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Pellet boiler 32-90 kW

Operation

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Contents

1 General information

Copyright

Subject to technical alterations

We reserve the right to make technical modifications without notice. Printing and typesetting errors or changes of any kind made in the interim are not cause for claims. Individual configurations depicted or described here are only optionally available. In the event of contradictions between individual documents regarding delivery scope, the information in our current price list applies.

Explanation of symbols

 Instructions and information

Layout of safety instructions

 **SIGNAL WORD!**

Type and source of danger

Possible effects

- Measures for avoiding the danger

Types of safety instruction

 **CAUTION!**

On non-compliance with this safety instruction, there is a risk of material damage.

 **WARNING!**

On non-compliance with this safety instruction, there is a risk of physical injury.

 **DANGER!**

On non-compliance with this safety instruction, there is a risk of major physical injury.

2 Preface

Dear Customer,

This user manual provides important information and instructions, to ensure safe and satisfactory operation of your product.

Please take the time to look through it.

Warranty and guarantee

You should also read the "Conditions for warranty, guarantee, liability" (see page 8) carefully. As a rule, these conditions will be satisfied by a professional heating technician. Nevertheless, inform the technician of our warranty conditions. All of the requirements we impose are intended to prevent damage that neither you nor we wish to occur.

Read the user manual

Please read the user manual carefully before starting up the system. This is the only way to ensure that you can operate your new boiler efficiently and with minimum environmental impact.

Take advantage of the knowledge and skills of an expert

Only allow an expert to assemble, install and commission the equipment and carry out the basic boiler settings. Insist on receiving an explanation and training on how your new boiler functions and how to operate and maintain it.

Extended warranty

We grant an extended warranty if the product is commissioned by an authorised partner company or by our own customer service.

In this connection, please note the warranty conditions applicable at the time of purchase.

Service agreement

You can ensure the best care for your heating system by taking out a service agreement with one of our certified contractors or our own customer service.

Remote control of the boiler via the internet

The remote control enables you to operate your ETA boiler remotely via your own network (VNC Viewer) or the internet <www.meinETA.at> using a PC, smartphone or tablet, as though you were standing right in front of the ETAtouch control system of your ETA boiler.

For details, see operating manual "meinETA communication platform".

A LAN cable is required for the connection from the ETAtouch control system to the internet modem.

For details see the boiler installation instructions.

3 Warranty, guarantee and liability

Requirements

We can only accept liability for the function of our products if they are correctly installed and operated. This is only possible if the conditions below are complied with.

Maximum of 2,000 hours at full load per year

The boiler described in this user manual may only be used for heating and producing hot water, with no more than 2,000 full-load hours annually.

Installation in a dry room

For set-up, a dry room is required. In particular, only condensation dryers may be used as clothes dryers in the same room.

Observe local building and fire safety regulations

Local building and fire safety regulations must be observed.

Suitable fuel

The boiler is suitable for use with wood pellets according to ISO 17225-2:2014, quality class A1, ENplus-A1. Operation with unsuitable fuels, in particular those containing halogens (chlorine) or high-slag pellets such as from grain waste, is not permitted.

Ensure supply air is free from aggressive substances

The air supplied to the boiler must be free from aggressive substances such as chlorine and fluorine from solvents, cleaning agents, adhesives and propellants, or ammonia from cleaning agents, to prevent corrosion of the boiler and chimney.

Only fill with softened water

Water is the intended heat-transfer medium. For special antifreeze requirements, up to 30% glycol may be added. Softened water is required for the initial fill-up of the heating system and for refilling after repairs. Addition of hard water should be minimised to limit limescale build-up in the boiler.

For the initial fill-up, the lime content of all water in the heating system may not exceed the value of 20,000 lt°dH (system volume in litres multiplied by the hardness in degrees of German hardness).

pH value between 8 and 9

The pH value of water used to fill the heating system must be between 8 and 9.

Use a sufficient number of shut-off valves

Set enough shut-off valves to avoid bleeding large amounts of water during repairs. Any leaks in the system must be repaired at once.

Install safety valve and thermal relief valve

A safety valve (triggered at 3 bar) as protection against excess pressure and a thermal relief valve (triggered at 97 °C) to protect against overheating must be installed by the contractor.

Provide a sufficiently large expansion tank or a pressure maintaining device

To prevent air from being drawn in while the system is cooling, the heating system professional must provide a sufficiently large expansion tank or a pressure maintaining device.

Open expansion tanks must not be used.

Sufficient power

Operation at lower power than the lowest power specified on the type plate is not permitted.

Expanding the control system

Only components provided by us may be used for expanding the control system, unless these are generally available standard devices, such as thermostats.

Regularly perform cleaning and maintenance

Cleaning and maintaining the product is essential. The required steps and intervals are either contained in this documentation or included as a separate document.

Repairs

Repairs are only permitted using spare parts provided by us. The only exceptions are commonly available standard parts such as electrical fuses or fastening materials, provided such parts have the necessary features and do not compromise the safety of the system.

Proper installation

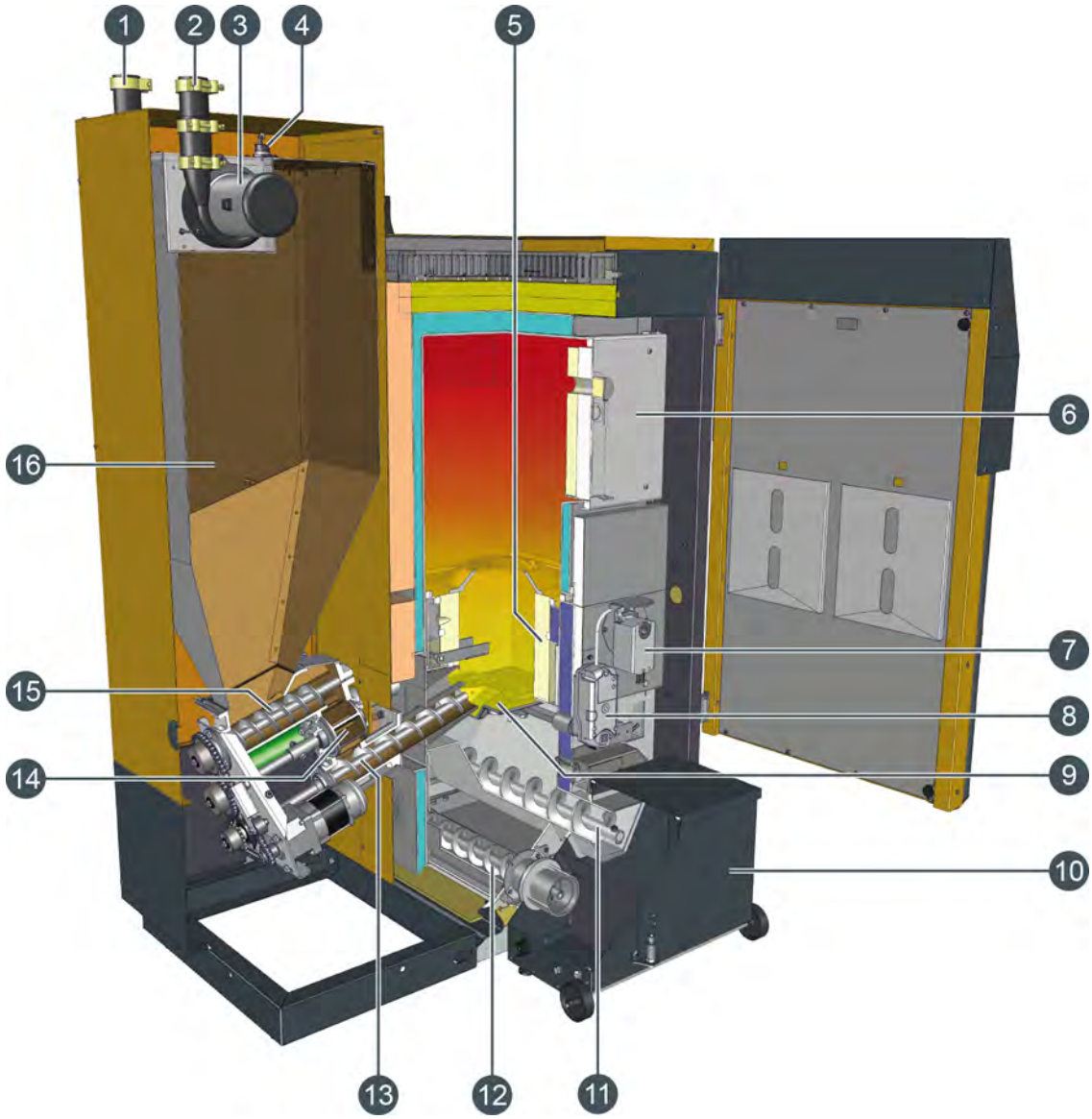
The installing contractor is liable for proper installation according to the corresponding installation instructions and the relevant rules and safety regulations. If you as customer have installed the heating system partly or entirely without relevant training and in particular without up-to-date practical experience, without having the installation checked by a trained and responsible

expert, we exclude defects in our delivery and consequential damages resulting from this cause from our warranty, guarantee and liability.

Repair of defects

For repairs of defects carried out by the customer or by a third party, ETA shall only bear the costs or remain obligated by warranty if this work was approved in writing in advance by the customer service of ETA Heiztechnik GmbH.

4 Boiler functionality



1 Pellet suction hose DN 50
2 Pellet back air DN 50
3 Vacuum motor for pellets
4 Fill level sensor
5 Refractory-lined combustion chamber
6 Combustion chamber door
7 Actuator for secondary air
8 Actuator for tilting grate
9 Tilting grate
10 Ash box
11 Ash screw under tilting grate
12 Ash screw under the turbulators
13 Stoker screw
14 Rotary valve
15 Metering screw
16 Pellet bin

How the boiler works

Optimum fuel efficiency with lambda control

Gasification of the wood (output) can be controlled via the flow of primary air. Through use of the lambda-controlled secondary air, combustion is kept clean and highly efficient. A lack of air means there is not enough oxygen for complete combustion. On the other hand, too much air also results in incomplete combustion as it cools the fire. Below 700 °C, not all of the wood gas is burned. Too much air also pulls unused heat out of the boiler. The lambda probe ensures optimum combustion and maximum fuel utilisation in everyday operation.

Turbulent heat exchanger with cleaning

After complete combustion, the hot gas flows into the cold section of the boiler, where it transfers its heat to the boiler water. First it flows smoothly through a downdraught channel for ash sedimentation and then turbulently through the heat exchanger tubes, which are equipped with turbulators. The more turbulent the flow, the more the gas comes into contact with the tube walls, thus ensuring maximum transfer of heat to the boiler water. This ensures low exhaust temperatures and high efficiency.

During cleaning (grate tipping) the turbulators are also moved to scrape the flue ash from the heat exchanger tubes. The ash is transported to the ash box by an ash screw.

Underpressure for maximum safety

A draught fan at the boiler outlet causes underpressure throughout the boiler, thus ensuring high operational safety without risk of deflagration and burn-back. The airtight rotary valve makes the usual combustion air fan unnecessary. The required air is drawn into the combustion chamber through the regulated primary and secondary air flaps as a result of the underpressure within the boiler.

From pellet store to pellet bin on boiler

The pellets are transported from the pellet store to a bin in the boiler by a vacuum motor. The bin holds 90 kg of pellets, from which 441 kWh of heat can be produced. This scheme reduces the fill-up times. For low heating loads in autumn and spring, once or twice per day for 5 to 10 minutes. On extremely cold days at full load, the bin on the 90 kW boiler needs to be refilled as many as seven times per day.

Maximum protection against burn-back

When the truck fills your pellet store, air is sucked out of the storeroom. This cannot be controlled exactly. Slight overpressure can force hot combustion gases out of the boiler into the boiler room. Worse is underpressure, which draws the fire out of the boiler into the pellet store. So the fire should be out when pellets are delivered. What if you are not at home and forgot to switch off the boiler?
The airtight rotary valve keeps the combustion chamber safely separated from the fuel deposit in all operating states. No hot gas can enter the fuel conveying system and ignition of the pellets is impossible. This is the most reliable burn-back protection possible.

The rotary valve is positioned between the pellet bin and the combustion chamber, separating them during operation. A metering screw is positioned upstream from the rotary valve; it prevents overfilling and the resulting wear on seal edges to ensure protection against burn-back throughout the service life of the boiler.

Hot combustion chamber with tilting grate

A refractory-lined combustion chamber with secondary air turbulence guarantees a clean fire with a high burnout temperature, while flue gas recirculation minimises the grate temperatures to prevent slag formation. The pellets are pushed onto the side of the grate without diversions or bottlenecks. At intervals that depend on the output level, the grate is tilted by 90° after a controlled ember burnout in order to automatically remove ash from the combustion chamber. Until the next time the grate is tipped, the ash remains under the grate and can burn out before it is transported by the ash screw to the detachable ash box.

No ash sintering with flue gas recirculation

Recirculated flue gas from the boiler outlet is added to the primary air, increasing the gas flow though the grate as well as through the fire and cooling the grate better. The distribution of the fire's heat over a larger gas volume helps to achieve a narrower and more stable temperature range. Temperatures are held safely above 800 °C for complete, clean combustion and safely below 1,000 ?, far below the sintering point of wood ash. This prevents the formation of slag, a common concern with pellets.

Optimised ignition

After short breaks in combustion, the refractory-lined combustion chamber remains hot enough that any new fuel which is fed in can be ignited by the remaining embers. The ignition fan only needs to be activated after long periods without combustion. To save electricity, the ignition fan is deactivated immediately after successful ignition, which is recognised by the lambda probe and exhaust temperature.

Combustion breaks with minimal heat loss

The fire can be regulated between minimum and maximum output. In autumn and spring, when heating loads are smaller, the output is regulated by pauses in

combustion. To avoid a build-up of smouldering tar in the boiler and chimney during these pauses, the fire undergoes a controlled burnout. Closing the primary and secondary air flaps ensures that no air can flow through the boiler in standby, thus preventing unused heat from being drawn into the flue.

5 Emission measurement

Why measure emissions?

It is a requirement for the carbon monoxide (CO) emissions of every boiler to be measured periodically. In Germany, this periodic measurement must also include a dust measurement.

There are several aspects of this that could go wrong, resulting in incorrect measurements even though the boiler fully and consistently complies with these limits when operating in accordance with the relevant standards.

Notes on emission measurement in Germany

In accordance with the provisions of "BImSchV," lower limit values for the emission measurement in Germany apply to all new heating system installations starting 1 January 2015. Notes on compliance are found under 10 "Low-emission operation".

Clean the boiler 3 - 5 days before the emission measurement

Thoroughly clean the boiler and flue pipe 3 - 5 days before the emission measurement. Once this is complete, heating can resume as usual.

This delay between cleaning and measurement is necessary in order to allow dust disturbed during cleaning to settle again. If the chimney sweep measures unsettled dust, the dust reading will be higher than normal and thus inaccurate.

CAUTION!

▶ Under no circumstances clean the boiler and flue pipe on the day of the measurement!

Ensure sufficient heat consumption

Open all radiator valves and turn radiator thermostats to maximum.

Allowing the boiler to cool

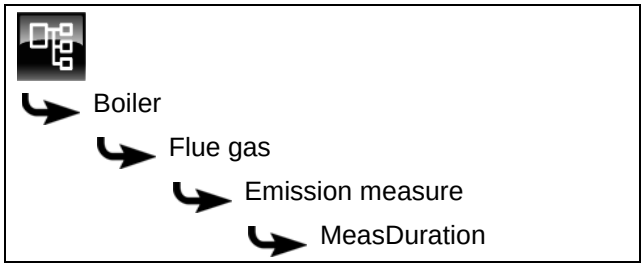
Switch off the boiler 3 to 5 hours before the emission measurement by pressing the [On/Off] button.

This allows the boiler to cool, and the additional water in the boiler is used to discharge heat during the emission measurement.

Setting the duration of the emission measurement

The duration of the emission measurement is factory-set to 30 minutes. If necessary, this can be increased with the [Service] access level.

With the [Service] access level, change to the text menu of the [Boiler] function block. You can adjust the duration as follows:



Select the parameter and press [Change].

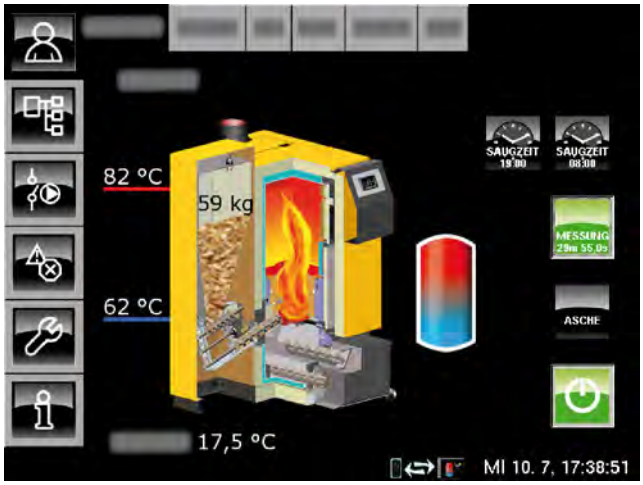
A settings screen opens.

Select the desired duration and press [Accept] to save.

Emission measurement at full load

Before measurement at full load, the boiler must be operating in heating mode for at least 30 minutes, and the flow temperature must be over 65 °C.

To start the emission measurement, press the [MEAS.] button in the boiler overview window. As confirmation, the button lights up green and the countdown in the button begins.



The boiler will now run at full load for the set time. The control system ensures that sufficient heat is channelled to the heating circuits and the hot water tank.

The emission measurement can only take place once the boiler has been operating in this way for at least 10 minutes (i.e. more than 10 minutes of the countdown have elapsed).

After the measurement

Switch the boiler back to normal mode by pressing [MEAS.]. As confirmation, the light in the button goes off.

If you do not press this button, the boiler will automatically switch back to normal mode after the set time (factory setting 30 minutes).

6 Safety

6.1 General information

Operation only by trained personnel

The product may be operated by trained adults only. Training may be provided by the heating technician or our customer service. Please read the associated documentation carefully in order to avoid errors during operation and maintenance.

The product may not be operated by persons with impaired physical, sensory, or mental capabilities. Persons who lack experience and knowledge as well as children may not operate, clean, or maintain the product.

Keep children away from the pellet store

Children must be kept away from the pellet store. It is a good idea to lock the door to the pellet store. The door handle on the inside of the pellet store must not be removed. It must be possible to open the door from the inside in an emergency.

Keep fire extinguishers in a clearly visible location

In Austria, the minimum requirement is an ABC powder extinguisher with 6 kg. An AB foam extinguisher with 9 litres, which produces less damage when used, is preferable. The fire extinguisher should be kept outside the boiler room, visible and easily accessible.

In Germany and Switzerland, fire extinguishers are not required for heating systems in private residences. In spite of this, we recommend having one in the house.

Storage of ash

The ash must be kept in non-flammable containers with covers. Do not put hot ash in the waste bin due to risk of fire.

Emergency stop switch for the boiler

In Austria, heating systems installed in boiler rooms must be equipped with an emergency stop switch. The switch must be situated immediately outside the access door and clearly marked. For boiler rooms that are only accessible from outdoors, these switches may also be within the boiler rooms, immediately next to the access doors.

A single-pole emergency stop switch is integrated into the boiler's safety chain. When actuated, it interrupts the supply of combustion air and fuel. The pumps continue running to cool the boiler.

6.2 Safety devices

Pump safety run, automatic heat dissipation at overtemperature

If the boiler temperature exceeds 90°C (factory setting) for any reason, the pump safety run will start. All heating pumps and boiler pumps that are connected to the boiler control are switched on to dissipate heat from the boiler.

This action prevents the boiler temperature from rising any more and activating further safety devices such as the safety temperature limiter and thermal discharge valve. The pump safety run is displayed on the screen as operating mode [Heat dissipation].

The heat dissipation is limited by the maximum flow temperature set in the heating circuits and the target hot water temperature.

Install thermal emergency cooling valve against overheating

The safety heat exchanger built into the boiler must be connected by the heating technician to the house's cold water supply via a thermal relief valve (opening temperature 97 °C) to protect the boiler against overheating if the pump fails. The minimum pressure in the cold water pipe must be 2 bar.

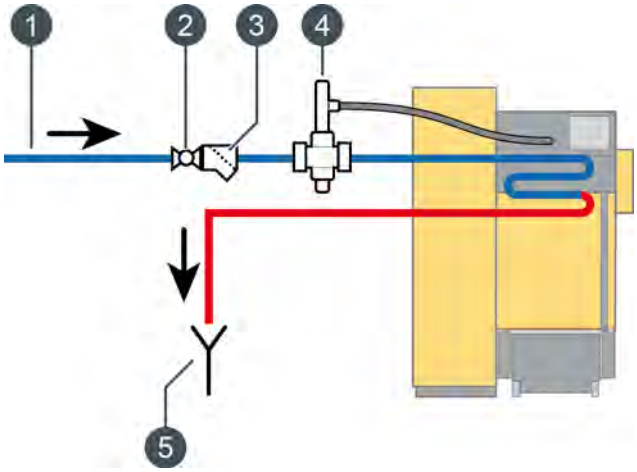


Fig. 6-1: Thermal emergency cooling valve

1 Cold water connection
2 Isolating valve; remove hand wheel
3 Strainer
4 Thermal emergency cooling valve
5 Visible outlet to sewer

The cold water supply must be connected to the upper connector of the safety heat exchanger; the lower connector serves as an outlet to the sewer. To prevent

the supply line from being shut off accidentally, remove the levers from shut-off valves or the hand wheels from valves and hang them there with a piece of wire.

The discharge must have an easily visible flow path so malfunctions can be recognised. Direct the discharged water to the sewer via a siphon funnel or at least with a pipe into the ground so that nobody can be scalded if the valve is activated.

Even for cold water coming from a domestic well with its own pump, a thermal emergency cooling valve must be installed on the boiler. With a generously dimensioned air vessel, enough water for cooling will come even if there is a power failure. If the electricity supply is very uncertain, a dedicated air vessel for the thermal emergency cooling valve is required.

Safety shutdown by safety temperature limiter

For additional safety against boiler overheating, a safety temperature limiter is built into the boiler. When a boiler temperature of 105°C (tolerance 100 to 106°C) is reached, the power supply to the draught fan and the fuel intake is interrupted. If the boiler temperature decreases below 70°C again, the safety temperature limiter can be manually released for a restart of the boiler.

Install safety valve against overpressure

A safety valve with 3 bar opening pressure must be installed on the boiler. No shut-off valve may be installed between the boiler and the safety valve. If solar or other heat sources provide energy to the buffer storage tank via a heat exchanger, a safety valve (3 bar maximum) is also required on the buffer storage tank.

Normally an expansion tank that is too small or defective, or blocked heating lines, are the cause for activation of the safety valve. The safety valve must be on the boiler at the top of the flow in order to discharge heat in an emergency. Only this way can it reduce pressure by blowing out hot water and steam.

⚠ DANGER!

Safety valve outlet

The safety valve outlet must be directed to the ground in a pipe so nobody is endangered by hot water or steam.

- ▶ The safety valve outlet must be directed to the sewer via a clearly visible, open route (siphon funnel) so that malfunctions, especially a failure of the safety valve to close, can be recognised. If no sewer connection is available, the outlet must be directed to the ground in a pipe.

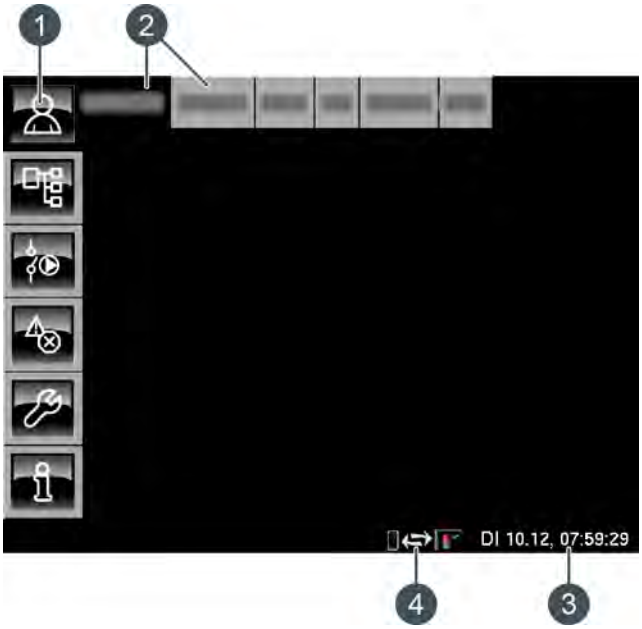
7 Operation

7.1 User interface

7.1.1 Overview

Touchscreen user interface

The touchscreen only displays function blocks that are required and configured to work with your heating system.



1 Menu buttons
2 Heating system function blocks
3 Date and time
4 Remote control (meinETA)

Overview

Displays an overview screen of the selected function block.

Text menu

Allows you to change parameters of the selected function block.

I/O menu

Enables a specialist to assign inputs and outputs and manually operate the outputs of the selected function block.

Messages

Messages of the selected function block (notifications, warnings or errors)

Toolbox

Toolbox for the specialist.

Help

Displays additional information for a parameter selected in the text menu. If additional information is available, the symbol in the button changes to .

7.1.2 Setting the date and time

Explanation

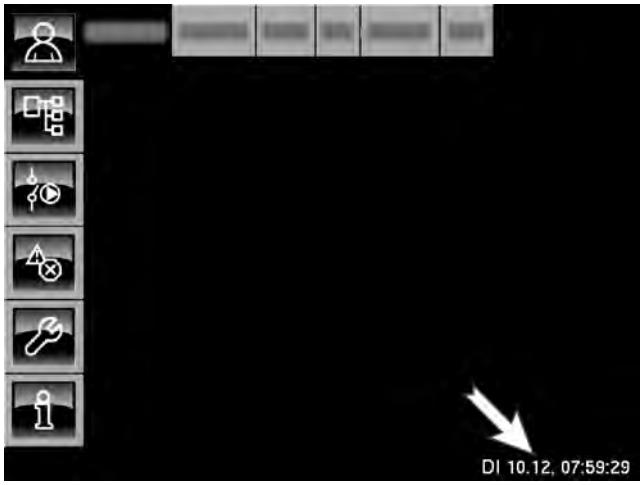
The ETAtouch control system allows you to adjust the date and time to suit your respective time zone.

The date and time are factory-set to Central European Time (UTC+01:00).

Changing the date and time

Press the button to open the function block overview screen.

Tap on the date or time at the bottom right-hand corner of the touchscreen.



A settings screen opens:

By tapping on [Day:], [Month:], [Year:] or [Time:], you can select the parameter that you wish to change.

Enter the new value and press [Accept] to save.

7.1.3 Changing the names of function blocks

Renaming function blocks

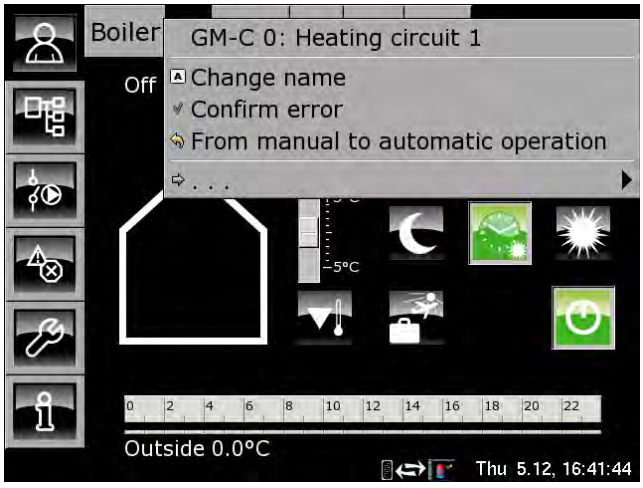
You can individually adapt the names of function blocks to make them easier for you to recognise.

If you are changing the names of function blocks, bear in mind that they should be kept short. This will make the touchscreen clearer.

Changing a name

Tap [HC] twice to rename this function block.

A small menu window opens:



Tap [Change name].

A keypad is displayed:

Enter the new name and press [Accept] to save.

To cancel the process and keep the original name, press [Cancel].

7.1.4 Text menu navigation

Using the text menu

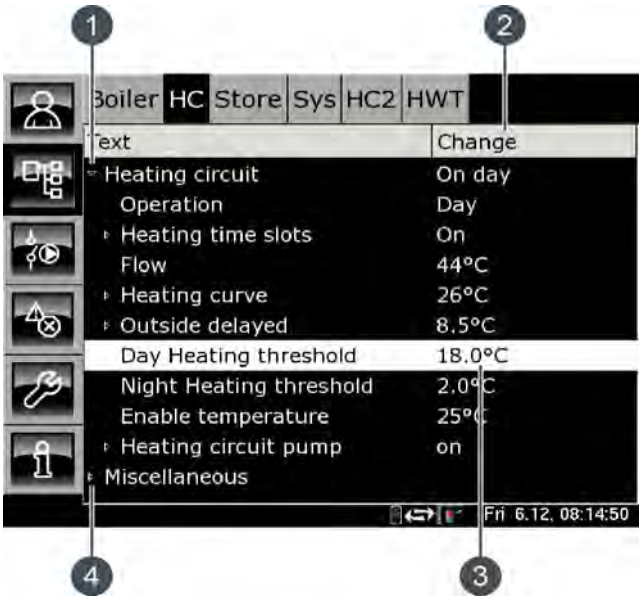
For each function block, there is a text menu. In this window, the available parameters are displayed and can be changed if necessary.

If additional information is available for a selected parameter, the symbol in the button changes to . This additional information is displayed when you press the button.

Only modify parameters if you know what their function is. Before any changes, read the relevant section of the user manual or configuration manual, or the additional information displayed when you press . If you cannot find sufficient information about a parameter, please consult a specialist.

Text menu overview screen

Press the button and [HC], for example, to open the text menu of this function block.



1 Submenu opens
2 [Value] or [Change]
3 Selected parameter
4 Submenu is available

Modifying parameters

Example: Change the [Day heat. lim.] parameter in the [HC] function block.

First, press [HC] to select the function block.

Press to switch to the function block's text menu. The parameter can be found under:

Heating circuit
Day heat. lim.

It is possible to modify certain parameters in order to adapt the heating system to your needs. When you select a parameter that can be changed, the [Value] field changes to the [Change] button.

Press the [Change] button or tap the parameter twice to open a settings window:

1 Name of the parameter
2 Factory settings
3 Adjustment range (minimum and maximum value)

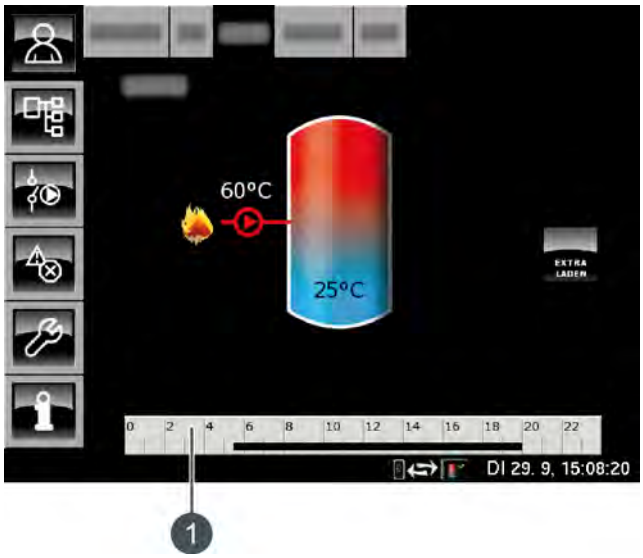
Enter the new value and press the [Accept] button to save.

Press the button to return to the overview window of the function block.

7.1.5 Setting a time window

Setting time window and temperatures

The time window is set with the timer for charging the tank (for example for accumulator tank and hot water tank), or the operating times (for example for the heating circuit).



1 Timer to set a time window

Setting a time window and the hot water temperature for the hot water tank will be described in the following. This example applies accordingly for all other function blocks with timers.

To set the charging times, tap the timer in the overview. An overview opens.

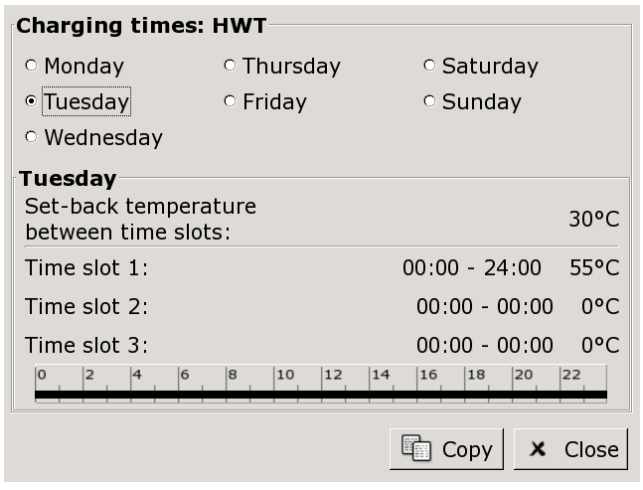


Fig. 7-1: Overview

Set the individual time windows and temperatures by tapping the lines [Time slot 1:], [Time slot 2:], [Time slot 3:] and [Set-back temperature between time slots:]. A settings window appears after tapping.

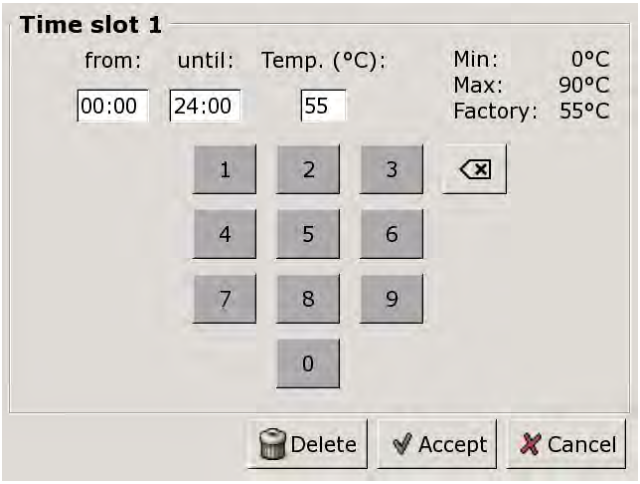


Fig. 7-2: Settings window

Enter the time window and desired temperature and press [Accept] to save. Set the further time windows the same way.

Press the [Delete] button to delete a set time window and restore the factory settings.

Copying time windows

After you have set the time windows, you can copy them for other days of the week. To do this, tap the [Copy] button in the overview screen.

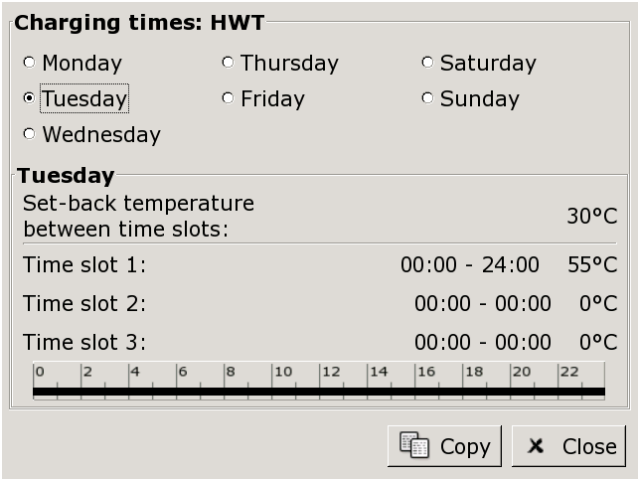


Fig. 7-3: Overview

A screen opens showing the individual days of the week.

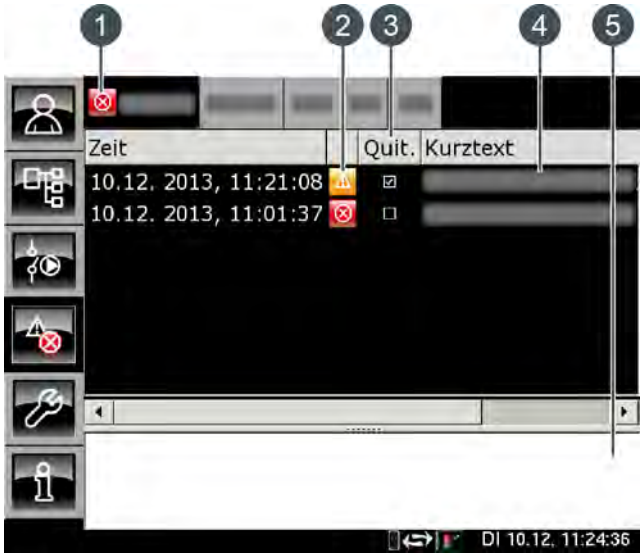
Fig. 7-4: Copying time windows

Make your selection and press the [Accept] button to save.

7.1.6 Messages

Overview of messages

Press the button to go to the messages overview of the selected function block.



1 Symbol for the highest priority type of all occurred messages

2 Symbol for the type of individual message

3 Button for acknowledging a message

4 Brief description of the message

5 Detailed description of the message

In the event of an error, alarm or warning in a function block, the symbol of the button changes.

The possible states are:

- No messages present
- There is a warning
- There is an error or alarm

Types of message

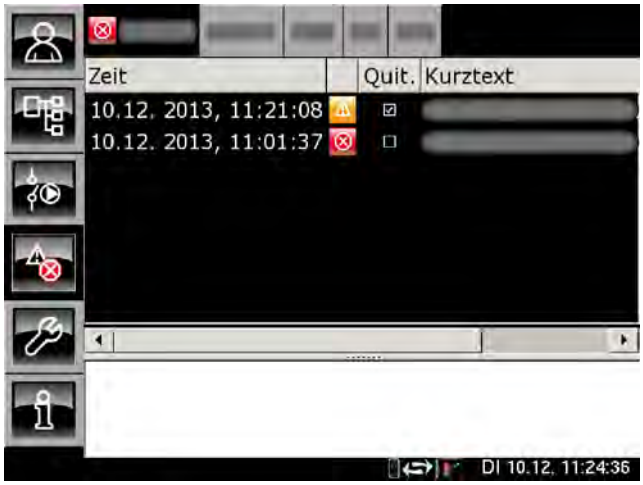
- Notification
  A notification does not interrupt operation, and therefore no acknowledgement is required. Notifications inform the user, for example, that pump anti-blocking protection has been activated.
- Warning
  A warning is displayed on failure of a function that is not absolutely essential for continued operation. It can be acknowledged before the cause of failure is remedied. However, it will continue to be displayed until the cause has actually been dealt with.
- Error, alarm
  An error or alarm stops operation. Some of these can be acknowledged before the cause of the problem is remedied. However, they will continue to be displayed until the cause has actually been dealt with.

Other errors and alarms can only be acknowledged after the cause has successfully been remedied. You can then delete these messages with the [Confirm later] button.

Once an error or alarm has been resolved and acknowledged, you must restart the boiler or the affected heating circuit by pressing the [On/Off] button.

Acknowledging an error

Press the button to open the message window of the selected function block.



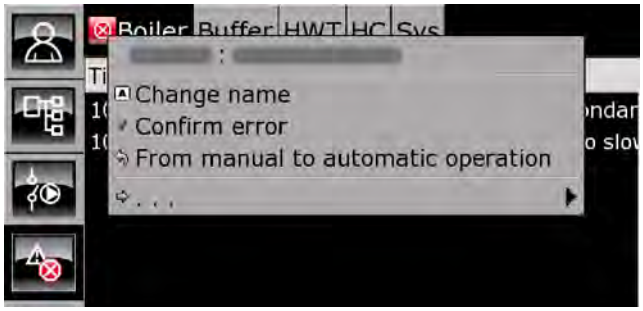
Select the message that you wish to acknowledge.

When you press [Conf.] or tap the row twice, a notice appears.

Press [OK] to acknowledge the message and delete it from the list.

Acknowledging all errors

Tap [Boiler] twice to acknowledge all errors for this function block. A small menu window opens. Tap on the [Confirm error] field in this window.



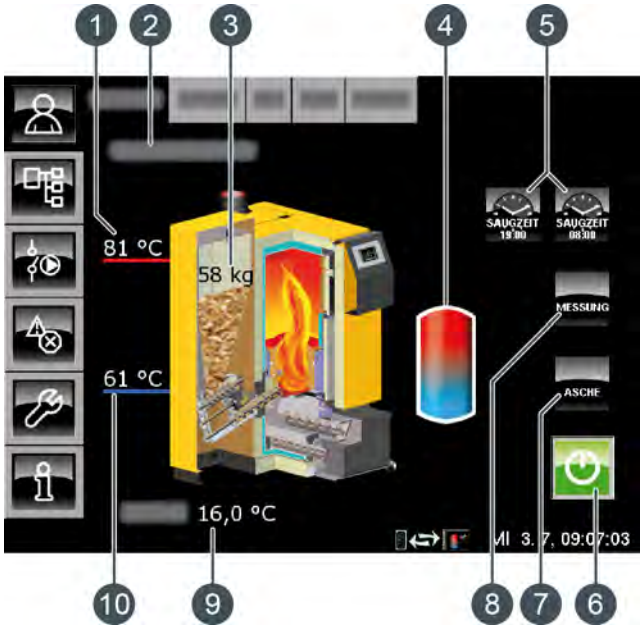
7.2 Function block [Boiler]

7.2.1 Overview

Boiler overview

Press the button and [Boiler] to open the boiler overview window.

Switching the boiler on and off, additional de-ashing, setting the fill-up times and emission measurement all take place in this overview screen.



1 Boiler flow temperature
2 Operating condition
3 Pellet stock in boiler
4 Buffer
5 [FILLTIME] button
6 [On/Off] button
7 [ASH] button
8 [MEAS.] key
9 Outside temperature
10 Return temperature

[On/Off] button

This button switches the boiler on and off. If the boiler is on, this button appears green .

[ASH] button

This button starts boiler de-ashing. If the boiler is in operation, burnout first takes place when this button is pressed, and de-ashing only after this. If the boiler is switched off or on standby, de-ashing can be started straight away.

[MEAS.] button

This button switches the boiler to full load for a period of 30 minutes for the emission measurement. The heat is discharged into the heating circuits and the hot water tank. When the 30 minutes are over, the boiler automatically switches back to normal mode.

[FILLTIME] button

These two buttons are used to set 2 times for completely filling the pellet bin. These times apply for every day of the week.

Boiler pellet stock

58 kg The current stock of pellets in the boiler is displayed. If this stock drops below the minimum level of 10 kg, the suction motor starts and refills the pellet bin. This can also take place at times other than the 2 set fill-up times.

Buffer storage tank charging

This symbol is displayed next to the boiler as soon as it supplies heat to the buffer.

Boiler functionality

Press the [On/Off] button to switch the boiler on and off. When the boiler is switched on, heating starts as soon as there is demand from the connected consumers (either the buffer, the heating circuits or the hot water tank).

The control system calculates the required boiler temperature based on the flow temperatures demanded by the consumers.
If the boiler is supplying heat to the buffer, the symbol appears in the overview window.

The minimum running time for a boiler heating phase is 10 minutes. If there is no more demand from the consumers after that time, the boiler stops heating with a burnout. The operating mode changes to [Ember burnout] and then to [Ready].

The pellet bin on the boiler is automatically topped up as soon as the stock of pellets falls below a minimum limit. The [FILLTIME] buttons are used to set 2 times for completely filling the pellet bin; see page 26.

Boiler de-ashing takes place within a configurable interval; see page 27.
De-ashing can also be disabled for a time, e.g. to prevent the boiler from de-ashing at night; see page 26.

After a certain, configurable quantity of pellets has been consumed, the control system issues a reminder to empty the ash box. If the ash box is only partially full, this quantity can be increased; see page 27.

7.2.2 Operating modes

Switched off

The boiler is off. The [On/Off]  button in the overview screen lights up red.

Fill up pellet bin

The suction process for refilling the boiler pellet bin has been started.

Filling stopped for ignition

The suction process for refilling the boiler pellet bin has been stopped, in order to ignite pellets for a boiler heating phase. After ignition, the fill-up process is restarted.

Warm Start

An attempt is made to ignite the fuel without the electrical ignition using only the heat stored in the combustion chamber.

Igniting

The fuel is ignited using the electrical ignition.

Heating

The boiler is in heating mode and is channelling heat to the consumers.

Ember burnout

At the end of the heating phase, the fuel that is still on the grate is burnt off. No more fuel is fed into the boiler.

Ashbox missing

The ash box is not connected to the boiler.

Filling stopped for de-ashing

The suction process for filling the boiler pellet bin has been stopped for boiler de-ashing. After de-ashing, the fill-up process is restarted.

Ready

When ember burnout is complete, the still switched-on boiler is in standby waiting for a heating demand.

De-ash

The boiler is de-ashing.

Malfunction during ash removal

The ash screw has been switched off due to excessive current consumption. This may be due to a full ash box or blockage of the ash screw by foreign objects.

Malfunction

A malfunction has occurred, preventing the boiler from heating. The cause can be found in the list of error messages.

Ember burnout due to a malfunction

The current heating phase has ended with ember burnout due to a malfunction.

Ember burnout due to external locking

Due to an external lockout (Stop command), the current heating phase has ended with ember burnout.

Locked

Heating not possible, as the boiler has been locked externally (Stop command).

Calibrating lambda probe

The lambda probe is undergoing automatic calibration. It is not possible for the unit to heat whilst in this mode.

7.2.3 Operation

Defining the fill-up times

The [FILLTIME] buttons are used to set 2 times for completely filling the pellet bin. This prevents refilling during the night. These times apply for every day of the week.

To set a fill-up time, press [FILLTIME] in the overview.

A window opens:

Fig. 7-5: Setting the fill-up time

Enter the desired time and press [Accept] to save.

Setting the second fill-up time is done the same way.

By setting a very late time, you can reduce possible pellet bin fill-ups during the night.

You can completely refill the pellet bin immediately by pressing the [Startfilling] button.

7.2.4 Text menu

Adjustable parameters

In function block [Boiler], switch to the text menu with the button.

- Boiler
  - Ash removal
    - Begin idle time WT cleaning
    - Idle time during WT cleaning
    - De-ash after min.
    - De-ash after max.
    - Empty ash box after

Detailed descriptions of the parameters are provided below.

7.2.4.1 Setting the idle time for heat exchanger de-ashing

Explanation of [Begin idle time WT cleaning] and [Idle time during WT cleaning]

The [Idle time during WT cleaning] parameter is used to select the duration of the idle time for heat exchanger de-ashing.

The start time for the idle time is set with the [Begin idle time WT cleaning] parameter.

The factory settings are 10 hours for the duration and 9:00 PM for the start time.

Setting the heat exchanger idle time

The parameters can be found under:

- Boiler
  - Ash removal
    - Begin idle time WT cleaning
    - Idle time during WT cleaning

Select the parameter and press the [Change] button. A settings window will open.

Enter the duration or start time and press [Accept] to save.

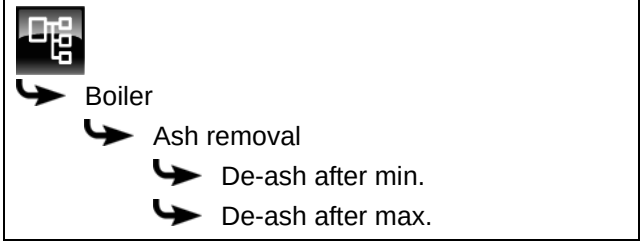
7.2.4.2 Boiler de-ashing interval

Explanation of [De-ash after min.] and [De-ash after max.]

The boiler's de-ashing interval is set with the [De-ash after min.] and [De-ash after max.] parameters. The boiler de-ashes within the range specified by these two parameters.

Changing the de-ashing interval

The parameters can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

The de-ashing interval may only be modified after consultation with a specialist or ETA customer service.

7.2.4.3 Empty ash box after

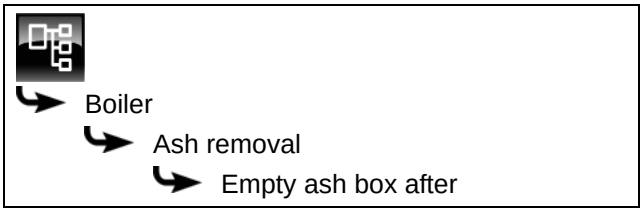
Explanation of [Empty ash box after]

This parameter adjusts the quantity of pellets used, after which a reminder to empty the ash box is displayed on the screen.

If the ash box is then only partially full, this quantity can be increased. If you set the value to zero, the reminder will no longer appear.

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

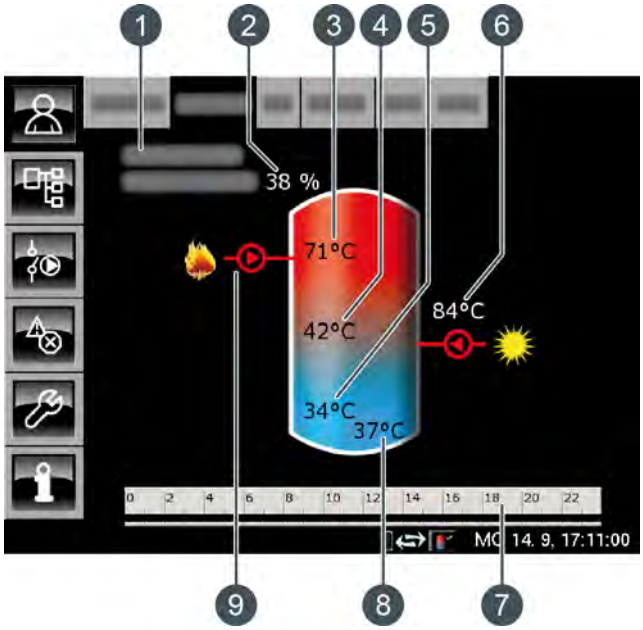
Enter the value and press the [Accept] button to save.

7.3 [Buffer] function block

7.3.1 Overview

Buffer storage tank overview screen

Press the button and [Buffer] to open the overview screen of the buffer storage tank. Here the current temperatures, operating mode and charging status are displayed.



1 Operating condition
2 Buffer charging status
3 Temperature: [Buffer top]
4 Temperature: [Buffer middle]
5 Temperature: [Buffer bottom]
6 Charging by solar heating system, temperature [Collector]
7 Timer: [BufferChrgTimes]
8 Temperature: [Buffer bottom Solar]
9 Charging by boiler

Buffer charging status

By means of the 3 temperature sensors on the buffer, the current charging status is determined and displayed in the overview screen.

A charging status of 0% means that the buffer has only been charged to the configured [Return from consumers] temperature, or lower.
100% means that the buffer has been charged up to the currently required [Buffer target] temperature.

Charging by boiler

This symbol is displayed when the buffer is being charged by the boiler.

If a combination tank is installed, the symbol is shown at the top of the buffer when the hot water rapid charge function is active. If the buffer is charged below the hot water section, the symbol appears in the centre of the buffer.

Charging by the solar heating system

Optional: for solar heating system

This symbol indicates that the tank is being charged by the connected solar heating system. The displayed temperature corresponds to the temperature of the collector.

Timer [BufferChrgTimes]

This timer displays the configured charging times for the current day for charging the buffer. These time windows are displayed as a black bar in the timer.

This timer only applies to the charging of the buffer storage tank, not for a solar heating system, if one is connected.

Timer [HW charging times]

Optional: for [Combin. tank]

With a combination tank, this timer displays the configured charging times for charging the hot water on the current day. These time windows are displayed as a black bar in the timer.

[Extra charge] button

Optional: for [Combin. tank]

With a combination tank, this button enables the hot water section to be charged to the configured hot water temperature outside the set time slot if the temperature has dropped below [Switch-on diff.].

How the buffer storage tank works

You can set different time slots inside which the boiler can charge the buffer (see page 32). Inside a time slot, the control system establishes the required buffer temperature [Buffer target] based on the current demand from the consumers (heating circuit, hot water tank...).

By means of the 3 temperature sensors on the buffer, the current charging status is determined and displayed in the overview screen.

The buffer is charged by the boiler until the current [Buffer top] temperature has exceeded the required [Buffer target] temperature, and the configurable [Buff. bottom off] temperature (see page 34) has also been exceeded. The operating state of the buffer then changes to [Charged].

If there is no demand from consumers, inside the set time slot the buffer is charged to the configurable minimum temperature [Buffer top min.] (see page 33).

Buffer with solar heating system

Optional: only for [Solar charging]

The additional temperature [Buffer bottom Solar] is displayed at the bottom of the overview screen, in the buffer storage tank.

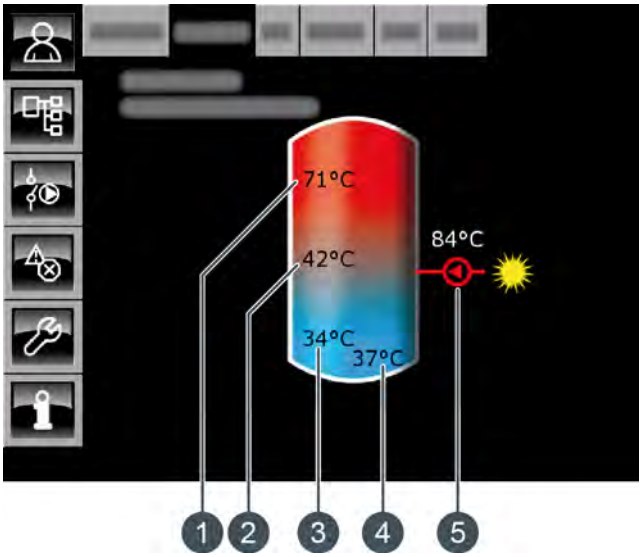


Fig. 7-6: Buffer with solar heating system

1 Temperature [Buffer top]
2 Temperature [Buffer middle]
3 Temperature [Buffer bottom]
4 Temperature [Buffer bottom Solar]
5 Charging by solar heating system, temperature [Collector]

Solar charging of the buffer is controlled by switching the solar panel pump on and off. Solar charging begins as soon as the [Collector] temperature is 5°C higher than the [Buffer bottom Solar] temperature. The solar charging symbol  appears in the overview screen.

If the [Collector] temperature falls below the [Buffer bottom Solar], solar charging ends with the solar panel pump switching off.

The configurable [Buffer bottom max] temperature sets the limit for buffer charging by the solar heating system to prevent the buffer from overheating (see page 36).

The [Solar prio.] function enables the solar heating system to charge the buffer without the boiler being started, inside 2 configurable time slots (see page 36).

Buffer with solar heating system and stratified charging valve

Optional: only with [Solar charging] and [... additional solar charging in buffer middle]

The two temperatures [Buffer top Solar] and [Buffer bottom Solar] are displayed in the overview screen.

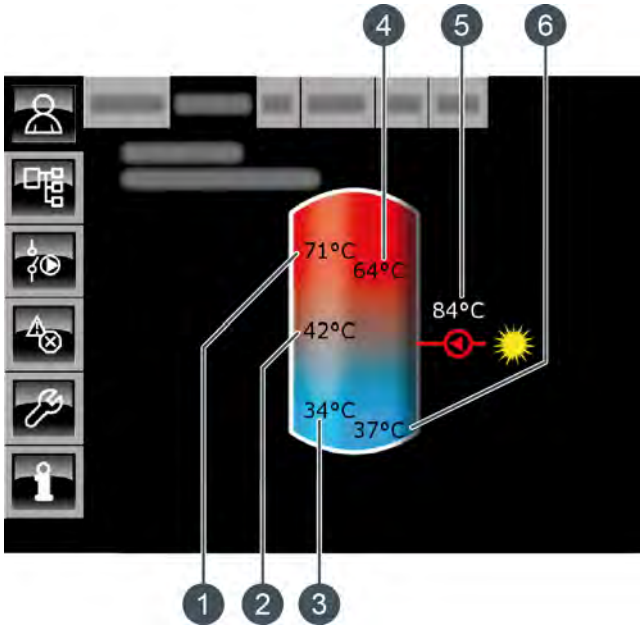


Fig. 7-7: Buffer with solar heating system and stratified charging valve

1 Temperature [Buffer top]
2 Temperature [Buffer middle]
3 Temperature [Buffer bottom]
4 Temperature [Buffer top Solar]
5 Charging by solar heating system, temperature [Collector]
6 Temperature [Buffer bottom Solar]

The stratified charging valve on the buffer storage tank switches solar charging between [Buffer bottom] and [Buffer top]. During this process, the [Buffer top Solar] and [Buffer bottom Solar] temperatures are continuously compared with the current [Collector] temperature.

The solar charging symbol is shown at the top or centre of the buffer, depending on which part of the buffer is currently being charged.

Combination tank (buffer with integrated hot water tank or coil)

Optional: for [Combin. tank]

If a combination tank (i.e. a buffer with integrated hot water tank or internal water heat exchanger) is installed, the hot water temperature is shown in the overview screen in the upper part of the buffer.

Additionally, a second timer [HW charging times] is displayed, which is used to set the hot water temperatures and charging times (see page 32). The [Extra charge] button is also displayed, for charging hot water outside the time slots.

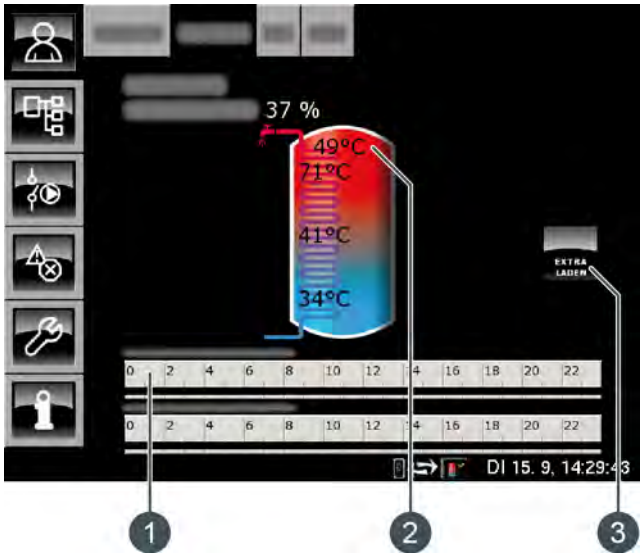


Fig. 7-8: Combination tank

1 Timer [HW charging times]
2 Temperature [Hot water tank]
3 [Extra charge] button

The configurable [Switch-on diff.] parameter additionally allows you to determine how far the current [Hot water tank] temperature can drop before the hot water tank again demands heat from the buffer (see page 37).

7.3.2 Operating modes

Charged

The buffer is charged to the required [Buffer target] temperature, and the [Buffer bottom] temperature sensor has exceeded the configurable [Buff. bottom off] temperature once.

Demand

The buffer is demanding heat from the heat producer.

Chrg.

The boiler is supplying heat to the buffer.

FreezeProt

A temperature sensor in the tank has fallen below the [FreezeProt] temperature.

The frost protection limit is factory-set to 5°C.

ResidHeat

After the boiler heating phase, its residual heat is conveyed to the tank.

Heat dissipation

The tank is being charged to discharge excess heat from the boiler.

Sensor error

A temperature sensor is faulty. You can find this temperature sensor in the message list by pressing the button.

Timer off

There is demand by the tank, but the current time is outside the time slot configured in the timer. The tank is therefore not charged.

Extra hot water charge

The [Extra charge] button has been pressed to activate extra charging outside a time slot when a combination tank is installed.

Solar prio.

Solar priority has been activated, and tank charging by the boiler is disabled. The current time is inside a configured time slot for solar priority, and the current outside temperature is higher than the set temperature [Min. out. temp. Solar prio.].

ChargeBuffer

The combination tank is demanding heat from the boiler.

Charge hot water

Only the hot water section of the combination tank is demanding heat. Only the upper section of the combination tank is being charged.

Solar heat diss.

Excess heat is being taken from a buffer that is being charged by a solar heating system.

7.3.3 Operation

Setting the accumulator tank charging times

With the [BufferChrgTimes] timer, you can set 3 different time windows for the accumulator tank for each day of the week. The accumulator tank is only charged by the boiler within a time window. The sole exception is the [Heat dissipation] operating condition.

To set the charging times, tap the [BufferChrgTimes] timer in the overview. A screen opens.

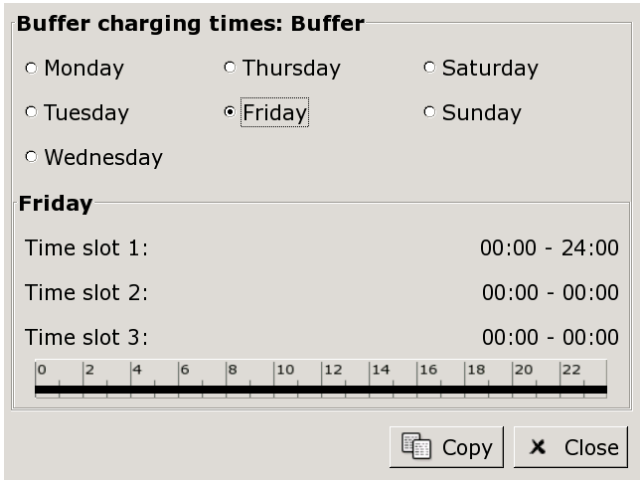


Fig. 7-9: Overview screen of set charging times

You can find further details about setting the time window in chapter 7.1.5 "Setting a time window".

Setting charging times and temperature for hot water with a combination tank

With the combination tank, the additional [HW charging times] timer is used to set 3 different time windows and temperatures for the hot water for each day of the week.

Within a time window, the hot water is charged to the set temperature. Outside a time window, the hot water is charged to the set temperature [Set-back temperature between time slots:].

To set the charging times, tap the [HW charging times] timer in the overview. A screen opens.

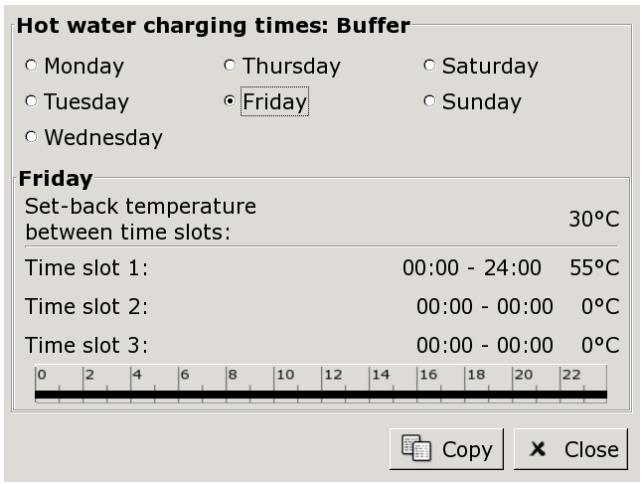


Fig. 7-10: Overview of hot water charging times

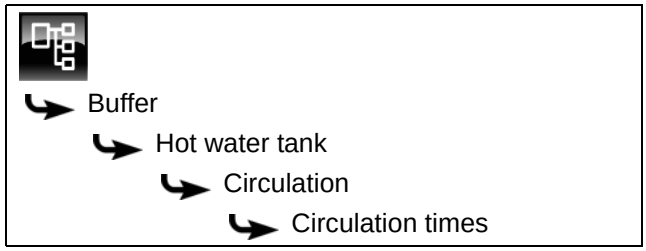
You can find further details about setting the time window in chapter 7.1.5 "Setting a time window".

Setting circulation times with combination tank

Optional: only for combination tank with circulation pump

With a combination tank, the settings of the circulation times are made in the text menu. You can set 3 different time windows for the circulation times of the circulation pump for each day of the week.

Press  to switch to the function block's text menu. The time windows are in:



The individual weekdays are listed.

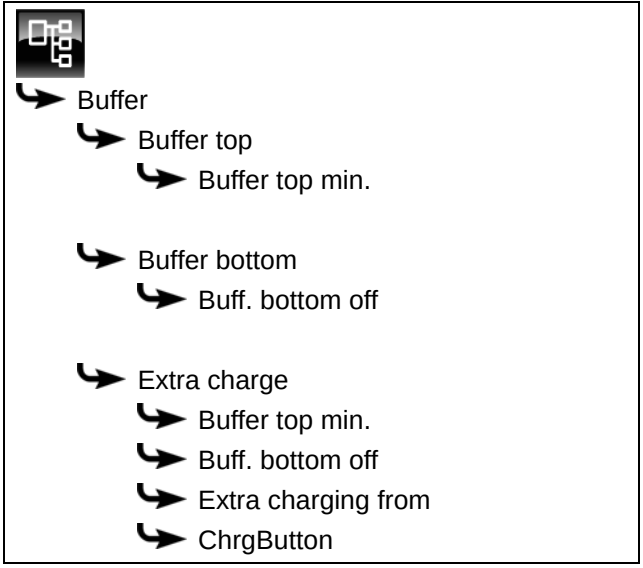
Select a weekday and in the submenu select the desired time window [Time slot 1], [Time slot 2] or [Time slot 3]. Press [Change] to open the settings window.

Set the circulation times to be as short as possible to ensure good buffer stratification and prevent limescale build-up.

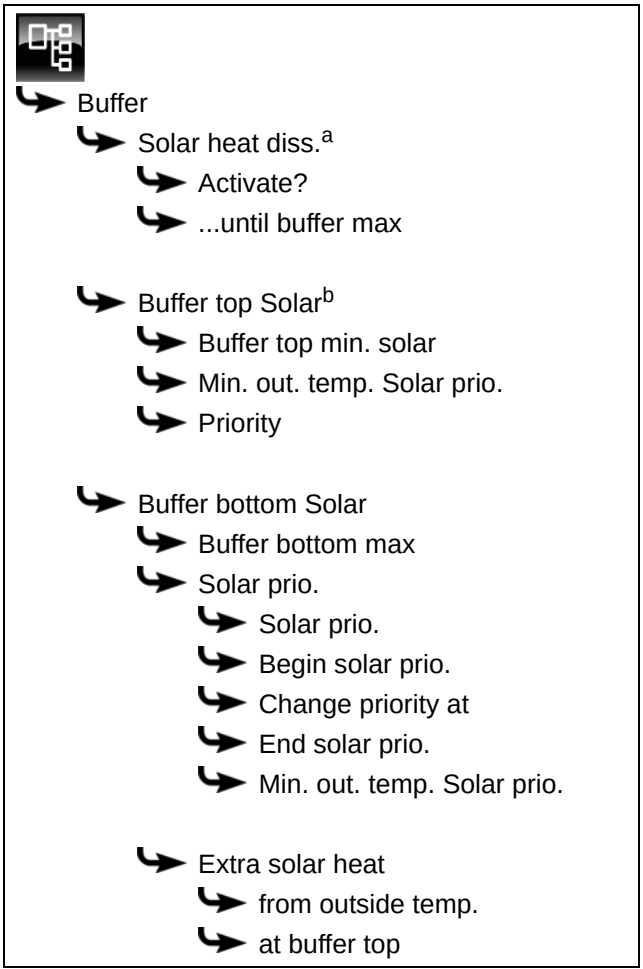
7.3.4 Text menu

Adjustable parameters

The following parameters can be configured for the basic function in the buffer text menu.



If a solar heating system is additionally connected to the buffer, further parameters can be set.

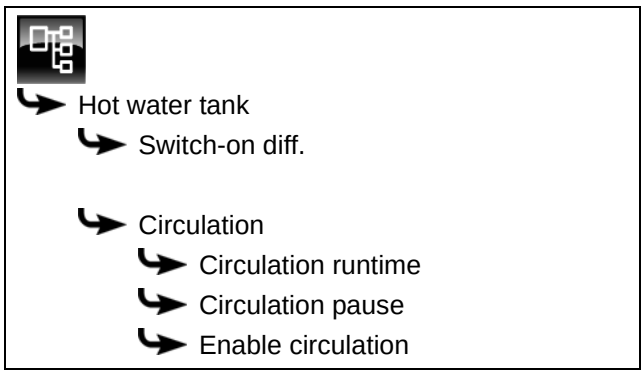


a. Only visible with several buffer storage tanks and solar heating system

b. Only visible with solar heating system and buffer with 2 internal coils

c. Only for solar heating systems with switchover between several tanks

If the buffer is implemented as a combination tank, further parameters can be set.



Detailed descriptions of the parameters are provided below.

7.3.4.4 Buffer top min.

Explanation of [Buffer top min.]

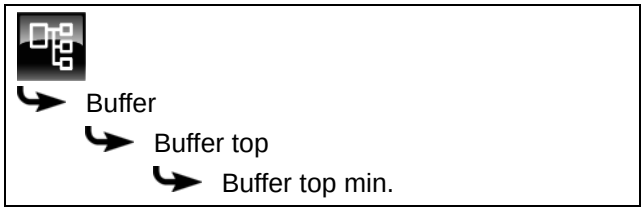
This parameter defines the minimum temperature of the buffer storage tank inside the configured time slot.

This parameter is factory-set to 10°C. The higher this temperature is set, the larger the heat reserve in the buffer. At the same time, however, higher temperatures in the buffer also reduce the solar yield, because the buffer is kept at the [Buffer top min.] temperature using energy from the boiler, even if there is no demand from the consumers.

The factory setting can remain unchanged, as long as all components of the heating system are controlled by the ETA control system. A higher value is required if peaks in output have to be covered, or very fast heat availability is needed.

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.3.4.5 Buff. bottom off

Explanation of [Buff. bottom off]

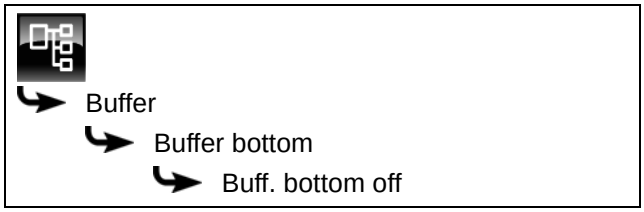
This parameter ends charging of the buffer storage tank by the boiler. As soon as the [Buffer bottom] temperature sensor in the buffer storage tank has exceeded the configured [Buff. bottom off] temperature, charging of the buffer by the boiler is stopped.

This parameter is factory-set to 40°C. The value should be at least 5 - 10°C above the average return temperature of the consumers, but no more than 70°C.

A high [Buff. bottom off] temperature reduces the number of boiler starts and improves boiler running time.

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.3.4.6 Function [Extra charge]

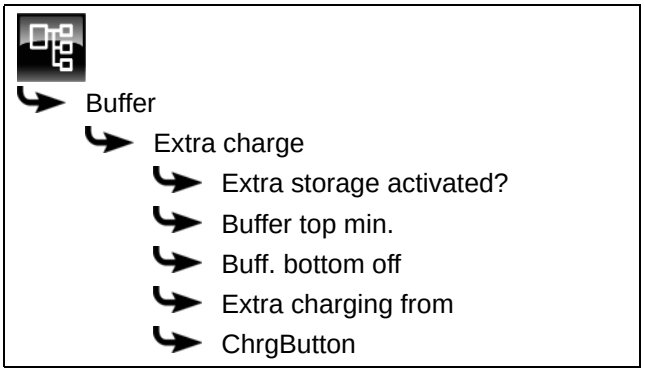
Explanation of the [Extra charge] function

This function defines a daily point in time for the buffer (=[Extra charging from]) to charge the buffer additionally. This charging is done independently of the actual consumer requirements and independently of the set time windows.
A separate minimum temperature [Buffer top min.] and shutdown temperature [Buff. bottom off] can be set for this charge. Charging ends as soon as the buffer reaches these temperatures.

The function is deactivated if one of the two temperatures is set to "0".

Setting the function

The parameters can be found under:



At first, set the parameter [Extra storage activated?] to [Yes], than the other parameters will be displayed.

Select temperatures [Buffer top min.], [Buff. bottom off] and the time [Extra charging from] and press [Change]. In the settings window, set the desired values and save them with [Accept].

To immediately start this additional buffer charge, simply set parameter [ChrgButton] to [On].

7.3.4.7 Solar heat diss.

Explanation of the [Solar heat diss.] function

Optional: Only for several buffer storage tanks and solar heating system

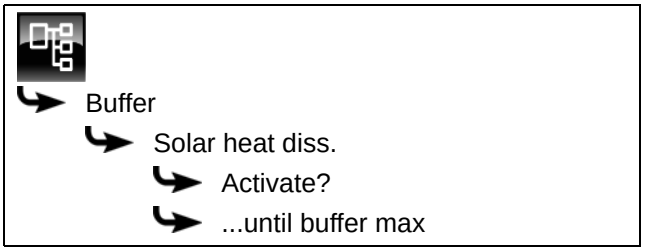
This function defines whether the selected buffer may take up excess solar heat from a buffer charged by the solar heating system.

If you set the function with the [Activate?] parameter set to [Yes], this buffer takes up the solar excess. This buffer is then charged up to the configured maximum temperature [...until buffer max].

As the factory setting, this function is switched off and the maximum temperature [...until buffer max] is limited to 70°C .

Activating the function

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Make your selection and press the [Accept] button to save.

7.3.4.8 Priority of the upper and lower sections

Explanation of [Priority]

Optional: Only with solar heating system and buffer with 2 internal coils

This parameter sets the priority of the top and bottom sections of the buffer for solar charging. A high priority means that this section will be charged by the solar heating system first. A low priority means that it will be charged last.

The priority for the top section is factory-set to [High], and to [Middle] for the bottom section.

Modifying parameters

The priority for the top section is under:


Buffer
Buffer top Solar
Priority

Select the parameter and press the [Change] button. A settings window will open.

Make your selection and press the [Accept] button to save.

Set the priority for the bottom section of the buffer in the same way. You will find this in:


Buffer
Buffer bottom Solar
Priority

7.3.4.9 Buffer top min. solar

Explanation of [Buffer top min. solar]

Optional: Only for solar heating panels with stratified charging

With stratified charging by the solar heating system, this sets a minimum temperature for the top section of the buffer.
This way, solar charging only takes place in the top section once the solar panel is at least 7°C warmer than [Buffer top min. solar].

However, this minimum temperature only applies if the conditions for stratified charging are satisfied. If they are not, solar charging is switched to the bottom section of the buffer, to make use of the solar energy.

This parameter is factory-set to 30°C.

Modifying parameters

The parameter can be found under:


Buffer
Buffer top Solar
Buffer top min. solar

Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.3.4.10 Min. out. temp. Solar prio.

Explanation of [Min. out. temp. Solar prio.]

This parameter sets the minimum value for the outside temperature, so that one of the conditions for solar priority and stratified charging of the buffer storage tank is satisfied.

This value is factory-set to 10°C.

Modifying parameters

The parameter can be found under:


Buffer
Buffer top Solar
Min. out. temp. Solar prio.

or also in:


Buffer
Buffer bottom Solar
Solar prio.
Min. out. temp. Solar prio.

Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.3.4.11 Buffer bottom max

Explanation of [Buffer bottom max]

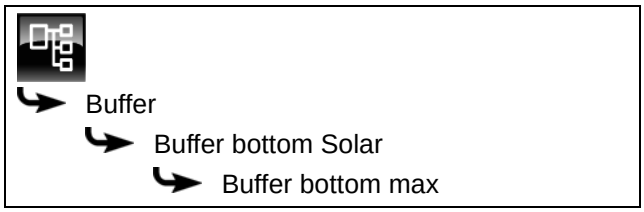
Optional: Only with solar heating systems

This switch-off temperature can only be set when the solar heating system is charging the buffer. This configurable temperature sets a threshold for how much the buffer can be charged by the solar heating system, in order to prevent the buffer from overheating. If the [Buffer bottom Solar] temperature sensor reaches the configured [Buffer bottom max] temperature, the solar panel pump of the solar heating system is switched off.

This parameter is factory-set to 90°C.

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.3.4.12 Solar prio.

Explanation of [Begin solar prio.], [Change priority at] and [End solar prio.]

Optional: Only with solar heating systems

These parameters set the time slots for the [Solar prio.] function.

The first time slot lasts from [Begin solar prio.] to [Change priority at]. The second time slot begins with [Change priority at] and ends with [End solar prio.].

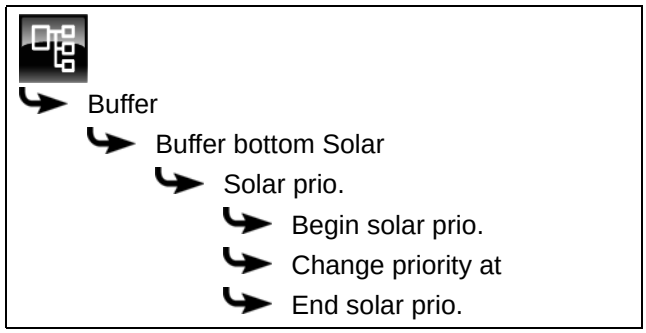
Outside the 2 time slots, the boiler can charge the buffer at any time.

Set the start of solar priority before the first time slot of the heating circuit and hot water tank. Otherwise, the boiler may start beforehand, in order to charge the heating circuit or hot water tank.

During the configured times for solar priority, it may happen that the heating circuits or the hot water are not supplied with sufficient heat.

Setting a time window

The parameters for setting the 2 time windows are in:



Select the parameter and press the [Change] button. A settings window will open.

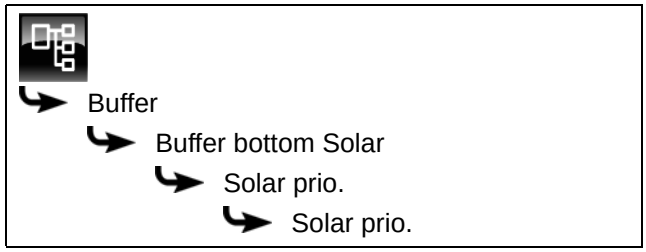
Enter the value and press the [Accept] button to save.

Set the start of solar priority before the first time window of the heating circuit and hot water tank. Otherwise, the boiler may start beforehand, in order to charge the heating circuit or hot water tank.

During the configured priority times, it may be the case that the heating circuits or the hot water are not supplied with sufficient heat.

Switch function on or off

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Make your selection and press the [Accept] button to save.

7.3.4.13 Extra solar heat

Explanation of [Extra solar heat]

Optional: Only with solar heating systems

This function defines whether the buffer storage tank may convey this excess heat from the solar heating system to other consumers, even if they do not currently require any heat.

The following conditions must be met in order for the excess solar heat to be passed on in this way:

- The outside temperature must have exceeded the configurable value [from outside temp.] (factory setting 10°C).

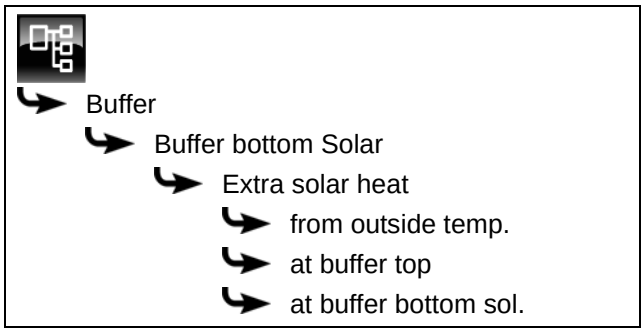
- The [Buffer top] temperature in the buffer must have exceeded the configurable value of [at buffer top] (factory setting 100°C).
- The [Buffer bottom Solar] temperature in the buffer must have exceeded the configurable value of [at buffer bottom sol.] (factory setting 50°C).
- In the function block for the hot water tank, heating circuits or other buffer storage tanks. the [Solar heat diss.] parameter must be set to [Yes], so that the buffer can request these consumers to take on the excess solar heat.

The parameters [from outside temp.], [at buffer top] and [at buffer bottom sol.] can be configured in the buffer text menu.

The [Solar heat diss.] parameter can be configured in the text menu of the [HW] or [HC] function block.

Changing the conditions

The parameters can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.3.4.14 Priority of the buffer

Explanation of [Priority]

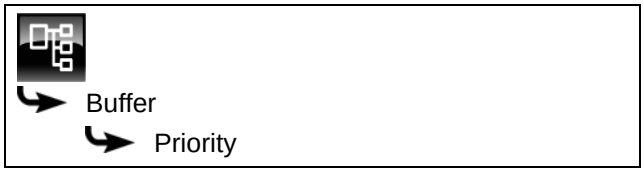
Optional: Only for solar heating systems with switchover between several tanks

This parameter sets the priority for solar charging of the buffer. A high priority means that this tank will be charged by the solar heating system first. A low priority means that it will be charged last.

The priority for the buffer is factory-set to [Middle].

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Make your selection and press the [Accept] button to save.

7.3.4.15 Switch-on diff.

Explanation of [Switch-on diff.]

Optional: only with combination tank

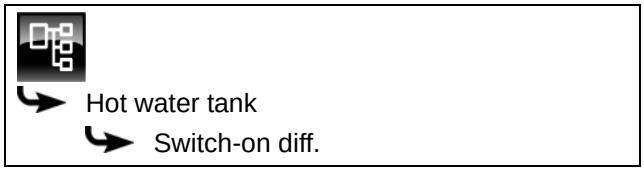
With a combination tank, this parameter regulates how far the current [Hot water tank] temperature can fall before the hot water tank again demands heat from the boiler.

The factory setting for this parameter is 15 °C. The current [Hot water tank] temperature may therefore fall 15 °C from the [Hot water tank target] value. The combination tank does not demand heat from the boiler unless this happens.

With a combination tank, this value can be set to approximately 5 °C to 8 °C if the amount of hot water is insufficient.

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.3.4.16 Circulation runtime

Optional: only for combination tank with circulation pump

Explanation of [Circulation runtime]

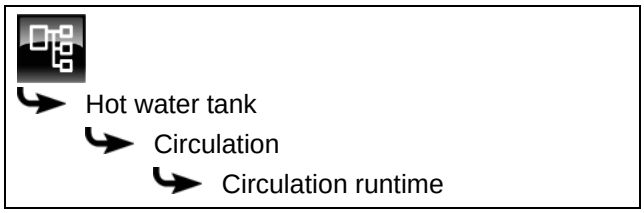
Optional: Only with circulation pump

This parameter sets the duration for operation of the circulation pump after it has been started. This period is only valid inside the set time slot.

After the set period has expired, the circulation pump is switched off for the configurable duration of the [Circulation pause] parameter.

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.3.4.17 Circulation pause

Optional: only for combination tank with circulation pump

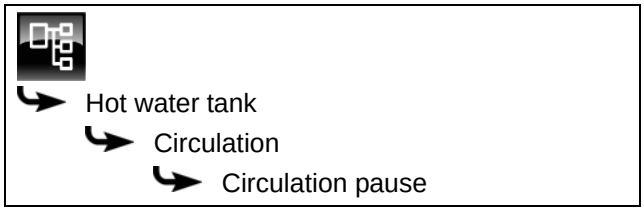
Explanation of [Circulation pause]

Optional: Only with circulation pump

This parameter sets the period (pause) after a circulation pump operating phase. The control system can only restart the circulation pump after this time has elapsed. This pause is only valid inside the set time slot.

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.3.4.18 Enable circulation

Optional: only for combination tank with circulation pump

Explanation of [Enable circulation]

Optional: Only with circulation pump

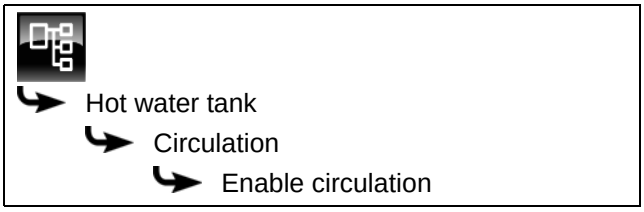
This parameter defines the minimum temperature of the hot water tank for starting the circulation pump. The circulation pump only starts once the hot water tank has exceeded this temperature.

This value is factory-set to 40°C.

Modifying parameters

The [Service] access level is required to perform modifications.

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

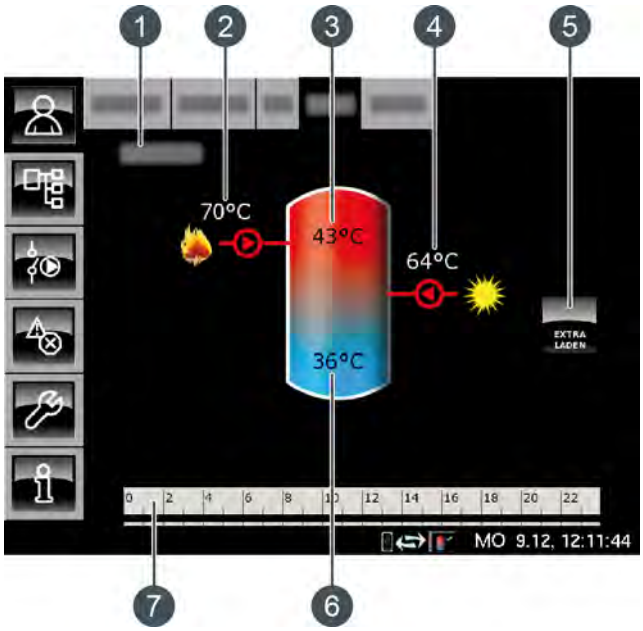
Enter the value and press the [Accept] button to save.

7.4 [Hot water tank] function block

7.4.1 Overview

Hot water tank overview screen

Press the button and [HW] to open the hot water tank overview screen. Here, the current temperatures and operating mode are displayed.



1 Operating mode
2 Charging by boiler
3 Temperature: Hot water
4 Charging by solar heating system
5 [Extra charge] button
6 Temperature: Hot water tank bottom
7 Timer: ChrgTimes

[Extra charge] button

This button causes the hot water tank to be charged to the highest set temperature of all time slots and days of the week if the temperature has dropped below [Switch-on diff.], ignoring the current time slot.

Charging by boiler or buffer

This symbol is displayed when the hot water tank is being charged by the boiler or buffer.
The displayed temperature is the [Boiler] or [Buffer top] temperature.

Charging by the solar heating system

Optional: for solar heating system

This symbol indicates that the tank is being charged by the connected solar heating system. The displayed temperature corresponds to the temperature of the collector.

Hot water tank with solar heating system

Solar charging of the hot water tank is controlled by the solar panel pump switching on and off. Solar charging begins as soon as the [Collector] temperature is 7°C higher than the [Hot water tank bottom] temperature. The solar charging symbol  appears in the overview screen.

If the difference between the [Collector] and [Hot water tank bottom] temperatures is less than the threshold value of 3°C, solar charging stops.

Timer [HW charging times]

This timer displays the set charging times of the current day for charging the hot water tank. These time windows are displayed as a black bar in the timer.

Timer [Circulation times]

Optional: for [Circulation pump]

This timer displays the set times of the current day to operate the circulation pump. These time windows are displayed as a black bar in the timer.

Lower part of hot water tank

Optional: For [Hot water tank bottom] or [Solar]

The temperature in the lower part of the hot water tank is only displayed if the additional temperature sensor [Hot water tank bottom] is installed.

How the hot water tank works

You can set different time slots and temperatures for each day of the week for charging the hot water tank. Inside a time slot, the hot water tank is charged to the configured temperature (see page 42).

Charging commences as soon as the current [Hot water] temperature is below the temperature set in the timer by the configurable value [Switch-on diff.]. The hot water tank then demands heat from the buffer or boiler.
Charging ends as soon as the current [Hot water] temperature has reached the temperature set in the timer. The operating mode then changes to [Charged].

If an additional temperature sensor [Hot water tank bottom] is installed for the lower part of the hot water tank, charging ends as soon as this sensor has reached the configurable temperature [HW bottom off].

If you also wish to charge the hot water tank outside the time slot, press the [Extra charge] button.

If a circulation pump is configured for the hot water, a second timer [Circulation times] is displayed for setting the operating times.

7.4.2 Operating modes

Demand

The hot water tank demands heat from the buffer or boiler. If the boiler is switched on and the buffer is unable to deliver sufficient heat, the boiler switches to heating mode.

Chrg.

The hot water tank is being charged by the boiler or buffer.

Extra charge

The [Extra charge] was pressed for charging the hot water tank outside the set time slots.

Delay

The charging pump of the hot water tank continues running briefly to discharge excess heat from the boiler.

Charged

The hot water tank has reached the set temperature [Hot water tank target].

Heat dissipation

The tank is being charged to discharge excess heat from the boiler.

FreezeProt

A temperature sensor in the tank has fallen below the [FreezeProt] temperature.

The frost protection limit is factory-set to 5°C.

Sensor error

A temperature sensor is faulty. You can find this temperature sensor in the message list by pressing the button.

Timer off

There is demand by the tank, but the current time is outside the time slot configured in the timer. The tank is therefore not charged.

Solar prio.

Solar priority has been activated, and tank charging by the boiler is disabled. The current time is inside a configured time slot for solar priority, and the current outside temperature is higher than the set temperature [Min. out. temp. Solar prio.].

Solar heat diss.

Excess heat is being taken from a buffer that is being charged by a solar heating system.

7.4.3 Operation

Set charging times and temperatures for the hot water tank

The [HW charging times] timer enables you to configure 3 different time windows and temperatures for the hot water tank for each day of the week.

Within a time window, the hot water is charged to the set temperature. Outside a time window, the hot water is charged to the set temperature [Set-back temperature between time slots:].

The [Switch-on diff.] is also taken into consideration for the set temperature [Set-back temperature between time slots:].

To set the charging times, tap the [HW charging times] timer in the overview. A screen opens.

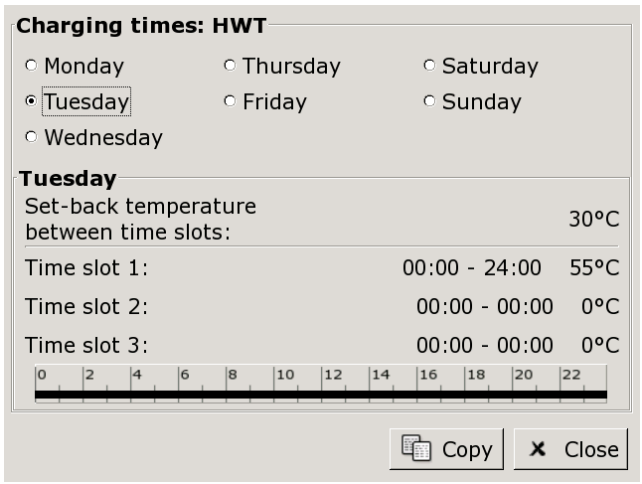


Fig. 7-11: Overview of hot water charging times

You can find further details about setting the time window in chapter 7.1.5 "Setting a time window".

Setting circulation times for the circulation pump

With the [Circulation times] timer, you can set 3 different time windows for the circulation times of the circulation pump for each day of the week.

To set the circulation times, tap the [Circulation times] timer in the overview screen. A screen opens.

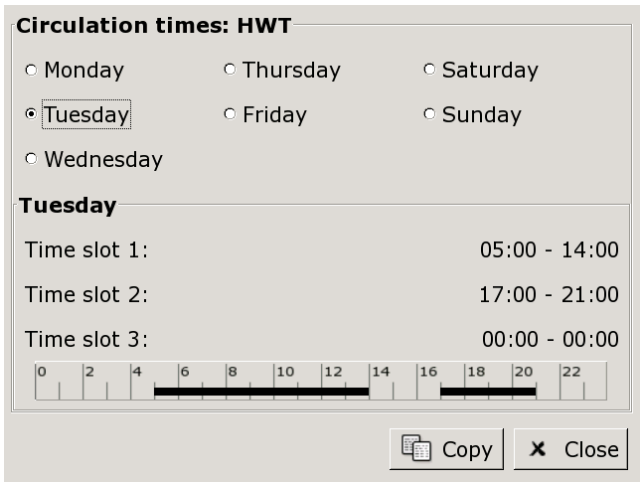


Fig. 7-12: Overview of circulation times

Set the circulation times to be as short as possible to ensure good buffer stratification and prevent limescale build-up.

You can find further details about setting the time window in chapter 7.1.5 "Setting a time window".

7.4.4 Text menu

Adjustable parameters

In function block [HW], switch to the text menu with the button.

- Hot water tank
  - Switch-on diff.
  - HW bottom off[a]
  - Solar heat diss.[b]
  - Priority[c]
- Circulation[d]
  - Circulation runtime
  - Circulation pause

a. Only visible with additional temperature sensor

b. Only visible for buffers with solar heating system

c. Only visible for solar heating systems with switchover between several tanks

d. Only visible with additional circulation pump

Detailed descriptions of the parameters are provided below.

7.4.4.19 Switch-on diff.

Explanation of [Switch-on diff.]

This parameter regulates how far the current [Hot water tank] temperature can fall before the hot water tank again demands heat from the buffer or boiler.

This parameter is factory-set to 15°C. The current [Hot water tank] temperature may therefore fall 15°C below the value [Hot water tank target] set in the time slot. The hot water tank only demands heat from the buffer or boiler when this happens.

Modifying parameters

The parameter can be found under:

- Hot water tank
  - Switch-on diff.

Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.4.4.20 HW bottom off

Explanation of [HW bottom off]

Optional: Only with additional [Hot water tank bottom] temperature sensor

This parameter defines when charging of the hot water tank will end.

As soon as the additional [Hot water tank bottom] temperature sensor in the hot water tank reaches the adjustable [HW bottom off] temperature, charging of the hot water tank ends.

This parameter is factory-set to 10°C.

Modifying parameters

The parameter can be found under:

- Hot water tank
  - HW bottom off

Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.4.4.21 Solar heat diss.

Explanation of [Solar heat diss.]

Optional: Only for buffers with solar heating system

This parameter defines whether the hot water tank may take excess solar heat from the buffer.
If this parameter is set to [Yes], the hot water tank takes the solar excess up to the maximum temperature [Hot water tank max.].

This parameter is factory-set to [No].
You must check the conditions for the [Extra solar heat] function in the text menu of the [Buffer] function block.

Modifying parameters

The parameter can be found under:

- Hot water tank
  - Solar heat diss.

Select the parameter and press the [Change] button. A settings window will open.

Make your selection and press the [Accept] button to save.

7.4.4.22 Priority

Explanation of [Priority]

Optional: Only for solar heating systems with switchover between several tanks

This parameter sets the priority for solar charging of the hot water tank. A high priority means that this tank will be charged by the solar heating system first. A low priority means that it will be charged last.

The priority for the hot water tank is factory-set to [High].

Modifying parameters

The parameter can be found under:


Hot water tank
Priority

Select the parameter and press the [Change] button. A settings window will open.

Make your selection and press the [Accept] button to save.

7.4.4.23 Circulation runtime

Explanation of [Circulation runtime]

Optional: Only with circulation pump

This parameter sets the duration for operation of the circulation pump after it has been started. This period is only valid inside the set time slot.

After the set period has expired, the circulation pump is switched off for the configurable duration of the [Circulation pause] parameter.

Modifying parameters

The parameter can be found under:


Circulation
Circulation runtime

Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.4.4.24 Circulation pause

Explanation of [Circulation pause]

Optional: Only with circulation pump

This parameter sets the period (pause) after a circulation pump operating phase. The control system can only restart the circulation pump after this time has elapsed. This pause is only valid inside the set time slot.

Modifying parameters

The parameter can be found under:


Circulation
Circulation pause

Select the parameter and press the [Change] button. A settings window will open.

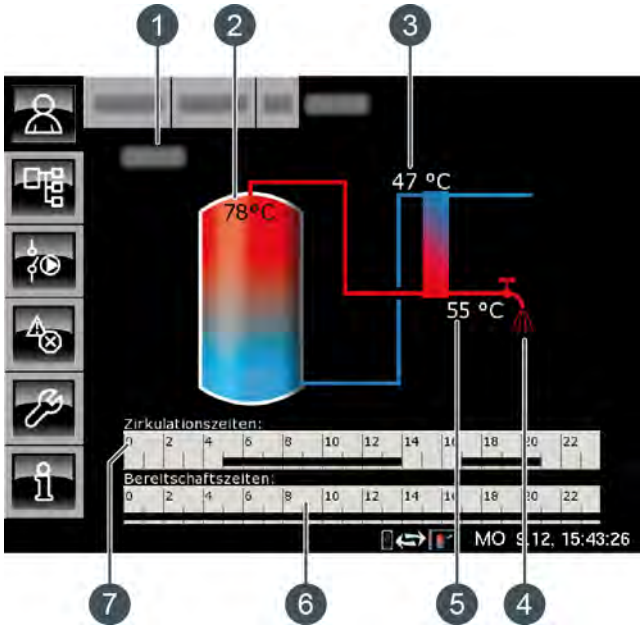
Enter the value and press the [Accept] button to save.

7.5 [Fresh water module] 2 pumps function block

7.5.1 Overview

Overview of the fresh water module (2 pumps)

You can return to the overview by pressing and [FWM].



1 Operating condition
2 Temperature [Buffer top]
3 Temperature [Primary return]
4 Display of hot water uptake
5 Temperature [Hot water]
6 Timer [Stand-by times]
This only appears if the hot water temperature is not set via the potentiometer (option [Target value can be set with rotary knob] is deactivated).
7 Timer [Circulation times]
This only appears if a circulation pump is installed and the [Self-learning] function is deactivated.

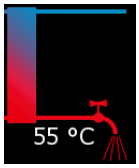
Function of the fresh water module

The desired hot water temperature is set with the potentiometer on the fresh water module. If during the configuration option [Target value can be set with rotary knob] is deactivated, the [Stand-by times] timer appears in the overview. With this you can set different time windows and hot water temperatures for every day of the week.
Inside these time windows, the upper part of the buffer is maintained at no lower than the configured hot water temperature. Outside the set time windows, the hot water is maintained at the lowest configured temperature of the 3 time slots, provided that the buffer is sufficiently hot.

If a circulation pump is installed for the hot water, it will be put into operation as "self-learning" by default. This means that the hot water taps of the last 2 weeks are stored. The operating times of the current day will be calculated from this and the circulation pump is started accordingly.
If this function is turned off, in the overview the timer [Circulation times] appears for manual setting of the operating times.

After commissioning, no more data is available for the "self-learning" circulation. That is why an operating period of about 4 weeks is required in the beginning, so that the control system can save sufficient data.

Heat exchanger

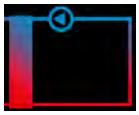


The tap symbol next to the heat exchanger is only displayed if the fresh water module is feeding hot water into the water mains. The temperature shown next to this is the temperature of the hot water currently being supplied.

If no hot water is being supplied, the heat exchanger is shown blue all the way through.

Circulation pump in operation

Optional: for [Circulation pump]



The pump symbol next to the heat exchanger appears when the circulation pump for hot water is in operation.

Timer [Stand-by times]

This is only displayed if option [Target value can be set with rotary knob] is deactivated

This timer displays the set charging times of the current day for charging the hot water tank. These time windows are displayed as a black bar in the timer.

Timer [Circulation times]

This only appears if a circulation pump is installed and the [Self-learning] function is deactivated.

This timer displays the set times of the current day to operate the circulation pump. These time windows are displayed as a black bar in the timer.

7.5.2 Operating modes

Ready

No hot water is currently being taken.

Working

Hot water is currently being supplied.

Buffer cold

Hot water is being supplied, but the buffer is not hot enough to reach the configured hot water temperature.

Primary return too warm

Hot water is being supplied, but the configured hot water temperature is being reduced because the [Primary return] temperature in the heat exchanger of the fresh water module is too high.

Malfunction

There is a fault in a temperature sensor of the fresh water module.

Circulation

The circulation pump is in operation.

Venting

The controller has found air in the fresh water module and automatic venting is in operation. For this, both pumps are operated at full speed for a short period of time to remove the air from the fresh water module. This can also take place multiple times sequentially.

Emergency operation

The fresh water module is in emergency mode because the admixing pump is defective. Currently, hot water is being delivered but it is only being produced with the buffer pump.

Without the admixing pump, calcification protection of the heat exchangers it not guaranteed. Protracted emergency mode can therefore calcify the heat exchanger.

Ready (Emergency operation)

The fresh water module is in emergency mode because the admixing pump is defective.

Without the admixing pump, calcification protection of the heat exchangers it not guaranteed. Protracted emergency mode can therefore calcify the heat exchanger.

7.5.3 Operation

Setting charging times and temperatures of the fresh water module

With the [Stand-by times] timer, you can set different time windows and hot water temperatures for the fresh water module for each day of the week.

Within these time windows, the upper part of the accumulator tank is maintained at no less than the set hot water temperature.
Outside the set time windows, the hot water is maintained at the lowest set temperature of the 3 time windows, provided that the accumulator tank is sufficiently hot.

To set the charging times and temperatures, tap the overview screen on the [Stand-by times]  timer. A screen opens.

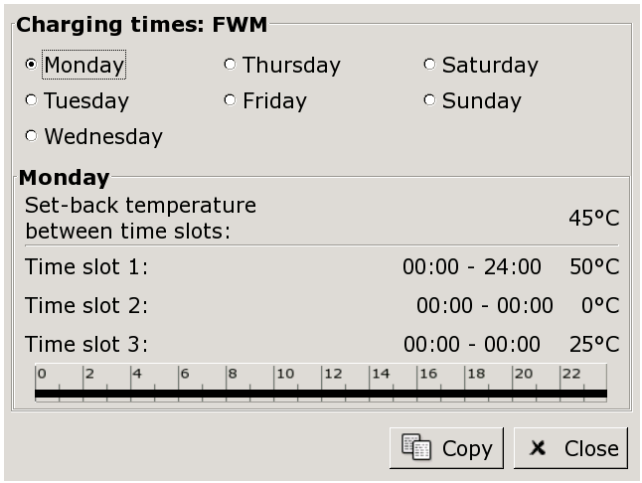


Fig. 7-13: Overview of hot water charging times

Set the hot water temperature as low as possible to prevent limescale build-up.

You can find further details about setting the time window in chapter 7.1.5 "Setting a time window".

Setting circulation times for the circulation pump

With the [Circulation times] timer, you can set 3 different time windows for the circulation times of the circulation pump for each day of the week.

To set the circulation times, tap the [Circulation times] timer in the overview screen. A screen opens.

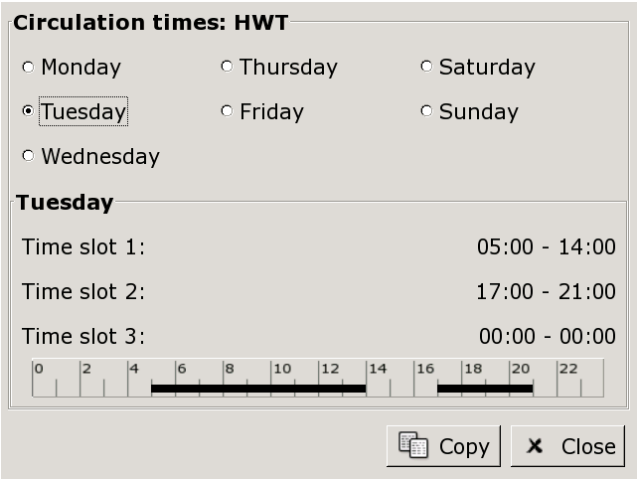


Fig. 7-14: Overview of circulation times

Set the circulation times to be as short as possible to ensure good buffer stratification and prevent limescale build-up.

You can find further details about setting the time window in chapter 7.1.5 "Setting a time window".

7.5.4 Text menu

Adjustable parameters

In function block [FWM], switch to the text menu with the button.

- Hot water
  - Automatic venting
  - Emergency operation only with buffer pump
- Circulation
  - Self-learning
  - Circulation runtime
  - Circulation pause

Detailed descriptions of the parameters are provided below.

7.5.4.25 Function Automatic venting

Explanation of [Automatic venting]

This function attempts to remove introduced air from the fresh water module automatically.
If the function is activated and the controller detects air intake, both pumps are operated at full speed for a short period of time to remove the air from the fresh water module. This can also take place multiple times sequentially.

This function is activated by default. During venting, the hot water can briefly be hotter than the target temperature set.

Modifying parameters

The parameter can be found under:

- Hot water
  - Automatic venting

Select the parameter and press the [Change] button. A settings window will open.

Make your selection and press the [Accept] button to save.

7.5.4.26 Function Emergency operation only with buffer pump

Explanation of the [Emergency operation only with buffer pump] function

Emergency operation of the fresh water module can be activated with this function if the admixing pump is defective.
If it is activated, water heating is only provided by the buffer pump. Without the admixing pump, calcification protection of the heat exchangers is not guaranteed Protracted emergency mode can therefore calcify the heat exchanger.

This function is set to [No] by default.

Modifying parameters

The [Service] access level is required to perform modifications.

The parameter can be found under:


Hot water
Emergency operation only with buffer pump

Select the parameter and press the [Change] button. A settings window will open.

Make your selection and press the [Accept] button to save.

7.5.4.27 Function Self-learning

Explanation of the [Self-learning] function

With this function, the operating times of the circulation pump of the last 2 weeks are saved. The operating times of the current day are calculated based on this and the circulation pump will be put into operation accordingly.

This function is set to [Yes] at the factory. If [No] is set, the timer appears for manual setting of the operating times in the overview.

Modifying parameters

The parameter can be found under:


Circulation
Self-learning

Select the parameter and press the [Change] button. A settings window will open.

Make your selection and press the [Accept] button to save.

7.5.4.28 Circulation runtime

Explanation of [Circulation runtime]

Optional: Only with circulation pump

This parameter sets the duration for operation of the circulation pump after it has been started. This period is only valid inside the set time slot.

After the set period has expired, the circulation pump is switched off for the configurable duration of the [Circulation pause] parameter.

Modifying parameters

The parameter can be found under:


Circulation
Circulation runtime

Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.5.4.29 Circulation pause

Explanation of [Circulation pause]

Optional: Only with circulation pump

This parameter sets the period (pause) after a circulation pump operating phase. The control system can only restart the circulation pump after this time has elapsed. This pause is only valid inside the set time slot.

Modifying parameters

The parameter can be found under:


Circulation
Circulation pause

Select the parameter and press the [Change] button. A settings window will open.

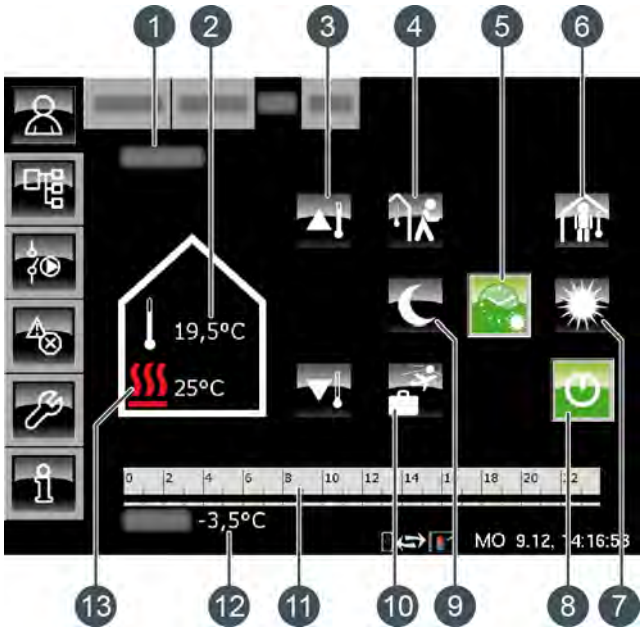
Enter the value and press the [Accept] button to save.

7.6 [Heating circuit] function block

7.6.1 Overview

Heating circuit overview screen

Press the button and [HC] to open the heating circuit overview screen. Each heating circuit can be adjusted in its own function block.



1 Operating mode
2 Current room temperature (only with the [Analogue RmSensor] or [Digital room sensor] option)
3 Slider
4 [away] button
5 [Auto] button
6 [home] button
7 [Day] button
8 [On/Off] button
9 [Night] button
10 [Holiday] button
11 [Heat times] timer
12 Outside temperature
13 [Flow] temperature

How the heating circuit works

Press [On/Off] to switch the selected heating circuit on or off. If the heating circuit is on, this button lights up green.

With the [Heat times] timer, you can set 3 different time slots for each day of the week (see page 55). These time slots are displayed as a black bar in the timer.

Press the [Day], [Auto] or [Night] buttons to swap between the different modes. The selected button then lights up green.

The slider adjusts the flow temperature of the heating circuit, and therefore the room temperature.

[Day] mode

Inside a time slot set with the [Heat times] timer, the heating circuit is in [Day] mode.

If a room sensor is installed, in this mode the heating circuit is set to the highest room temperature configured in the timer for the current day.
If there is no room sensor, the heating circuit runs using the [Day] heating curve.

[Night] mode

Outside a time slot set with the [Heat times] timer, the heating circuit is in [Night] mode.

If a room sensor is installed, in this mode the heating circuit is set to the reduced room temperature [Set-back temperature between time slots:] configured in the timer for the current day.
If there is no room sensor, the heating circuit runs using the [Night] heating curve.

[On/Off] button

This button switches the heating circuit on and off. If the heating circuit is in operation, this button appears green.

Automatic mode [Auto]

This button switches the heating circuit to automatic mode [Auto]. Here, the time slot configured in the [Heat times] timer is used to automatically toggle between the [Day] (inside a time slot) and [Night] (outside a time slot) modes.

The symbol in the button changes depending on whether the heating circuit is currently inside or outside the configured time slot.

= inside a time slot

= outside a time slot

[Day] continuous operation

This button causes the heating circuit to run continuously in [Day] mode, and the time slots set in the [Heat times] timer are ignored.

[Night] continuous operation

This button causes the heating circuit to run continuously in [Night] mode, and the time slots set in the [Heat times] timer are ignored.

Current room temperature

Optional: Only with [Analogue RmSensor] or [Digital room sensor].

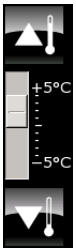
The installed room sensor displays the current, measured room temperature.

[Flow] temperature

The symbol only appears when the heating circuit is switched on.

The current [Flow] temperature for the heating circuit is displayed.

Slider



The slider adjusts the desired room temperature in the range +/- 5°C. You can increase or reduce the room temperature in increments of 0.5°C using the  and  buttons.

If a room sensor is installed, when you press the  and  buttons the target room temperature is displayed instead of the scale.

[Heat times] timer

This timer displays the configured time slot for the [Day] mode of the current day of the week. These time slots are displayed as a black bar in the timer.

[Holiday] mode

This button defines a period of time for switching the selected heating circuit to [Night] mode. The heating circuit is then switched to the lowest temperature configured in the [Heat times] timer.

[home] mode

This function is only available in [Auto] mode. This button switches the heating circuit to [Day] mode until the next configured time slot, ignoring the current set time slot.

Pressing [home] outside a time slot immediately switches the heating circuit to [Day] mode.

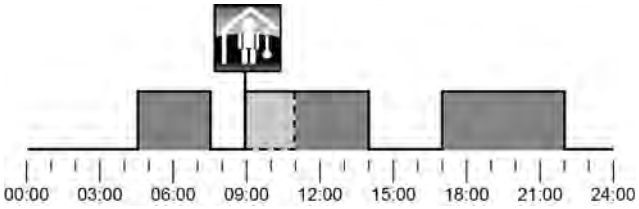


Fig. 7-15: Outside a time slot

Pressing [home] inside a time slot causes the next reduced temperature mode to be skipped.

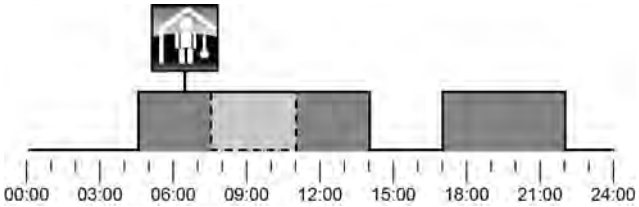


Fig. 7-16: Inside a time slot

[away] mode

This function is only available in [Auto] mode. This button switches the heating circuit to [Night] mode until the next configured time slot, ignoring the current set time slot.

Pressing [away] inside a time slot immediately switches the heating circuit to [Night] mode until the next time slot begins.

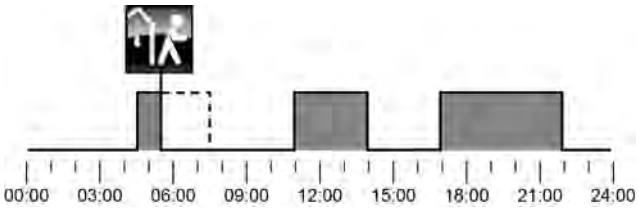


Fig. 7-17: Inside a time slot

Pressing [away] outside a time slot causes the next configured time slot to be skipped.

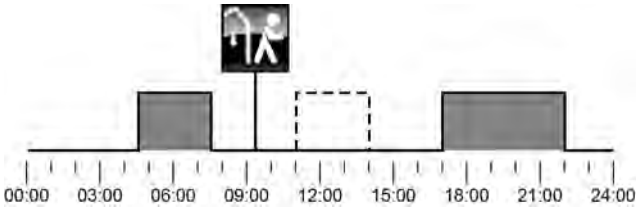


Fig. 7-18: Outside a time slot

7.6.2 Operating modes

Day on

The heating circuit is inside a time slot configured with the [Heat times] timer.

Night on

The heating circuit is outside a time slot configured with the [Heat times] timer.

Holiday on

The heating circuit is inside a holiday period configured with the [Holiday]  button. This mode continues until the end of the configured holiday period.

Enable off

The heating circuit is switched off because the [Boiler] temperature or [Buffer top] is below the required [Enable temperature] temperature.

Day tgt. off

The heating circuit is switched off because the [HeatCurve] temperature calculated on the basis of the [Day] heating curve is either below the room temperature measured by the room sensor, or below the [Off if HeatCurve below] temperature.

If no room sensor is installed, the heating circuit is switched off because the calculated [HeatCurve] temperature is below the required [Off if HeatCurve below] temperature.

Night tgt. off

The heating circuit is switched off because the [HeatCurve] temperature calculated on the basis of the [Night] heating curve is either below the room temperature measured by the room sensor, or below the [Off if HeatCurve below] temperature.

If no room sensor is installed, the heating circuit is switched off because the calculated [HeatCurve] temperature is below the required [Off if HeatCurve below] temperature.

H-day tgt. off

The heating circuit is inside a period configured with the [Holiday]  button. The heating circuit is switched off because the [HeatCurve] temperature calculated on the basis of the [Night] heating curve is either below the room temperature measured by the room sensor, or below the [Off if HeatCurve below] temperature.

If no room sensor is installed, the heating circuit is switched off because the calculated [HeatCurve] temperature is below the required [Off if HeatCurve below] temperature.

Room day off

The heating circuit is within a time slot, but switched off. The current room temperature is higher than the room temperature configured in the [Heat times] timer.

Room night off

The heating circuit is outside a configured time slot, and switched off. The current room temperature is higher than the room temperature configured in the [Heat times] timer.

H-day room off

The heating circuit is inside a period configured with the [Holiday]  button, but switched off. For the current room temperature is higher than the [Set-back temperature between time slots:] temperature configured in the [Heat times] timer.

Day heat. lim. off

The heating circuit is switched off because the current outside temperature is higher than the configured [Day heat. lim.] temperature.

Night heat. lim. off

The heating circuit is switched off because the current outside temperature is higher than the configured [Set-back heat limit] temperature.

H-day heat. lim. off

The heating circuit is inside a period configured with the [Holiday]  button, but switched off. For the current outside temperature is higher than the [Set-back temperature between time slots:] temperature configured in the [Heat times] timer.

Summer off

The heating circuit is switched off with the [On/Off]  button. The only active functions are frost protection, and the pumps' anti-blocking protection, which runs at midday every Saturday.

HW off

The heating circuit is switched off for hot water charging.

RoomFreezeProt on

The heating circuit is in operation because the current room temperature is below the [RoomFreezeProtLimit] temperature.

FlowFreezeProt on

The heating circuit is in operation because the current [Flow] temperature is below the [Flow freeze prot. limit] temperature.

ResidHeat on

The heating circuit does not supply any heat and the pump only continues running briefly, to discharge heat from the boiler.

HeatDiss on

The heating circuit is in operation because the boiler is running at overtemperature. The heating circuit is running at maximum temperature [Flow max].

Screed on

The heating circuit is in operation because the screed drying program is running.

Sensor error on

The heating circuit is in operation, even though the flow temperature sensor has a malfunction. It is running at a lower flow temperature to ensure frost protection.

Solar heat diss.

Excess heat is being taken from a buffer that is being charged by a solar heating system.

Locked off

The heating circuit was switched off by an external signal (= "locked").

7.6.3 The heating curve

Description of the heating curve

The heating curve regulates the flow temperature for the heating circuit. Each heating circuit has its own heating curve, as underfloor heating requires different settings from radiators.

The heating curve is defined by the two configurable parameters [Flow at -10°C] and [Flow at +10°C]. The result is a line: the [Day] heating curve. Based on the heating curve, the control system calculates the currently required flow temperature for the heating circuit in [Day] mode, depending on the current outside temperature. For example, an outside temperature of +3°C would result in a flow temperature of 45°C (see diagram below).

If a room sensor is installed for the heating circuit, the flow temperature calculated on the basis of the heating curve is corrected. The actual flow temperature will then differ from the calculated value.

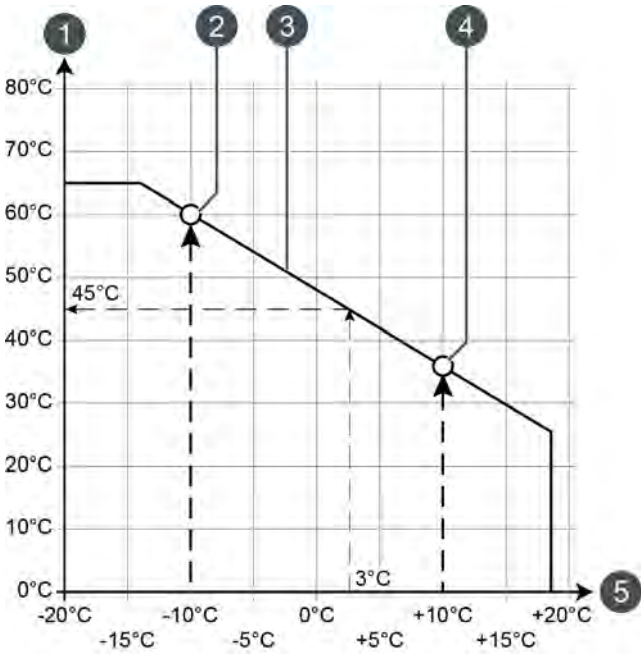


Fig. 7-19: [Day] heating curve

1 Flow temperature scale
2 Configurable parameter [Flow at -10°C]
3 [Day] heating curve
4 Configurable parameter [Flow at +10°C]
5 Outside temperature scale

The heating curve for [Night] mode is determined by a parallel shift of the [Day] heating curve. This shift is set via the [Set-back] parameter (see page 56).

The flow temperature for [Night] mode is determined on the basis of the outside temperature and the [Night] heating curve.

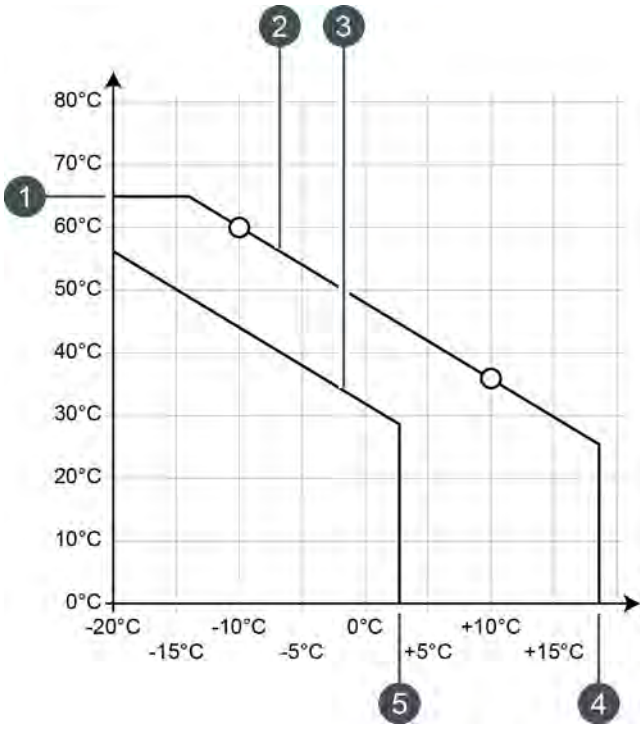


Fig. 7-20: [Night] heating curve

1 [Flow max]
2 [Day] heating curve
3 [Night] heating curve
4 [Day heat. lim.]
5 [Set-back heat limit]

If the current outside temperature exceeds the configured [Day heat. lim.] temperature in [Day] mode, the heating circuit is shut off. The same applies to [Night] mode, if the outside temperature exceeds the [Set-back heat limit] temperature. To set these parameters, see page 57.

The [Flow max] parameter determines the maximum flow temperature for the heating circuit, to protect it from overheating. The factory setting is 45°C for underfloor heating, and 65°C for radiators.

Adjusting the heating curve

If the heating circuit is always too hot or too cold in [Day] mode, you must adjust the heating curve. Do this by adjusting parameters [Flow at -10°C] and [Flow at +10°C].

Only ever make minor adjustments to these parameters: never more than 2°C for underfloor heating, and 4°C for radiators. You may need to adapt the heating curve again after a couple of days, but if you do it in small increments, it is more precise and energy efficient.

If the heating circuit is always too hot or too cold in [Day] mode in the transitional period (in spring or autumn), only reduce or increase the [Flow at +10°C] parameter.

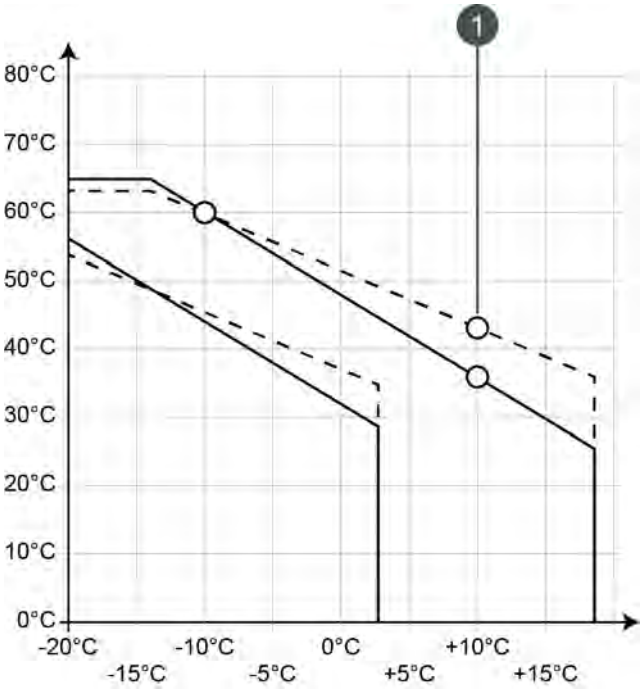


Fig. 7-21: Adjusting the heating curve in the transitional period

1 [Flow at +10°C]

If the heating circuit is always too hot or too cold in [Day] mode in the winter, only reduce or increase the [Flow at -10°C] parameter.

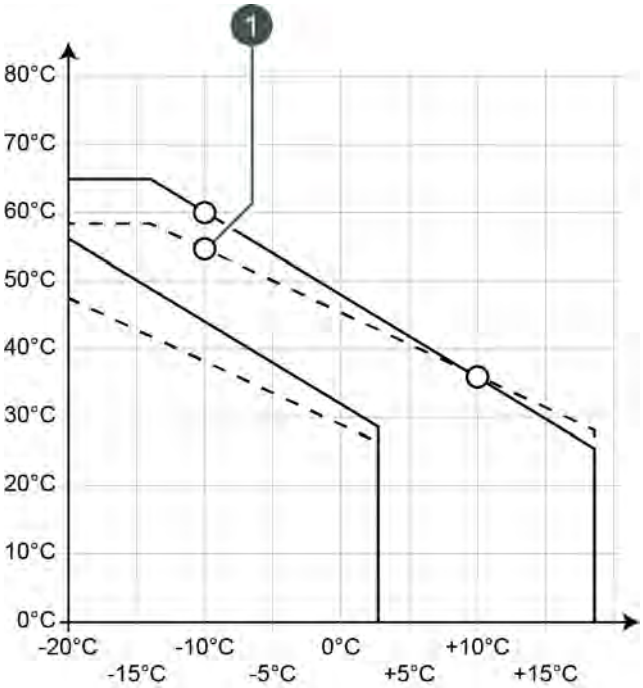


Fig. 7-22: Adjusting the heating curve in the winter

1 [Flow at -10°C]

You can change the parameters [Flow at -10°C] and [Flow at +10°C] in the text menu of the heating circuit in question, see page 56.

If the heating circuit is always too hot or too cold in [Night] mode, you only have to adjust the [Set-back] parameter, see page 56.

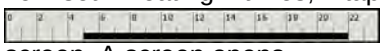
7.6.4 Operation

Setting heating times and room temperatures

With the [Heat times] timer, you can set 3 different time windows for the heating circuit for each day of the week.

Within a time window, the heating circuit is in [Day] mode. Outside a time window, it is in [Night] mode.

If a room sensor is installed, the room temperature can be adjusted within a time window. Likewise, the reduced room temperature [Set-back temperature between time slots:] can be adjusted outside the time window for each day of the week.

To set heating times, tap the [Heat times]  timer in the overview screen. A screen opens.

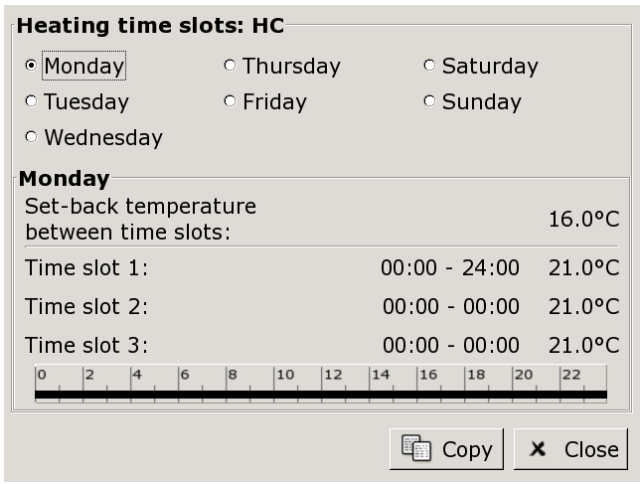


Fig. 7-23: Overview of heating times if a room sensor is installed

You can find further details about setting the time window in chapter 7.1.5 "Setting a time window".

Holiday setting function

When you press the [Holiday]  button, you can define a period during which the selected heating circuit is switched to [Night] mode. The heating circuit is then set to the lowest temperature [Set-back temperature between time slots:] configured in the [Heat times] timer.

To set this function, tap the [Holiday]  button in the overview screen.

A settings screen opens:

Fig. 7-24: Setting the start of the holiday

Enter the date and time for the start of the holiday. Press the button to enter the end of the holiday.

Finally, press [Accept] to save your entries. The heating circuits overview screen appears.

7.6.5 Text menu

Adjustable parameters

Select the respective heating circuit [HC], [HC2]... and press the button to switch to the text menu.

- Heating circuit
  - HeatCurve
    - Flow at -10°C
    - Flow at +10°C
    - Set-back
  - Day heat. lim.
  - Set-back heat limit
  - Solar heat diss.

Detailed descriptions of the parameters are provided below.

7.6.5.30 Flow at -10°C and Flow at +10°C

Explanation of [Flow at -10°C] and [Flow at +10°C]

The two adjustable parameters [Flow at -10°C] and [Flow at +10°C] are used to define the [Day] heating curve.

Based on the current outside temperature , the control system uses the heating curve to calculate the currently required flow temperature for the heating circuit in [Day] mode.

Modifying parameters

The parameters can be found under:

- Heating circuit
  - HeatCurve
    - Flow at -10°C
    - Flow at +10°C

Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.6.5.31 Set-back

Explanation of [Set-back]

This parameter is used to set the parallel shift of the [Day] heating curve, in order to determine the [Night] heating curve.

This parameter is factory-set to 3°C for underfloor heating and 15°C for radiators.
Only make minor changes to this parameter, because when walls cool down too much, dramatically higher air temperatures are required to heat the room. Any energy savings will then be lost.

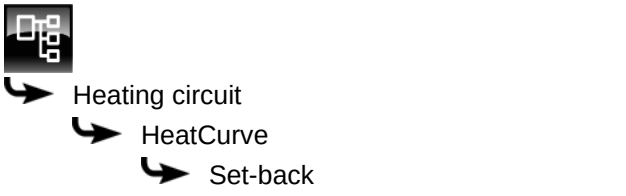
The following figures are a guide, depending on the configured temperature [Flow at -10°C] and the design of the heating circuit:

Temperature	Radiators		
Flow at -10°C	40°C	60°C	80°C
Set-back	5 - 8°C	10-15°C	15-22°C

Temperature	Underfloor heating	
Flow at -10°C	30°C	40°C
Set-back	3°C	5°C

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.6.5.32 Day heat. lim. and Set-back heat limit

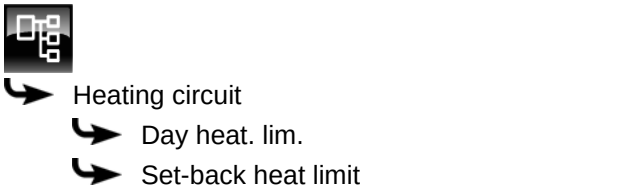
Explanation of [Day heat. lim.] and [Set-back heat limit]

The [Day heat. lim.] and [Set-back heat limit] parameters are used to set outside temperatures at which the selected heating circuit is shut off in [Day] or [Night] mode.

The [Day heat. lim.] parameter is factory-set to 18°C and the [Set-back heat limit] parameter to 2°C.

Modifying parameters

The parameters can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.6.5.33 Solar heat diss.

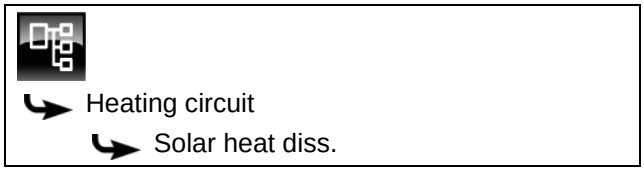
Explanation of [Solar heat diss.]

This parameter defines whether the selected heating circuit may use excess solar heat from the buffer.
If this parameter is set to [Yes], this heating circuit takes on the solar excess. The heating circuit switches itself on and a heating curve is calculated as if for an outside temperature of 0°C.

This parameter is factory-set to [No].
You must check the conditions for the [Extra solar heat] function in the text menu of the [Buffer] function block.

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Make your selection and press the [Accept] button to save.

7.7 [Solar] function block

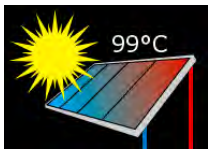
7.7.1 Overview

Versions of solar heating system

Press the button and [Solar] to open the solar heating system overview screen.

The ETAtouch control system is compatible with a great many versions, for enabling the integration of a solar heating system. The various versions are described below.

Solar heating system in operation



This symbol appears while the solar heating system is in operation and is supplying heat. The displayed temperature is the [Collector] temperature.

If the solar panel is displayed on its own without the lines, the solar heating system is switched off.

Priority of the tank or section

The number of stars indicates the configured priority of the tank or section.

3 stars indicate the highest priority. This tank or section is charged by the solar heating system first. One star denotes the lowest priority, so this tank or section is charged last.

If no stars are displayed, this tank or section is already sufficiently charged.

You can set the priority for each tank or section in the text menu of the relevant function block. So, for the buffer, use the buffer text menu.

Solar heating system with one tank

Only one tank is shown in the overview screen, regardless of whether the solar heating system is charging the buffer, the hot water tank or a solar tank (e.g., pool).
The temperature displayed in the tank is [Buffer bottom Solar] for a buffer, [Hot water tank bottom] for a hot water tank and [Current consumer temp.] for a solar tank.

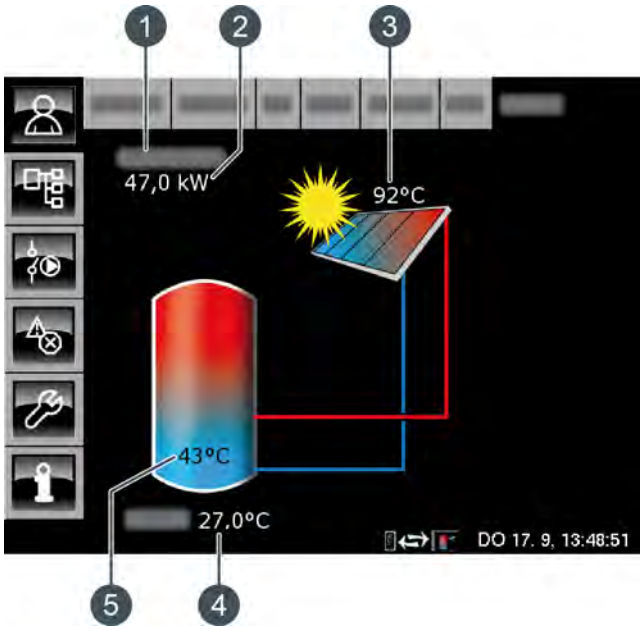


Fig. 7-25: Solar heating system with one tank

1 Operating condition
2 Current output of the solar heating system (only if a heat flow meter is installed)
3 Temperature [Collector]
4 Outside temperature
5 Temperature of tank [Tank 1 bottom]

Control system:

The solar heating system is controlled by switching the collector pump on and off. This is switched on as soon as the collector has exceeded the minimum temperature [Collector min] and is warmer by the difference [Switch-on diff.] (factory setting 7 °C) than the tank being charged.
The speed of the collector pump is controlled in such a way that the collector supplies a temperature that is higher than the current tank temperature by the configurable offset [Target collector diff.].

When the tank has reached its maximum temperature, or if the collector is only warmer by the offset [Switch-off diff.] (factory setting 5 °C) than the tank, the collector pump is switched off.

The maximum temperature is factory-set to 90 °C for the buffer [Buffer bottom max] and 60 °C for the hot water tank [Hot water tank max.].

Solar heating system with several tanks

If the solar heating system is charging more than one tank - buffer and hot water tank, for example - these are shown in the overview screen. The lines always lead to the tank that is currently being charged.

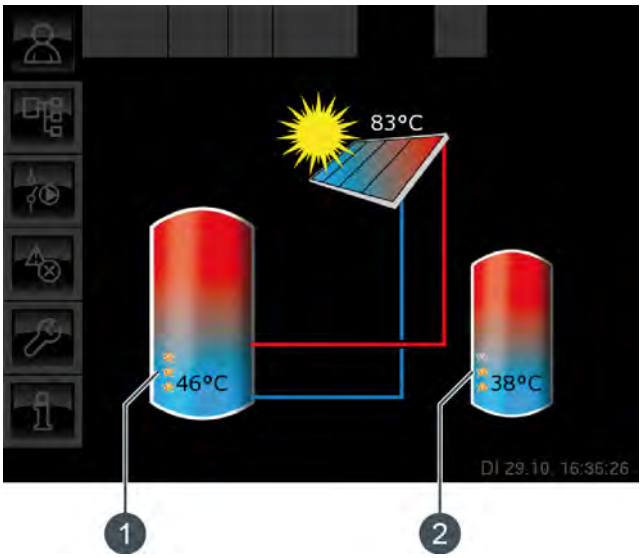


Fig. 7-26: Solar heating system with 2 tanks

1 Priority and temperature of the first tank

2 Priority and temperature of the second tank

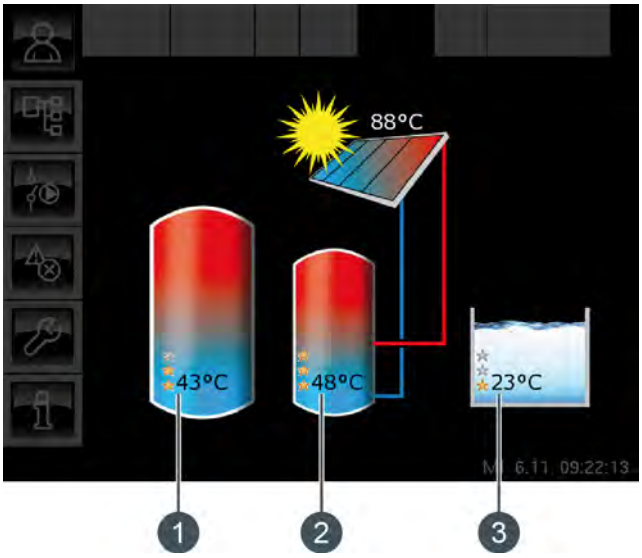


Fig. 7-27: Solar heating system with 3 tanks

1 Priority and temperature of the first tank

2 Priority and temperature of the second tank

3 Priority and temperature of the third tank (here, the [Sol. tank] function block)

Switching between tanks:

The collector pump is switched on as soon as the collector has exceeded the minimum temperature [Collector min] and is warmer by the difference [Switch-on diff.] (factory setting 7°C) than the temperature of the tank with the highest priority.

The sequence for switching from one tank to another is based on the configured priorities. The tank with the highest priority is charged first.

If the solar power is not sufficient for charging the tank with the highest priority (= collector is only warmer by the difference [Switch-off diff.] (factory setting 5 °C) than the tank currently requiring charging), the tank with the next highest priority is charged after the minimum time has elapsed (factory setting 20 minutes).

If the solar power increases once more, after the minimum time has elapsed solar charging switches back to the tank with the higher priority. This ensures that the tank with the highest priority is always charged first.

Uniform charging of tanks without consideration of individual priorities is also possible. However, the [Service] permission is required for this. Then you can use the [Changeover if diff. >] parameter in the solar heating system text menu to configure the temperature difference between the tanks.

Solar heating system for buffer with 2 coils

In the overview screen, the temperatures and configured priorities of the top and bottom sections are displayed.
The collector lines lead to the top or bottom section of the buffer, depending on which section is currently being charged.

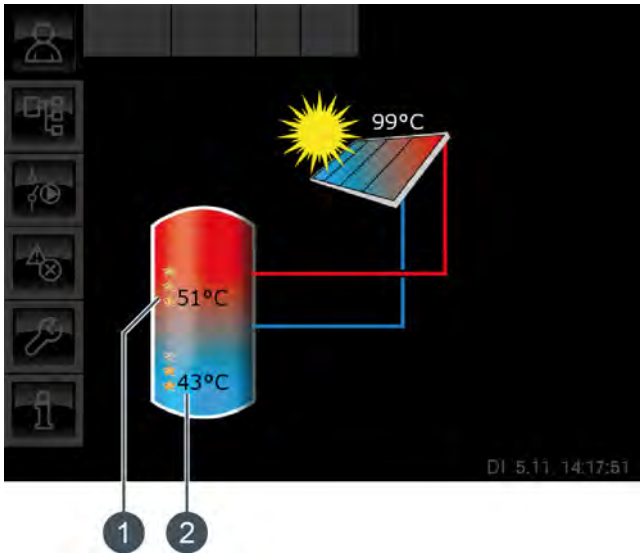


Fig. 7-28: Buffer with 2 coils

1 Temperature [Tank 1 top] and priority of top section
2 Temperature [Tank 1 bottom] and priority of bottom section

The [Tank 1 top] temperature corresponds to [Buffer top Solar] and temperature [Tank 1 bottom] corresponds to [Buffer bottom Solar].

Stratified charging via the solar heating system:

The purpose of stratified charging is to produce a sufficiently high temperature in the top part of the buffer, so that the boiler does not have to start up to provide hot water treatment.

A dedicated target temperature [Buffer target solar] is available for controlling stratified charging. You can find this in the buffer text menu under [Buffer] -> [Buffer top Solar] -> [Buffer target solar].
It is based on the current demand of the consumer or the minimum temperature [Buffer top min. solar].

Stratified charging takes place when the following three conditions are met:

- The boiler is not in operation
- The outside temperature is above 10 °C (factory setting [Min. out. temp. Solar prio.], see page 35)
- Temperature [Tank 1 top] is lower than [Buffer target solar]

The top section has the highest priority by default and is therefore charged first. As long as the [Tank 1 top] temperature is lower than [Buffer target solar], only the top section is charged.
If the solar heating system is supplying too little heat, the collector pump is switched off. It is restarted when the collector has exceeded the minimum temperature [Collector min] and is warmer by the difference [Switch-on diff.] (factory setting 7 °C) than [Buffer top Solar].

Once the top section has been charged up to the target temperature [Buffer target solar], solar charging takes place in the bottom section.
If the [Tank 1 top] temperature falls below the target temperature [Buffer target solar], the top section is charged once more.

The [Buffer top min. solar] parameter is used to set a minimum temperature for the top section of the buffer, see page 35.
This way, solar charging only takes place in the top section once the collector is warmer by the difference [Switch-on diff.] (factory setting 7 °C) than [Buffer top min. solar]. Up until this time, the bottom section of the buffer is charged.

If one of the above conditions is not satisfied, stratified charging does not take place in the top section, and only the bottom section of the buffer is charged.

Solar heating system with external heat exchanger

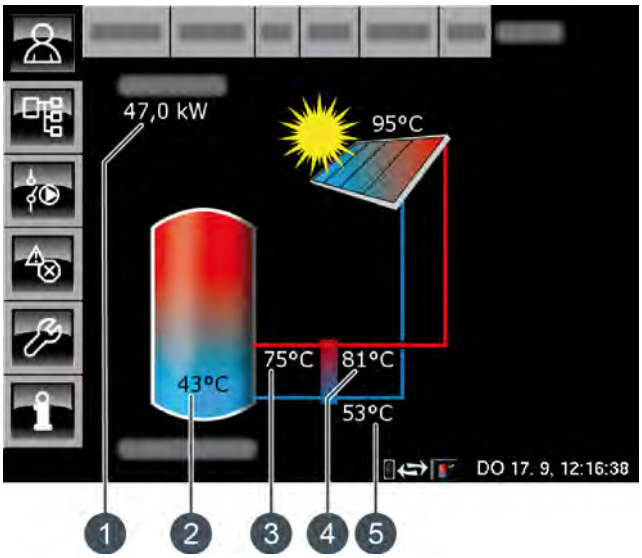


Fig. 7-29: Solar heating system with external heat exchanger

1 Current output of the solar heating system (only if a heat flow meter is installed)

2 Temperature of tank [Tank 1 bottom]

3 Temperature: [Secondary flow]

4 Temperature: [Solar flow] (only if a heat flow meter is installed)

5 Temperature: [Solar return]

Control system:

The collector pump is switched on as soon as the collector has exceeded the minimum temperature [Collector min] and is warmer by the difference [Switch-on diff.] (factory setting 7 °C) than the tank being charged.

The speed of the collector pump is controlled in such a way that the collector supplies a temperature that is higher than the current tank temperature by the configurable offset [Target collector diff.].

If the collector pump is in operation, the secondary pump starts up. This pump tries to adjust the temperature difference between collector and secondary flow (of the heat exchanger) to the temperature difference between the return of the solar heating system and the tank. This is achieved by changing the speed of the secondary pump.

When the tank has reached its maximum temperature, or if the collector is only warmer by the offset [Switch-off diff.] (factory setting 5 °C) than the tank, the collector pump is switched off.

Solar heating system with external heat exchanger and stratified charging valve

The lines of the heat exchanger always lead to the section of the buffer that is currently being charged. The set priorities are displayed at the section which is currently charged.

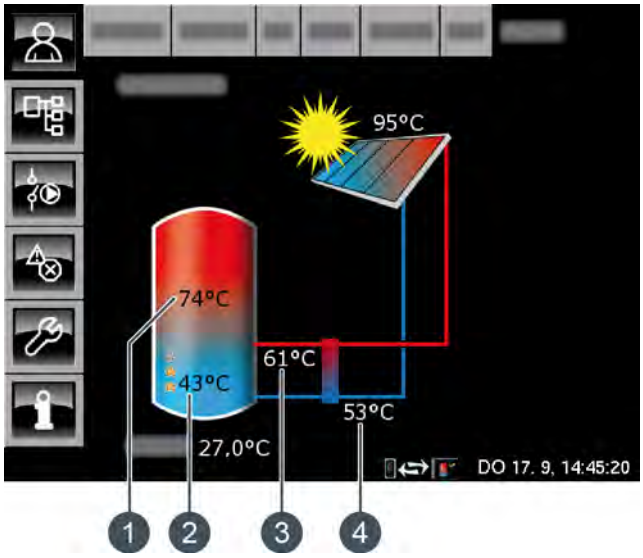


Fig. 7-30: External heat exchanger with stratified charging valve

1 Temperature [Tank 1 top]

2 Temperature [Tank 1 bottom] and priority of bottom section

3 [Secondary flow]

4 [Solar return]

The [Tank 1 top] temperature corresponds to [Buffer top Solar] and temperature [Tank 1 bottom] corresponds to [Buffer bottom Solar].

Stratified charging via the solar heating system:

The purpose of stratified charging is to produce a sufficiently high temperature in the top part of the buffer, so that the boiler does not have to start up to provide hot water treatment.

A dedicated target temperature [Buffer target solar] is available for controlling stratified charging. You can find this in the buffer text menu under [Buffer] -> [Buffer top Solar] -> [Buffer target solar]. It is based on the current demand of consumers and the minimum temperature [Buffer top min. solar].

Stratified charging takes place when the following three conditions are met:

- The boiler is not in operation
- The outside temperature is above 10 °C (factory setting [Min. out. temp. Solar prio.], see page 35)
- Temperature [Tank 1 top] is lower than [Buffer target solar]

The top section has the highest priority by default and is therefore charged first. As long as the [Tank 1 top] temperature is lower than [Buffer target solar], only the top section is charged.
If the solar heating system is supplying too little heat, the collector pump is switched off. It is restarted when the collector has exceeded the minimum temperature [Collector min] and is warmer by the difference [Switch-on diff.] (factory setting 7 °C) than [Buffer top Solar].

Once the top section has been charged to the target temperature [Buffer target solar], solar charging takes place in the bottom section.
After this, stratified charging is controlled based on the [Secondary flow] temperature. If this is at least 2 °C warmer than [Tank 1 top], the top section of the buffer is charged. If the [Secondary flow] temperature is colder than [Tank 1 top], the bottom section of the buffer is charged.

If the [Tank 1 top] temperature falls below the target temperature [Buffer target solar], the top section is charged once more.

The [Buffer top min. solar] parameter is used to set a minimum temperature for the top section of the buffer, see page 35.
This way, solar charging only takes place in the top section once the collector is warmer by the difference [Switch-on diff.] (factory setting 7 °C) than [Buffer top min. solar]. Up until this time, the bottom section of the buffer is charged.

Solar heating system with two solar panels

Both solar panels are always shown in the overview screen. If the second solar panel is also supplying heat, the lines to the tank are displayed for this panel.

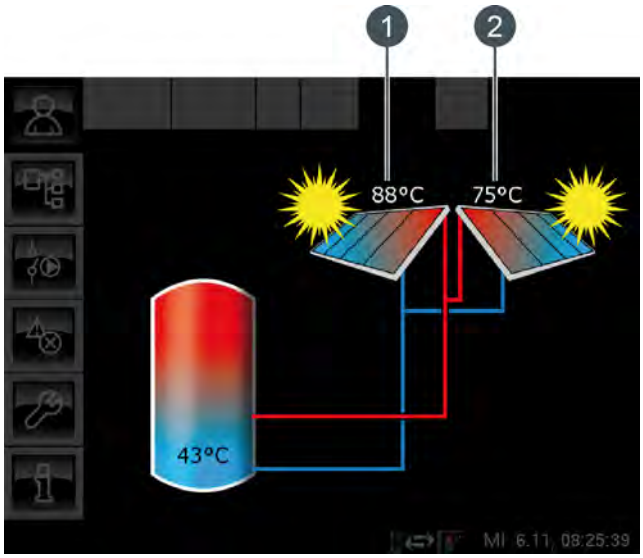


Fig. 7-31: Solar heating system with two solar panels

1 Solar panel 1
2 Solar panel 2

7.7.2 Operating modes

Solar panel temp. too low

The solar heating system is switched off because the solar panel is colder than the temperature in the tank. With a buffer, the [Buffer bottom Solar] temperature is compared. With a hot water tank, it is the [Hot water tank bottom] temperature.

Tank charged

The solar heating system is switched off because the connected tanks are completely charged. The buffer has reached the [Buffer bottom max] temperature (factory setting 90°C), or the hot water tank has reached the [Hot water tank max.] temperature (factory setting 60°C).

Solar panel temp. too high

The solar heating system is switched off because the solar panel has exceeded the configured maximum temperature [Collector max] (factory setting 120°C).

Working

The solar heating system is in operation.

Delay

The solar heating system is switched off, but the secondary pump still continues running briefly.

Emer. op.

There is a fault in the [Secondary flow] or [Solar return] temperature sensor. The solar heating system remains in operation, but is controlled only by the temperature of the solar panel.

Malfunction

There is a fault in the solar panel temperature sensor. The solar heating system is therefore switched off.

7.7.3 Text menu

7.7.3.34 Collector min

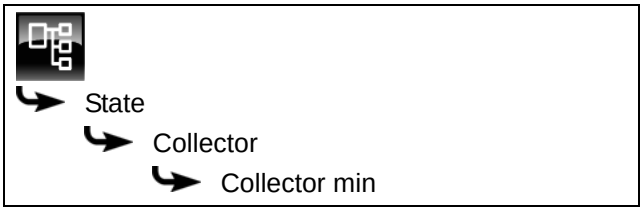
Explanation [Collector min]

This parameter sets the minimum temperature for starting the solar panel pump. The solar panel pump can only be started once the solar panel has exceeded this temperature.

Do not set this temperature too high, to ensure that heat can already be supplied to pre-heat the tank even when there is little sunlight. The ideal range is between 30-50°C. This parameter is factory-set to 30°C.

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.7.3.35 Target collector diff.

Explanation [Target collector diff.]

This parameter sets the desired temperature difference between the solar panel and the connected tank (buffer or hot water tank). This temperature difference is controlled by adjusting the speed of the solar panel pump.

This parameter is factory-set to 10°C.

If the buffer is being charged by the solar heating system, the temperature of the solar panel [Collector] is compared with the buffer temperature [Buffer bottom Solar]. If the hot water tank is being charged, the [Hot water tank bottom] temperature is compared.

A **high temperature difference** results in a low speed of the solar panel pump. This way, a smaller quantity of water is conveyed through the solar panel. The water remains in the solar panel for a longer time, and therefore produces a higher working temperature in the panel. Consequently, a higher hot water temperature is achieved, but there are also more losses from the solar panel.

A **low temperature difference** results in a higher speed of the solar panel pump. A larger quantity of water is therefore conveyed through the solar panel. The water remains in the solar panel for a short time, and so also becomes less hot. The working temperature of the solar panel is therefore lower, but there are fewer losses via the solar panel.

Modifying parameters

The parameter can be found under:


State
Collector pump
Target collector diff.

Select the parameter and press the [Change] button. A settings window will open.

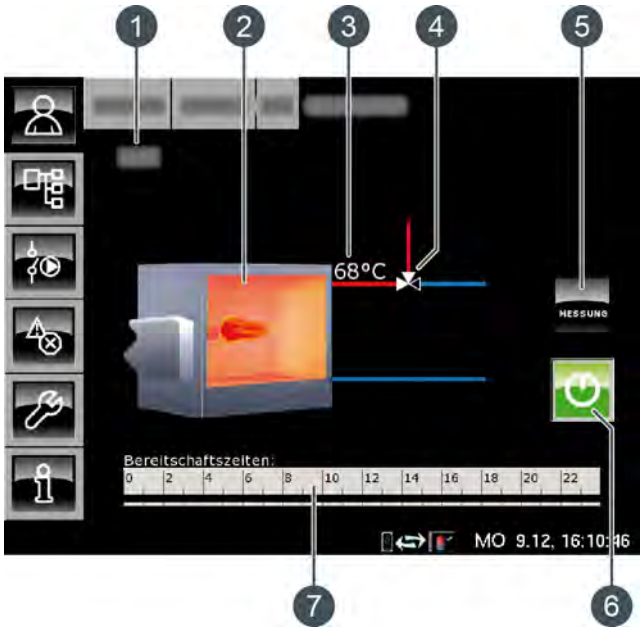
Enter the value and press the [Accept] button to save.

7.8 [Aux.boiler] function block

7.8.1 Overview

Auxiliary boiler overview

Press and [Aux.boiler] to open the auxiliary boiler overview window.



1 Operating mode
2 Auxiliary boiler
3 [AuxBoilerTemp] temperature
4 Diverter valve (only with [Diverter valve] option)
5 [MEAS.] button
6 [On/Off] button
7 [Stand-by times] timer

Various tasks of the auxiliary boiler

An additional auxiliary boiler in the heating system serves either to cover peak loads in the heating system, or as fail-safe for the main heat producer (for example: boiler or another buffer).

Auxiliary boiler to cover peak loads:

- This auxiliary boiler has a separate charging pump and can supply the consumer (e.g. buffer) with heat at the same time as the main heat producer (e.g. boiler).

  The auxiliary boiler is only activated by the control system if the ETA heating boiler is unable to meet the required output. For heating systems with a buffer, the aux. boiler is put into operation as soon as the ETA heating boiler has not reached the required temperature [Buffer target]. For heating systems without a buffer, if the ETA heating boiler has not reached the required temperature [Boiler tgt.].

  The icon for the auxiliary boiler pump is displayed in the overview as soon as it's in operation. This is started by the ETA control system if the aux. boiler temperature is higher than the enabling temperature of the charging pump [Enable Aux-BoilChargePump]. In addition, the auxiliary boiler temperature must be greater than the temperature of the consumer to be charged by at least the configured [Thermostat diff.] difference.

Aux. boiler as fail-safe for the main heat producer:

- Through the changeover valve between main heat producer and aux. boiler, the consumers are supplied either by the main heat producer or the aux. boiler. If the main heat producer is switched off or a malfunction is present, the changeover valve changes to the aux. boiler to meet the heat requirements of the consumer.

  A changeover valve is displayed in the overview screen with a red and blue line. The red line indicates the heat producer that is currently supplying heat to the consumers. The blue line indicates the heat producer that is disabled. Switching from one heat producer to another only happens when the temperature of the auxiliary boiler exceeds the configured enabling temperature [Enable diverter valve] of the changeover valve. Only then does the changeover valve route the heat from the hotter heat producer to the consumers.

Auxiliary boiler functionality

Use the [On/Off] button to enable or disable the auxiliary boiler for the ETA control system. If the auxiliary boiler is enabled (button lit up green), the ETA control system can activate it when needed, but only within the configured times of operation.

After a demand for the auxiliary boiler by the ETA control system, the start of the auxiliary boiler can be delayed with the adjustable [Start lag] parameter; see page 68.

The [Stand-by times] timer is used to set the charging times for the auxiliary boiler; see page 68.

The [MEAS.] button switches the auxiliary boiler to emission measuring mode.

[MEAS.] button

This button operates the auxiliary boiler for a period of 30 minutes for the emission measurement. When the 30 minutes are over, the auxiliary boiler automatically switches back to normal operation.

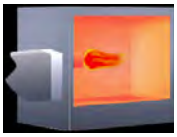
[On/Off] button

This button enables and disables the auxiliary boiler. If the auxiliary boiler is enabled, this button appears green  .

Timer [Stand-by times]

This timer shows the configured time slots for auxiliary boiler stand-by for the current day of the week. These time windows are displayed as a black bar in the timer.

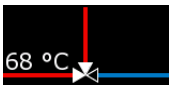
Auxiliary boiler



The flame in the auxiliary boiler is displayed when it is enabled in the ETA control system.

Changeover valve

Optional: only for [Diverter valve]



The red line indicates which heat producer (auxiliary boiler or ETA boiler) is currently supplying heat to the consumers. The blue line indicates the heat producer that is disabled and is not currently supplying any heat.

Auxiliary boiler charging pump

Optional: only for [Aux.boiler charging pump]

This symbol is displayed when the auxiliary boiler charging pump is in operation.

7.8.2 Operating modes

Off

The auxiliary boiler has been disabled with the  button (switched off), so it cannot be put into operation by the ETA control system.

Ready

The auxiliary boiler is enabled and within the configured stand-by times.

On

The auxiliary boiler is in operation and is supplying heat to the heating system.

Measurement

The auxiliary boiler is in emission measuring mode for the duration of 30 minutes.

Malfunction

There is a fault in a temperature sensor.

Wait delay

A delay was set for operation of the auxiliary boiler. The auxiliary boiler waits for the configured duration of the delay ([Start lag] parameter). If there is still a demand by the ETA control system after this period ends, then the auxiliary boiler will begin operation.

Locked

The ETA control system has disabled the auxiliary boiler so that it cannot be in operation simultaneously with the boiler.

Timer off

The current time is outside the configured stand-by times.

Overtemperature

The auxiliary boiler's temperature has exceeded the configured [AuxBoilerMax] temperature and the auxiliary boiler will therefore be switched off.

7.8.3 Operation

Setting auxiliary boiler stand-by times

The [Stand-by times] timer can be used to set 3 different time windows for auxiliary boiler stand-by for each day of the week.

To set the stand-by times, tap the [Stand-by times]  timer in the overview window. A screen opens.

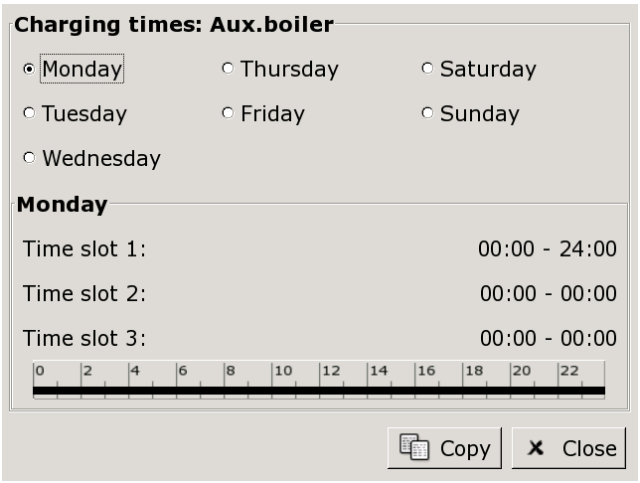


Fig. 7-32: Overview of stand-by times

You can find further details about setting the time window in chapter 7.1.5 "Setting a time window".

7.8.4 Text menu

7.8.4.36 Start lag

Explanation of [Start lag]

This parameter is used to set the duration of a delay in the operation of the auxiliary boiler after the ETA control system has demanded it.

If there is still a demand by the ETA control system after this period ends, then the auxiliary boiler will begin operation.

Modifying parameters

The parameter can be found under:

Aux.boiler
Settings
Start lag

Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

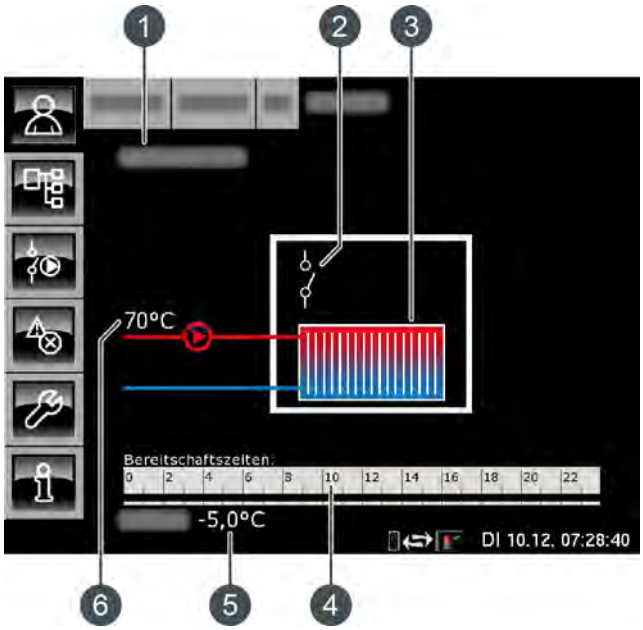
7.9 [External heat demand] function block

7.9.1 Overview

External heat demand overview

Press the button and [ExtDem] to open the external heat demand overview.

With this function block, an external control system can demand heat from the ETA heating system.



1 Operating mode
2 Switch
3 External heat consumer
4 [Stand-by times] timer
5 Outside temperature
6 Temperature of ETA heating system

External heat demand function

With the [Stand-by times] timer, for each day of the week different time slots and the temperature needed by the external heat consumer can be configured.

Within the time slots, the external heat consumer can demand heat from the buffer. If the buffer is colder than the temperature demanded by the heat consumer, the ETA boiler is activated.

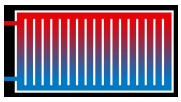
The pump for charging the external heat consumer only starts when the temperature available from the heating system is higher than the adjustable enable temperature [Enable temperature]; see page 72.

If the external heat consumer is connected to the [GM-C2] circuit board, the output or temperature required by the heat consumer can be communicated to the ETA control system via an analogue signal (0-10 V or 4-20 mA).

Timer [Stand-by times]

This timer shows the configured time slots for external heat consumer stand-by for the current day of the week. These time windows are displayed as a black bar in the timer.

External heat consumer



This symbol represents the external heat consumer. If the top section is shown in red, the consumer is currently being supplied with heat.

If the consumer is entirely blue, no heat is being supplied to it.

Switch

This symbol indicates whether the heat consumer is currently demanding heat from the heating system.

If the switch is open there is currently no demand by the heat consumer. If the switch is closed the external consumer is demanding heat from the heating system.

External charging pump

This symbol appears when the external heat consumer's charging pump is in operation. The displayed temperature is the buffer's [Buffer top] temperature.

7.9.2 Operating modes

Off

There is no demand from the external heat consumer.

Demand

The external heat consumer is demanding heat from the heating system.

Delay

The external heat consumer is switched off and the pump is running for the configured duration [Delay time].

Heat dissipation

The external heat consumer is being charged to dissipate the excess heat from the boiler.

FreezeProt

The current outside temperature is lower than the configured [FreezeProt] temperature of the external heat consumer.

To protect the consumer, the external charging pump is switched on. It will remain in operation until the outside temperature is at least 2 °C higher than the [FreezeProt] temperature setting.

The factory setting for the freeze protection threshold is +5 °C outside temperature to protect consumers at risk from freezing (such as air heat exchangers).
If there is no freezing risk for the connected consumers, the freeze protection limit can be set lower.

Timer off

There is a demand by the external heat consumer, but the current time is outside the time slot configured in the timer so the external heat consumer will not be charged.

Working

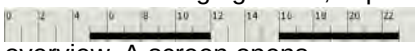
The external heat consumer is being supplied with heat by the heating system.

7.9.3 Operation

Set charging times and temperatures for the external heat consumer

With the [Stand-by times] timer, you can set different time windows and temperatures for the external heat consumer for each day of the week.

Within these time windows, the heat consumer can demand heat from the heating system.

To set the charging times, tap the [Stand-by times]  timer in the overview. A screen opens.

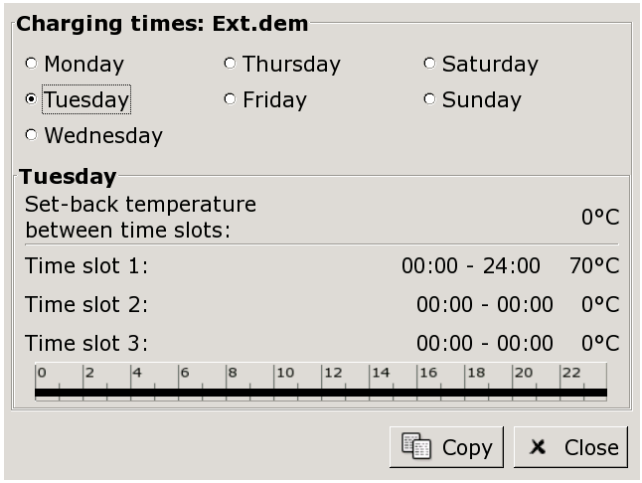


Fig. 7-33: Overview of stand-by times

You can find further details about setting the time window in chapter 7.1.5 "Setting a time window".

7.9.4 Text menu

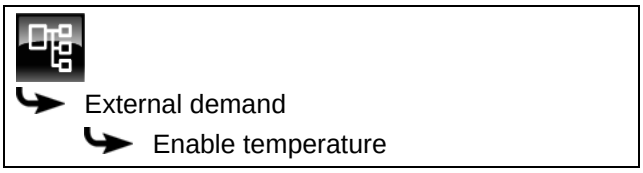
7.9.4.37 Enable temperature

Explanation of [Enable temperature]

This parameter is used to set the minimum temperature of the heating system for starting the charging pump of the external heat consumer.

Modifying parameters

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.9.4.38 FreezeProt

Explanation of [FreezeProt]

This parameter is used to set the freeze protection limit for the consumer controlled with the external heat demand.

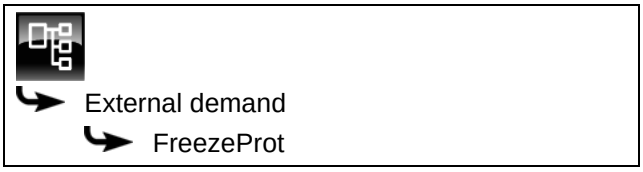
If the outside temperature falls below this value, the external charging pump will be turned on to protect the consumer. It will remain in operation until the outside temperature is at least 2 °C higher than the [Freeze-Prot] temperature setting.

The factory setting for the freeze protection threshold is +5 °C outside temperature to protect consumers at risk from freezing (such as air heat exchangers).
If there is no freezing risk for the connected consumers, the freeze protection limit can be set lower.

Modifying parameters

The [Service] access level is required to perform modifications.

The parameter can be found under:



Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

7.10 [Heating pipeline] function block

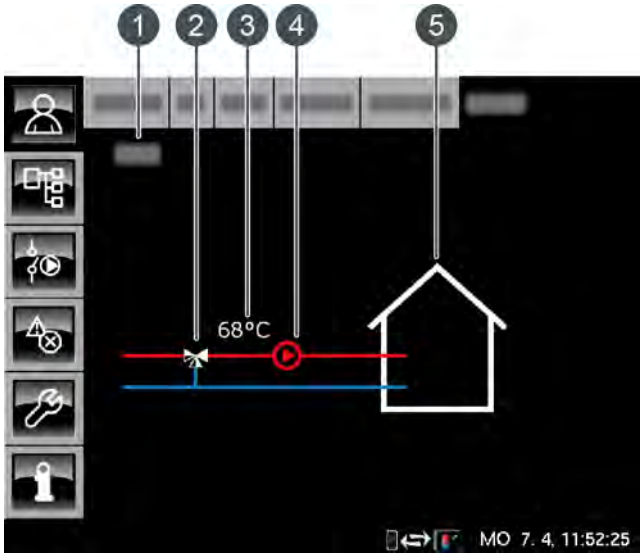
7.10.1 Overview

Overview of heating pipeline

Press the button and [Pipel] to open the heating pipeline overview.

A heating pipeline is defined as a connection between a heat producer and a consumer with an additional pump and optional mixing valve.
Example: Boiler and consumer are in different and widely separated buildings.

With this function block, a heating substation can also be used for withdrawing heat in a district heating network; see page 74.



1 Operating mode
2 Heating pipeline mixing valve (only with [Pipeline mixing valve] option)
3 Current flow temperature (only with the [Pipeline mixing valve] option)
4 Heating pipeline pump
5 Heating pipeline consumers

How the heating pipeline works

The heat is supplied to the connected consumers (buffer, heating circuits, hot water tank, etc.) via the heating pipeline with the heating pipeline pump.

When the heating pipeline is in operation, the upper line (=flow) is shown in red and the symbol for the heating pipeline is displayed.
If the heating pipeline is not in operation, both lines are shown in blue.

If a mixing valve is installed in the heating pipeline, it is shown in the overview with the currently measured flow temperature. With the heating pipeline mixing valve, only the required temperature is supplied to the consumers, making the heating pipeline's heat loss considerably lower and improving the stratification in the buffer.

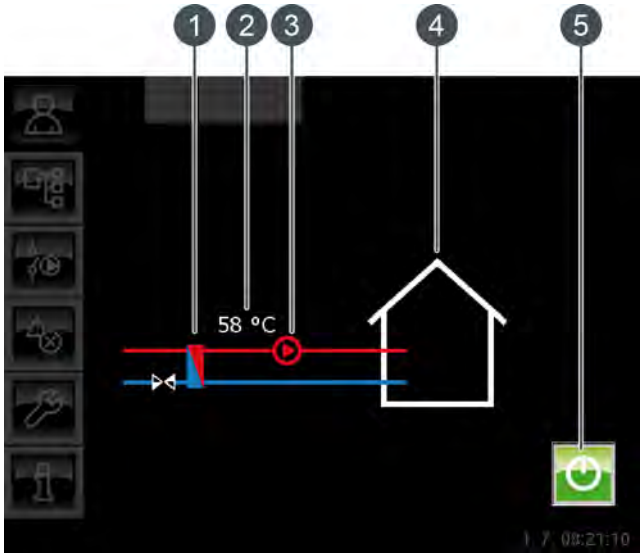
Overview of heating substation

With the [Transfer station] option this function block is used to control a heating substation in a district heating network.

A heating substation is defined as a plate heat exchanger with a primary valve.

This function block is then the heat producer for the connected consumers such as heating circuits, buffers, hot water tanks, etc.

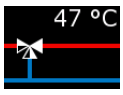
When head is supplied to consumers from the heating substation, the upper line (=flow) is shown in red. The symbol for the heating pipeline pump and the current flow temperature are displayed.
If the heating substation is not in operation, both lines are shown in blue.



1 Heating substation's heat exchanger
2 Current flow temperature [Curr. temp.]
3 Heating pipeline pump
4 Heating substation's consumer
5 [On/Off] button to switch heating substation on/off

Heating pipeline mixing valve

Optional: only for [Pipeline mixing valve]



When the heating pipeline is in operation, the upper line is shown in red and the currently measured flow temperature is displayed. When it is not in operation, only the mixing valve symbol is displayed and both lines are shown in blue.

Heating pipeline pump

This symbol appears when the external heating pipeline pump is in operation.

Heating pipeline consumers

This symbol represents the heating pipeline's connected consumers.

7.10.2Operating modes

Off

There is no demand from the consumers.

On

Heat is being supplied to the connected consumers.

FreezeProt

The current outside temperature is lower than the configured temperature [FreezeProt] of the heating pipeline.

To protect the consumers, the transmission pump is switched on. It will remain in operation until the outside temperature is at least 2 °C higher than the [Freeze-Prot] temperature setting.

The factory setting for the frost protection limit is -20 °C.

Heat dissipation

The heating pipeline pump is started in order to dissipate the boiler's excess heat by charging the heating pipeline's consumers.

Malfunction

There is a fault in a temperature sensor.

7.11 [Pellet store] function block

7.11.1 Overview

Pellet store overview screen

Press the button and [Store] to open the pellet store overview screen.

This function block is used to control pellet transport with a discharge screw or a single suction head.

When the pellet store has been filled, you can enter the new stock of pellets by pressing the [Changing the pellet store] button.

1 Operating mode
2 Current pellet stock
3 [Changing the pellet store] button

[Changing the pellet store] button

With this button, you can enter the new stock of pellets after a delivery.

7.11.2 Operating modes

Power supply error

There is a fault in the power supply to the discharge screw.

Self-check

The conveyor drive is performing a self-check.

Ready

The conveyor is not in operation, and there is no demand for fuel.

Off

There is no demand from the boiler.

Start vacuum motor

The boiler is demanding pellets and the suction motor is starting up.

Vacuum motor running

The boiler suction motor is in operation.

Convey

The boiler suction motor and the discharge screw in the pellet store are in operation.

Empty hoses

The discharge screw in the pellet store is switched off but the boiler suction motor continues to run, in order to empty the hoses.

Suction time exceeded

The suction motor has exceeded the maximum fill-up time. Inside this period, not enough pellets were conveyed to the boiler.

Delay due to error

There is a problem with the discharge screw in the pellet store. The boiler suction motor continues to run briefly.

Discharge screw error

There is a fault in the discharge screw in the pellet store, due to overcurrent, heating or insufficient current consumption.

Self-check error

The discharge screw self-check has failed.

7.11.3 Operation

Entering the pellet stock

The control system calculates the pellet consumption on the basis of the boiler stoker parameters, and deducts this from the entered stock value. Actual pellet consumption is not measured, therefore the displayed value may differ from the actual pellet stock by +/- 15%.

Press the button in the overview screen.

A screen opens:

Enter the new value and press [Accept] to save.

Entering a minimum level for the pellet stock

You can define a minimum level for the pellet stock so that a warning is issued when the stock goes below that level.

The minimum level is set with the [Warning limit for pellet stock] parameter in the text menu of the pellet stock.

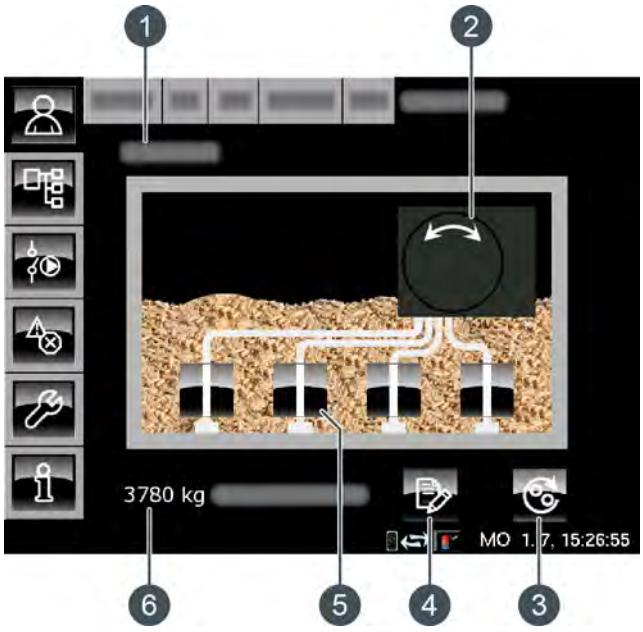
7.12 [Pellet store with switch unit] function block

7.12.1 Overview

Overview screen of pellet store with switch unit

Press the button and [SwitchUnit] to open the pellet store overview screen.

Up to 4 suction heads can be controlled by one switch unit. Here, only control of 4 suction heads is dealt with.



1 Operating mode
2 Switch unit
3 [Switching suction heads] button
4 [Changing the pellet store] button
5 Suction heads
6 Current pellet stock

How the switch unit works

The conveying and clear modes are represented by a green line between an enabled suction head and the switch unit.

If a suction head is no longer able to convey pellets, the control system automatically switches to clear mode. Here, the conveying hose now introduces back air, in order to dislodge any blockages in the conveying hose or suction head.

The switch unit regularly switches between the individual, enabled suction heads, to ensure that the pellet store is emptied uniformly. You can set the maximum number of fill-up operations by a suction head, see page 80.

When the pellet store has been filled, you can enter the new stock of pellets by pressing the [Changing the pellet store] button.

Switch unit positions

The following symbols are displayed, depending on the current position of the switch unit:


Switch unit is changing the suction head


Conveying mode for suction head 1


Clear mode for suction head 1


Conveying mode for suction head 2


Clear mode for suction head 2


Conveying mode for suction head 3


Clear mode for suction head 3


Conveying mode for suction head 4


Clear mode for suction head 4

[Changing the pellet store] button


With this button, you can enter the new stock of pellets after a delivery.

[Switching suction heads] button


If you press this button, the switch unit changes to the next enabled suction head.

[Changing the pellet store] button


With this button, you can enter the new stock of pellets after a delivery.

Enabling and disabling a suction head


If you press this button, the selected suction head is enabled or disabled. If the suction head is enabled, the symbol appears and pellets can be conveyed from this suction head. If it is disabled, is displayed and the switch unit does not switch to this suction head.

7.12.2 Operating modes

Off

There is no demand from the boiler.

Ready

The switch unit has reached the position for conveying mode.

Change position

The switch unit is changing its position to another enabled suction head.

Convey

The switch unit is conveying pellets from an enabled suction head to the boiler.

RevFeed

The switch unit has switched to clear mode. Here, the conveying hose now introduces back air, in order to dislodge any blockages in the conveying hose or suction head.

Error fill time

The pellet bin on the boiler could not be filled inside the maximum fill-up time.

Empty

The pellet bin on the boiler could not be filled inside the maximum fill-up time after clearing of all suction heads and subsequent conveying.

Reference

The switch unit is changing the position to the reference point.

Stop

Conveying mode has stopped.

Locked

All suction heads have been disabled. Therefore, conveying mode is not possible.

Vacuum motor delay

Suction stopped due to a malfunction, and the boiler suction motor continues to run briefly.

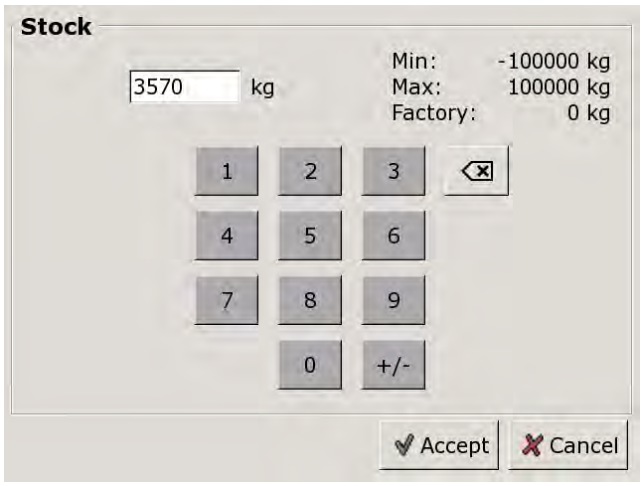
7.12.3 Operation

Entering the pellet stock

The control system calculates the pellet consumption on the basis of the boiler stoker parameters, and deducts this from the entered stock value. Actual pellet consumption is not measured, therefore the displayed value may differ from the actual pellet stock by +/- 15%.

Press the button in the overview screen.

A screen opens:



Enter the new value and press [Accept] to save.

Entering a minimum level for the pellet stock

You can define a minimum level for the pellet stock so that a warning is issued when the stock goes below that level.

The minimum level is set with the [Warning limit for pellet stock] parameter in the text menu of the pellet stock.

7.12.4 Text menu

7.12.4.39 Switching at

Explanation of [Switching at]

This parameter sets the maximum number of suction operations of an enabled suction head. When a suction head has reached this number, the switch unit automatically changes to the next enabled suction head.

Modifying parameters

The parameter can be found under:

Conveying system

Switching at

Select the parameter and press the [Change] button. A settings window will open.

Enter the value and press the [Accept] button to save.

8 Rectifying problems

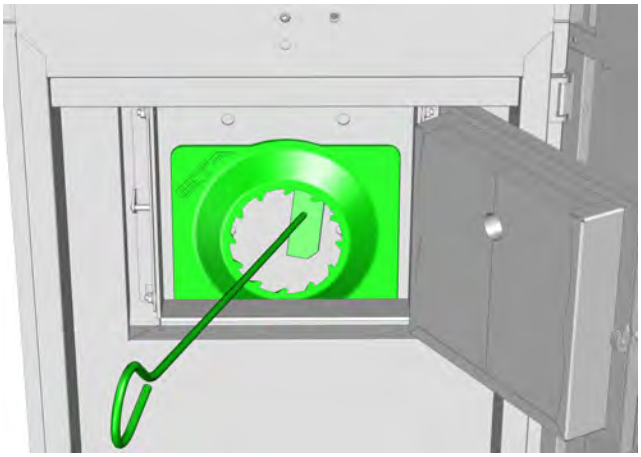
Tilting grate stuck

If the tilting grate is stuck, a corresponding warning will be displayed on the screen to indicate that the grate cannot reach its position.

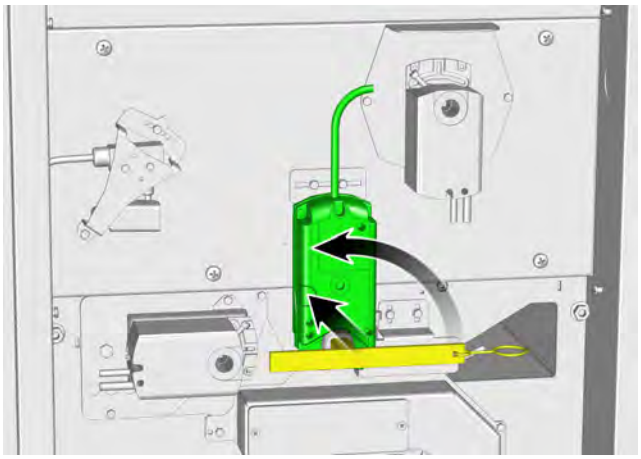
The most common reason is a full ash box and thus too much ash in the combustion chamber, which keeps the grate from tipping. So first check to see how full the ash box is and empty it.
If the ash box is not full, then it can be assumed that a foreign object is blocking the tilting grate.
In either case, perform the following steps.

Stop heating by pressing [On/Off] in the boiler overview window. As soon as the [Switched off] status is displayed, switch off the boiler with the mains switch.

Open the combustion chamber door and use the poker to lift the combustion chamber cover and lean it against the combustion chamber wall.

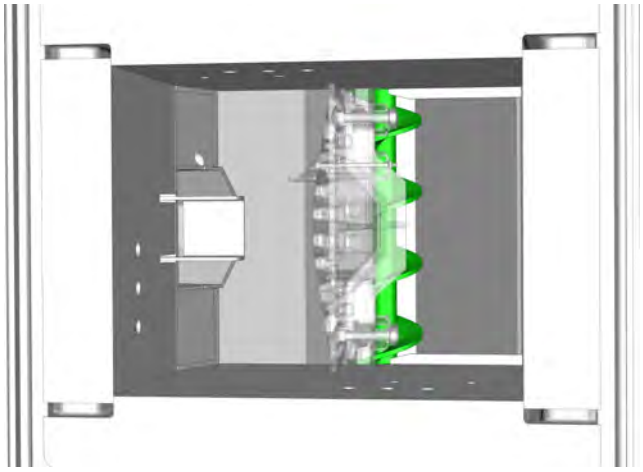


Remove the cover on the front. Press the button on the tilting grate's actuator and tilt the grate with the supplied tool.



Now the combustion chamber and ash screw are visible; check them for foreign objects and remove any that are present.

If no foreign objects are visible, the reason for the blockage is too much ash under the tilting grate. Use the poker to move the ash to the ash screw.



Replace the combustion chamber cover and the cover on the front.

Switch on the boiler with the mains switch.

To check, start de-ashing by pressing [ASH].

If there is still a blockage, the ash screw must be removed.

Removing the ash screw

If the ash screw is jammed or the foreign body cannot be removed, the ash screw must be removed.

Stop heating by pressing [On/Off] in the boiler overview window. As soon as the [Switched off] status is displayed, switch off the boiler with the mains switch.

Detach the ash box from the boiler and remove the M8 screw that secures the ash screw.

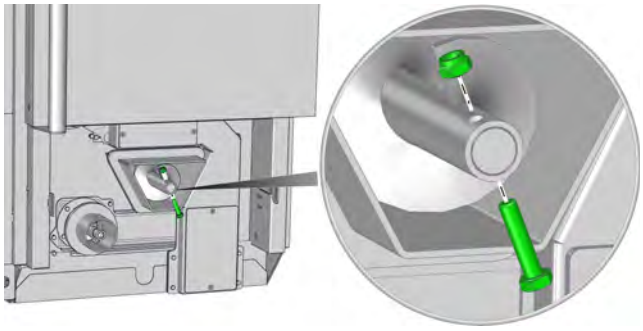


Fig. 8-1: Removing the screw

The ash screw is now loosened from its shaft and can be extracted from the ash duct by turning it anti-clockwise.

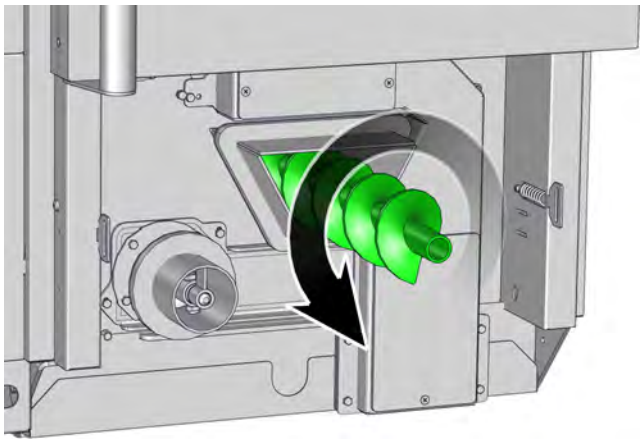


Fig. 8-2: Unscrewing the ash screw

Remove the ash or the foreign body from the ash duct.

Then insert the ash screw again and secure it with the M8 screw.

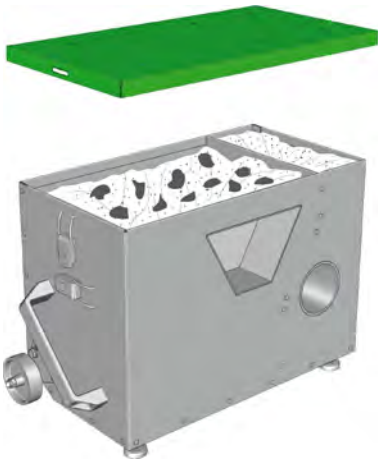
Replace the ash box and switch on the boiler with the mains switch.

To check, start de-ashing by pressing [ASH]  .

9 Information on fuel

When the fuel causes slag

If large pieces of slag are found in the ash box, the cause usually lies in the fuel's ash content. Therefore, the boiler must be de-ashed more often.



Shorten the de-ashing interval by 50% if slag occurs. The boiler then performs twice as many de-ashing runs. To adjust, page 27.

Leak air from a poorly sealed combustion chamber door, heat exchanger cover, ash box, maintenance cover... causes slag. Ensure that they are closed and their seals are in order.

An excessive flue draught can also cause slag by reducing the effectiveness of the flue gas recirculation. If the flue draught is over 15 Pa, a draught limiter is required. Or a nozzle on the chimney opening, with which higher exit velocities and better lift for the flue gas are achieved.

Keep an eye on the quality

The composition and characteristics of pellets are standardised, but not legally regulated. To heat with minimum possible maintenance, demand certified quality in accordance with the applicable current standards from your pellet dealer.

Delivery quality also includes the last link in the transport chain, blowing the pellets into the storeroom. The pellets should not fly too fast or too slowly; they should strike the impact protection mat gently and not be pulverised.

A reference value for an acceptable injection time is 4 to 5 minutes per ton. In no case should the pellets be injected more quickly.

Solid and with little dust

The pellets must be solid enough that they do not disintegrate to dust during transport, injection into the store or suction from the store to the boiler. High dust content hinders combustion and results in more ash in the flue gas.

The inclusion of small amounts of natural bonding agents, such as maize starch or molasses, improves the transportability of the pellets and keeps their dust content to a minimum.

10 Low-emission operation

Notes on complying with limit values in Germany after 1 January 2015

In accordance with the provisions of "BImSchV," lower limit values for the emission measurement in Germany apply to all new heating system installations starting 1 January 2015. In particular, compliance with the new dust limit value of 20 mg/m³ can lead to problems in practice.

It was determined under laboratory conditions in testing centres that the ETA boiler complies with the new limit values. To be fair, however, it should be noted that high-quality fuels were used and the heating system operated under optimal conditions. Things look different in practice. Low-quality fuels are often used, which represents a problem for the dust limit value.

Fuels used for testing

The following fuels were used as test fuel for emission measurements and approval of the boiler:

- Pellets according to ISO 17225-2 with the designation "D06 M10 A0.5"

The ash content of the fuel is an indicator for the dust emission

According to the current state of science, dust emissions from complete combustion are inorganic components in the fuel, so-called aerosol formers. Studies by renowned research institutes have clearly demonstrated that the aerosol formers present in the fuel (e.g., potassium, calcium, sulphur, chlorine, sodium, zinc, silicon, phosphorous...) are released in relatively fixed proportions. Accordingly, the level of dust emissions is determined by the proportions of these aerosol formers in the fuel.

The situation is made difficult by the fact that the percentage of aerosol formers in the wood depends on many factors (tree species, soil condition, season…). Even different parts of the tree (trunk, branches, core/sapwood) can demonstrate stark fluctuations.

In practice, the ash content of the fuel has proven to be a good indicator of the percentage of aerosol formers. In order to operate the system with the lowest possible dust emissions, a properly maintained condition as well as high-quality fuels with the lowest possible ash content (barks, impurities, leaves, needles...) are indispensable.

Dear customer!

Your boiler is labelled with the "Blauen Engel" to show that it is an environmentally friendly boiler. With this in mind, please note the following for efficient and low-emission operation of your heating system:

1) The installation and adjustment of the heating system must be performed only by qualified and trained personnel.
2) Use only the fuels specified by us in the user manual (in the warranty conditions). This is the only way to ensure low-emission, economical and problem-free operation of your heating system.
3) Perform the maintenance and cleaning procedures recommended by us on your heating system at regular intervals. In this way, you can ensure that your heating system and its safety features will work effectively to provide efficient and low-emission operation. You can get the best care for your heating system by signing a service contract.
4) Your boiler is adjustable within an output range between 30% and 100% of its rated output. To avoid unnecessary emissions in low-output operation, the systems should be operated as much as possible in the mid to high-output range (adjusted to the heating requirement). Please do not use any heating controller that is separate from the boiler control. Use the heating circuit control integrated in the boiler control in combination with a room sensor.
5) From an energy perspective, a buffer storage tank and a combination with a solar heating system are recommended. This ensures efficient and low-emission operation of your heating system.

The Clean Air Act 1993 and Smoke Control Areas

Under the Clean Air Act local authorities may declare the whole or part of the district of the authority to be a smoke control area. It is an offence to emit smoke from a chimney of a building, from a furnace or from any fixed boiler if located in a designated smoke control area. It is also an offence to acquire an "unauthorised fuel" for use within a smoke control area unless it is used in an "exempt" appliance ("exempted" from the controls which generally apply in the smoke control area).

The Secretary of State for Environment, Food and Rural Affairs has powers under the Act to authorise smokeless fuels or exempt appliances for use in smoke control areas in England. In Scotland and Wales this power rests with Ministers in the devolved

administrations for those countries. Separate legislation, the Clean Air (Northern Ireland) Order 1981, applies in Northern Ireland. Therefore it is a requirement that fuels burnt or obtained for use in smoke control areas have been "authorised" in Regulations and that appliances used to burn solid fuel in those areas (other than "authorised" fuels) have been exempted by an Order made and signed by the Secretary of State or Minister in the devolved administrations.

The ETA PE-K 35, 45, 50, 70 and 90 kW boiler has been recommended as suitable for use in smoke control areas when burning wood pellets according to EN 14961-2 class A1, EN plus class A1 or DINplus with a diameter of 6 to 8 mm and a length of 15 to 40 mm.

Further information on the requirements of the Clean Air Act can be found here:
http://smokecontrol.defra.gov.uk/

Your local authority is responsible for implementing the Clean Air Act 1993 including designation and supervision of smoke control areas and you can contact them for details of Clean Air Act requirements.