check whether BUS cable is defective. Remove expansion module from BUS and switch controller off and back on. Check whether the cause of the fault is a module or module wiring	<ul style="list-style-type: none"> • Repair or replace the bus cable • Replace faulty BUS node

Table 27

A11 - 1037 - and A61...A64 - 1037 - [outside temperature sensor - heating standby mode active] (A61 = heating circuit 1...A64 = heating circuit 4)	
Test procedure/Cause	Action
Check configuration. The selected setting requires an outside temperature sensor.	If an outside temperature sensor is not required, select the room temperature-dependent configuration in the controller.
Check the connecting lead between the control unit and outside temperature sensor for continuity	If there is no continuity, rectify the fault
Check the electrical connection of the connecting lead in the outside temperature sensor or on the plug in the control unit	Clean corroded terminals in the outside sensor housing.
Check outside temperature sensor according to table	If values do not match, replace the sensor
Check the voltage at the connecting terminals of the outdoor temperature sensor in the controller in accordance with table	If the sensor values matched, but the voltage values do not match, replace the control unit

Table 28

A11 - 1038 - [Invalid time/date]	
Test procedure/Cause	Action
Date/time not yet set	Set date/time
Prolonged loss of power supply	Avoid voltage failures

Table 29

A11 - 3061...3064 - [No communication with mixer module (3061 = heating circuit 1...3064 = heating circuit 4)]	
Test procedure/Cause	Action
Check configuration (set address at the module). The selected setting requires a heating circuit module	Change configuration
Check the BUS connecting lead to the heating circuit module for damage. BUS voltage at the heating circuit module must be between 12-15 V DC	Replace damaged cables
Heating circuit module defective	Replace heating circuit module

Table 30

A11 - 3091...3094 - [Room temperature sensor defective] (3091 = heating circuit 1...3094 = heating circuit 4)	
Test procedure/Cause	Action
<ul style="list-style-type: none"> • Change the control type of the heating circuit from room temperature-dependent to weather-compensated • Change frost protection from room temperature-dependent to outside temperature-dependent, if necessary 	Replace the system controller or the remote control.

Table 31

A11 - 6004 - [No communication with solar module]	
Test procedure/Cause	Action
Check configuration (set address at the module). The selected setting requires a solar module	Change configuration
Check the BUS connecting lead to the solar module for damage. BUS voltage at the solar module must be between 12-15 V DC.	Replace damaged cables
Solar module defective	Replace the module

Table 32

A31...A34 - 3021...3024 - [heating circuit 1... 4 flow temperature sensor faulty - standby mode active] (A31/3021 = heating circuit 1...A34/3024 = heating circuit 4)	
Test procedure/Cause	Action
Check configuration. The selected setting requires a flow temperature sensor	Change configuration
Check the connecting lead between heating circuit module and flow temperature sensor	Establish a connection properly
Check flow temperature sensor according to table	If values do not match, replace the sensor
Check the voltage at the terminals of the flow temperature sensor at the heating circuit module according to table	If the sensor values matched, but the voltage values do not, replace the heating circuit module

Table 33

A51 - 6021 - [Solar collector temperature sensor defective]	
Test procedure/Cause	Action
Check configuration. The selected setting requires a solar collector temperature sensor	Change configuration.
Check connecting lead between solar module and collector temperature sensor	Establish a connection properly
Check collector temperature sensor according to the table	If values do not match, replace the sensor
Check the voltage at the terminals of the collector temperature sensor on the solar module according to the table	If the sensor values matched, but the voltage values do not, replace the solar module

Table 34

A51 - 6022 - [Cylinder 1 Bottom temp. sensor faulty - heating standby mode active]	
Test procedure/Cause	Action
Check configuration. The selected setting requires a bottom cylinder temperature sensor.	Change configuration
Check connecting lead between solar module and bottom cylinder temperature sensor	Establish a connection properly
Check the electrical connection of the connecting lead at the solar module	If a screw or plug is loose, rectify the contact problem
Check the bottom cylinder temperature sensor according to the table	If values do not match, replace the sensor
Check the voltage at the terminals of the bottom cylinder temperature sensor on the solar module according to the table	If the sensor values matched, but the voltage values do not match, replace the module

Table 35

A61...A64 - 1081...1084 - [two master control units in the system] (A61/1081 = heating circuit 1...A64/1084 = heating circuit 4)	
Test procedure/Cause	Action
Check parameter settings at the installation level	Register room temperature-dependent controller for heating circuit 1... 4 as remote control

Table 36

Hxx - ... - [...]	
Test procedure/Cause	Action
For instance, service interval of heat source elapsed.	Service required; see documents for the heat source.

Table 37

A01 - 5378 - [Outdoor unit defrost failure]	
Test procedure/Cause	Action
Too low temperature of heating system.	Open more thermostats on the heating system.
Defective sensor TL2.	Check sensor TL2 against sensor tables. Replace sensor TL2 if there is a deviation.

Table 38

A01 - 5522 - [Wrong combination of indoor and outdoor units]	
Test procedure/Cause	Action
Not matching combination of heat pump and indoor unit.	Check if the combination is allowed against combination tables.
I/O module in the heat pump has been replaced, but the rotary encoder is not correctly set.	Check rotary encoder setting on the old I/O module or in the electrical wiring diagram.
Installer module in the indoor unit has been replaced, but the rotary encoder is not correctly set.	Check rotary encoder setting on the old installer module or in the electrical wiring diagram.

Table 39

H01 - 5594 - [Air in the system]	
Test procedure/Cause	Action
Heat carrier flow blocked by a valve.	Open all valves blocking the flow.
No heat carrier flow due to faulty primary circulation pump.	Check the primary DHW circulation pump and replace it if faulty.
Air in the appliance.	Perform purging procedure according to the installation instructions of the appliance.

Table 40

H01 - 5239 - [DHW temp sensor TW1 fault]	
Test procedure/Cause	Action
Sensor TW1 / signal cable shorted or broken.	With the sensor disconnected from the installer board, measure and compare the resistance to the sensor table. Repair cable or replace sensor if is deviation found.
Defective installer board.	If the sensor is working correctly and the warning still triggered, replace the installer board.

Table 41

9 Overview of the service menu

The menu items are displayed in the sequence below.

Service menu

Commissioning

- Country information
- Buffer cyl.
- Start configuration wizard
- Enter regional minimum outside temperature.
- VCO valve connected
- Select add. heat appliance
- Mixed aux. heat. conn
- Add. el. heater op. mode
- Fan speed
- Supply air heat. by heat p.
- Heating circuit 1 installed
- Config. HC1 at HP
- Priority heating circuit 1
- Mixer heating circuit 1
- Mixer runtime heat circ. 1
- Heating system heat circ. 1
- Ctrl type h. circ. 1
- Rem. ctr. heat. circuit 1
- Heating circuit 2 installed... Heating circuit 4 installed
- DHW install.
- DHW circ.pump installed
- Size of freshwater station
- Freshwater station 2... 4
- Change freshwater configuration
- Ventilation installed
- Sol.therm.sys. instlld
- Solar extension module
- Pool mixing valve
- Electr. anode in cylinder
- Fuse size
- Confirming configuration

Heat pump

- On/off hysteresis
 - Heating
 - Set on/off hysteresis in cooling mode.
 - Pool
- Stand-alone mode
- Pumps
 - Prim. heating pump mode
 - Minimum flow rate
- External connections
 - External connection 1
 - Logic ext. connection 1
 - Block compr. operation
 - Block HW operation
 - Block heating mode
 - Block cooling mode
 - Overheat. protection HC1
 - ESC blocking time1 on
 - ESC blocking time2 on
 - ESC blocking time3 on
 - Block additional heater
 - PV system

- External connection 2
- External connection 3
- External connection 4
- Fuse size
- Manual defrosting
- Smart grid
 - Heating
 - Selectable peak
 - Forced peak
 - DHW
 - Selectable peak
- PV system
 - Heating peak
 - DHW peak
 - Cooling setback mode
 - Only cool with PV
- Fixed temperature
- Central fault
- Low-noise operation
 - Low-noise operation
 - Low-noise operation of
 - Low-noise operation until
 - Min. outside temp.

Set additional heater

- Gen. additional heater settings
 - Select add. heat appliance
 - Additional heater on delay
 - Mode after EVU block
 - Auxiliary heater only
 - Switch off add. heater
 - Max. add. heater temp.
 - Maximum limit
 - Limit start
 - Electric auxiliary heater
 - Add. el. heater op. mode
 - Lim. with compressor
 - Limit add. heater output
 - Limit DHW mode output
 - Outdoor temp. limit
 - Bivalence point
 - Auxiliary heater with mixer
 - Mixed aux. heat. conn
 - Delay time for mixer
 - Mixer run time
 - Alarm input logic
 - Outs. temp par. mode
 - Bival. pt. parallel mode
 - Outdr temp switch mod
 - Bival. pt. switch mode
 - Add. heater DHW cylinder

Set heating/cooling

- System data
 - Buffer cyl.
 - Config. HC1 at HP
 - Internal heating pump
 - Min. outside temp.
 - Damping
 - Building type

- Cooling frost sensor
- Priority heating circuit 1
- Heating circuit 1 ... 4
 - Heating circuit installed
 - Remote ctrl
 - Heating system
 - Heating circuit function
 - Control type
 - Set heating curve
 - Design temperature
 - End point
 - Base line
 - Max. flow temperature (Maximum flow temperature)
 - Solar effect
 - Room influence
 - Room temperature offset
 - Constant heat below
 - Frost prot.
 - Frost prot. limit temp. (Frost protection limit temperature)
 - Sum./winter changeover
 - Summer mode from
 - Cooling mode from
 - Heating direct start limit
 - Cooling switch-off delay
 - Cooling switch-on delay
 - Heating switch-off delay
 - Heating switch-on delay
 - Room temp. switch. diff.
 - Dew point temp. diff.
 - Min. set flow temperature
 - Mixer
 - Mixer run time
 - Shown in standard display (Visibility in the standard display)
- Screed drying
 - Activated
 - Wait time before start
 - Start phase period
 - Start phase temp.
 - Heat-up phase increment
 - Ht-up phase temp. diff. (Heat-up phase temperature differential)
 - Holding phase period
 - Holding phase temp.
 - Cool-down phase incr.
 - Cool-down ph. temp.diff. (Cool-down phase temperature differential)
 - End phase period
 - End phase temp.
 - Max. interruption time (Maximum interruption time)
 - Screed dry. System (Screed drying system)
 - Screed dry. HC 1 ...4 (Screed drying heating circuit 1 ... 4)
 - Start
 - Interrupt
 - Continue

DHW settings

- DHW operation energy manager
 - Switch-on temp. EM
 - Switch-off temperature EM
- DHW comfort
 - Switch-on temperature
 - Switch-off temperature

- Ramp-up delay
- DHW Eco
 - Switch-on temperature
 - Switch-off temperature
 - Ramp-up delay
- DHW Eco+
 - Switch-on temperature
 - Switch-off temperature
 - Ramp-up delay
- DHW circ. pump
- Circulation oper. mode
- DHW circ. start freq.
- Autom. therm. disinfect.
- Therm. disinfection day
- Therm. disinfection time
- Maximum duration
- Therm. disinfection temp.
- Daily heat-up
- Daily heat-up time
- DHW alternating operation
 - DHW alt. operation on
 - Prioritise DHW for
 - Heating priority for
- Heat. circ. p. on, DHW op.

DHW settings (Fresh water station)

- Max. DHW temp.
- DHW comfort
- DHW Eco
- Circulation time
- Circulation oper. mode
- DHW circ. start freq.
- Circulation pulse
- Automat. therm. disinfect.
- Therm. disinfection day
- Therm. disinfection time
- Daily heat-up
- Daily heat-up time
- Fault display
- Keep hot
- Ht main. sw.-on temp. diff
- Sw.diff. ret. stratification

Ventilation settings

- → Installer manual for the ventilation unit.

Pool settings

- Pool module available?
- Pool mixing valve
- Control rate pool op.
- Del. aux. heater pool oper.
- Logic external connection

Solar settings

- Sol.therm.sys. instlId
- Change solar configuration
- Current solar configuration
- Solar parameters
 - → Installer manual for the solar thermal system.

- Start solar thermal system

Hybrid system

- Energy/price ratio

Anti-seizing protection

- Start Time

Save all settings

- Commissioning complete

Diagnosis

- Function check
 - Activating function checks
 - Heat pump
 - ...
 - Heating circuit 1 ... 4
 - ...
 - DHW settings
 - ...
 - Ventilation
 - ...
 - Pool
 - ...
 - Solar
 - ...
 - Monit.values
 - Heat pump
 - ...
 - Heating circuit 1 ... 4
 - ...
 - DHW settings
 - ...
 - Ventilation
 - ...
 - Pool
 - ...
 - Solar
 - ...
 - Output limiter
 - ...
 - Fault displays
 - ...
 - System information
 - ...
 - Maintenance
 - ...
 - Reset
 - ...
 - Calibration
 - ...
 - SnapShot
 - ...
-



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