Service handbook

Lambdatronic H 3200 - Turbomat

Core module version 55.04 - Build 05.21 | Touch contol version 60.01 Build 01.39

Translation of original German version of service handbook for technicians.

Read and follow all instructions and safety instructions.
All errors and omissions excepted.

B1840023_en | Edition 21/03/2024

1 General

1.1 About these instructions

Please read and follow the operating instructions, in particular the safety information contained therein. Keep them available next to the boiler.

These operating instructions include important information about operation, electrical connection and troubleshooting. The parameters shown depend on the set boiler type and the system configuration!

The constant further development of our products means that there may be minor differences from the pictures and content. If you discover any errors, please let us know: doku@froeling.com.

1.2 Safety information

⚠ DANGER

When working on electrical components:

Risk of electrocution!

When work is carried out on electrical components:

- ❒ Always have work carried out by a qualified electrician
- ❒ Observe the applicable standards and regulations
  - ↳ Work must not be carried out on electrical components by unauthorised persons

⚠ WARNING

When touching hot surfaces:

Severe burns are possible on hot surfaces and the flue gas pipe!

When work is carried out on the boiler:

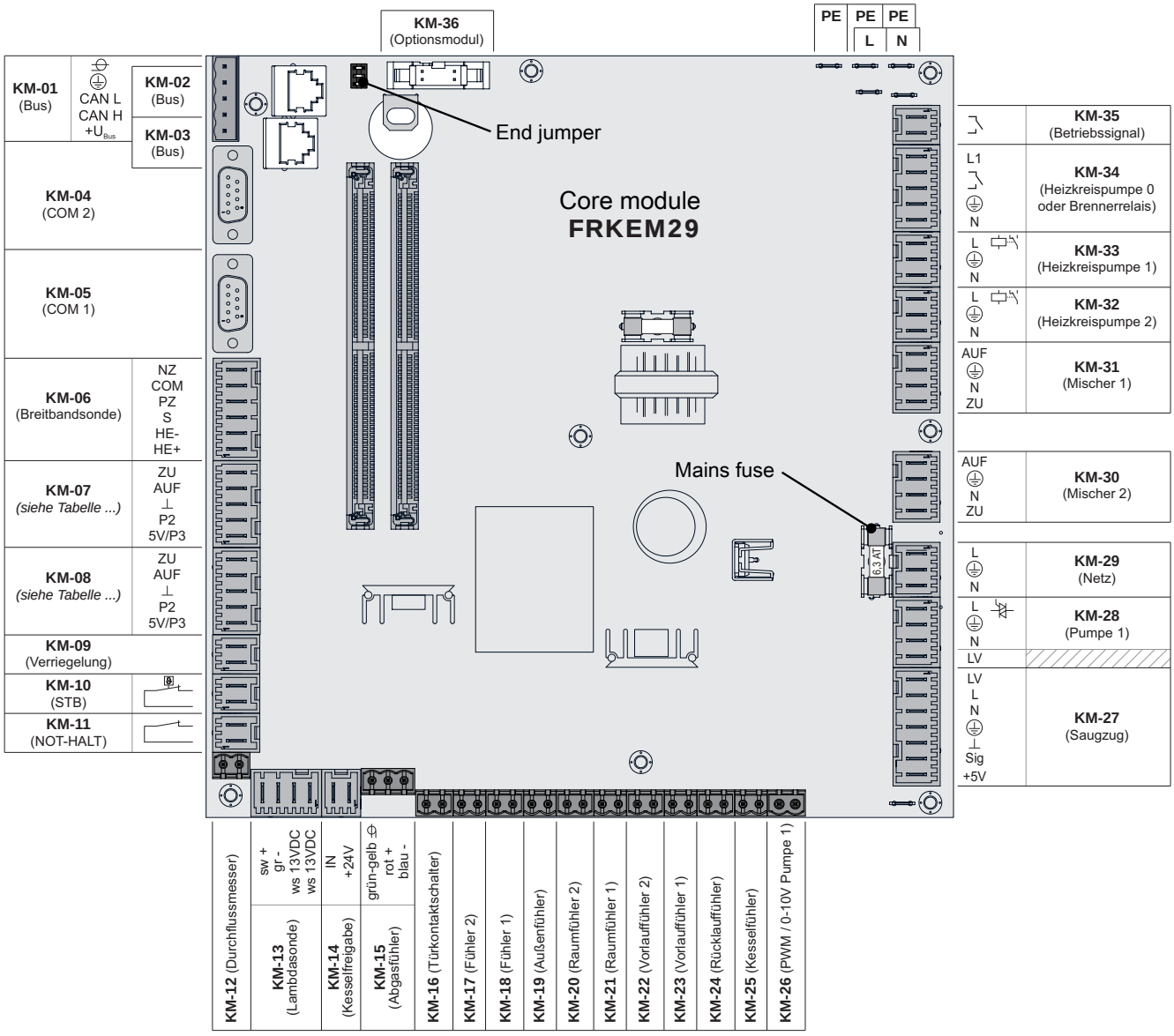
- ❒ Shut down the boiler according to procedure (“Off” operating status) and allow it to cool down
- ❒ Protective gloves must usually be worn for work on the boiler, and it should only be operated using the handles provided
- ❒ Insulate the flue gas pipes and do not touch them during operation

The information on safety, standards and guidelines in the assembly and operating instructions for the boiler should also be observed!

2 Power connection and wiring

2.1 Core module and connection options

2.1.1 Board view - core module



Connection / Name		Note
KM-01	BUS	Connection with cable – LIYCY paired 2x2x0.5; ➲ "Connecting the bus cable" [▶ 30] Caution! CAN L and CAN H must not be connected to $+U_{BUS}$!
KM-02 KM-03	BUS	Patch cable CAT 5 RJ45 SFTP 1:1 configuration; wood chip module connection
KM-04	COM 2	Null modem cable 9-pin SUB-D; Connection is used e.g. as MODBUS interface
KM-05	COM 1	Null modem cable 9-pin SUB-D; Service interface for software updates and connection to visualisation software

Connection / Name		Note
KM-06	Residual oxygen	Connecting cable[1] 7 x 0.75 mm² Connecting a Bosch residual oxygen probe
KM-07	Primary air	Connection cable[1] 5 x 0.75 mm²
KM-08	Secondary air	Connecting cable[1] 6 x 0.75 mm²;
KM-09	Lock	Connecting cable[1] 2 x 1.5 mm²
KM-10	High-limit thermostat	
KM-11	EMERGENCY STOP	Caution! Do not connect the emergency stop/shutdown switch to the boiler power supply line. The switch must be a N/C switch and it must be linked to the 24V safety chain of the STL at this terminal!
KM-12	Flowmeter	Connection cable[1] 2 x 0.75 mm²
KM-13	Lambda probe	Connection cable[1] 4 x 0.75 mm² Connection of a Bosch switching-type sensor (type LSM11) or NTK switching-type sensor (type OZA685, item number: 69400)
KM-14	Boiler enable	Connecting cable[1] 2 x 1.5 mm² Caution! The connection must be a floating connection! ➲ "Boiler enable contact" [▸ 9]
KM-15	Flue gas temperature sensor	Only use connection cable of the component
KM-16	Door switch	Connecting cable[1] 2 x 1.5 mm²
KM-18	Sensor 1	Connecting cable[1] 2 x 0.75 mm², combustion chamber ash screw temperature
KM-19	Outside temperature sensor	Connection cable[1] 2 x 0.75 mm², shielded from 25 m cable length
KM-20	Room temperature sensor heating circuit 2	
KM-21	Room temperature sensor heating circuit 1	
KM-22	Flow temperature sensor heating circuit 2	
KM-23	Flow temperature sensor heating circuit 1	
KM-24	Slide-on duct sensor	Connection cable[1] 2 x 0.75 mm²
KM-25	Boiler sensor	
KM-26	PWM / 0-10V pump 1	
KM-27	Induced draught fan	Connecting cable[1] 3 x 1.5 mm² for FGR fan speed, Connecting cable[1] 3 x 0.75 mm² for power supply to the FGR fan
KM-28	Pump 1	Connection cable[1] 3 x 1.5 mm², max. 1.5A / 280W / 230V
KM-29	Mains connection	Connection cable[1] 3 x 1.5 mm², fuse provided by customer: C16A
KM-30	Mixing valve heating circuit 2	Connection cable[1] 4 x 0.75 mm², max. 0.15A / 230V
KM-31	Mixing valve heating circuit 1	
KM-32	Heating circuit pump 2	Connection cable[1] 3 x 1.5 mm², max. 2.5A
KM-33	Heating circuit pump 1	
KM-34	Heating circuit pump 0 or burner relay	Connection cable[1] 3 x 1.5 mm², max. 2A
KM-35	Operating signal	Connecting cable[1] 2 x 1.75 mm² ➲ "Operating signal" [▸ 14]

1. YMM to ÖVE-K41-5 or H05VV-F to DIN VDE 0881-5

Fuses

F2	6.3 AT	KM-27, KM-28

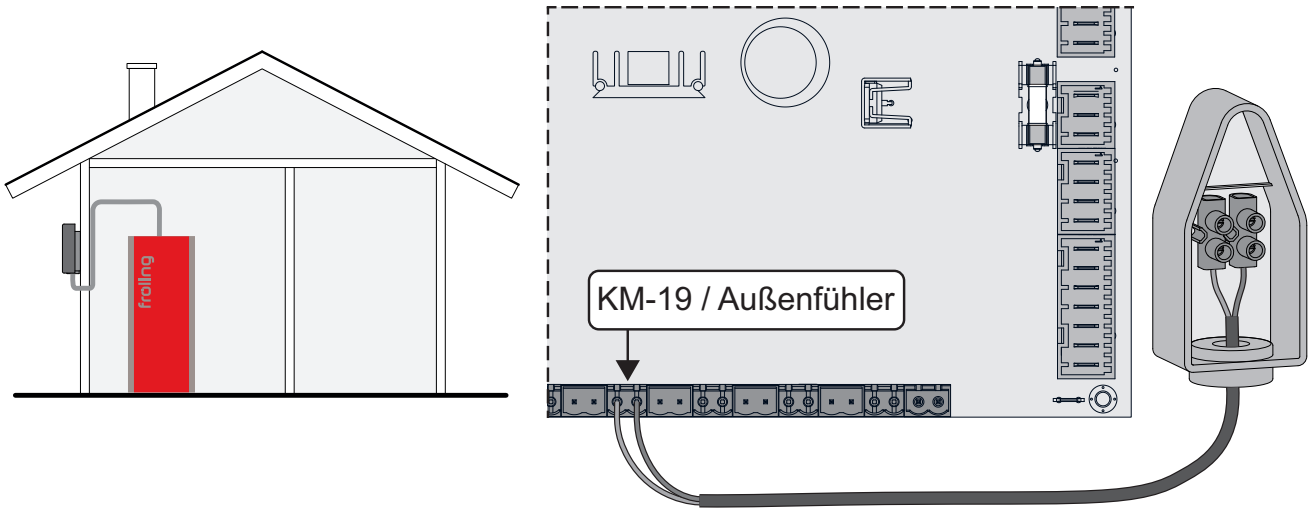
2.1.2 Mains connection

Plug the “Mains connection” plug into the power supply socket.

NOTICE! Flexible sheathed cable must be used for the wiring; this must be of the correct size to comply with applicable regional standards and regulations

2.1.3 Connecting the outside temperature sensor

The outside temperature sensor is included with the materials supplied for the boiler and is usually mounted on an outer wall that is not directly exposed to the sun. It continuously measures the ambient temperature and forms part of the weather-compensated heating circuit control.



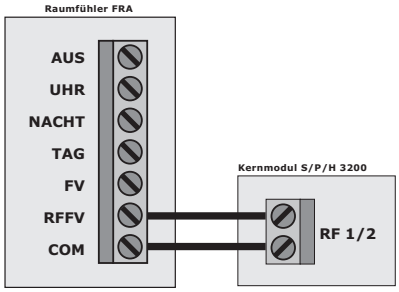
In the delivered state, the outside temperature sensor is read in by the core module ("KM-19 / outside temperature sensor" connection). Alternatively, the outside temperature sensor can be connected to an additional heating circuit module.

➲ "Heating circuit module" [▸ 15]

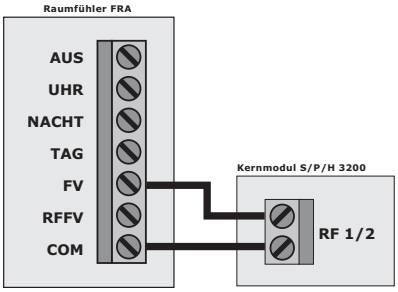
2.1.4 FRA room temperature sensor

In addition to recording the current room temperature, the Froling FRA room temperature sensor also has a handwheel to adjust the required room temperature and a slide switch to set the mode for the heating circuit.

affecting room:



not affecting room:



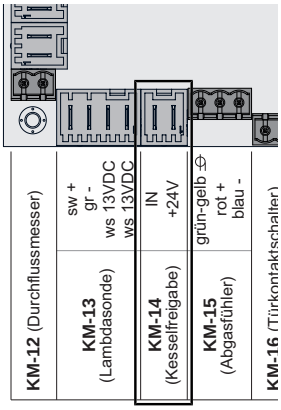
Possible positions of the mode switch:

⏻	**Boiler off**	Heating circuit deactivated, only frost protection!
🕒	**Automatic mode**	Heating and setback phases according to the set times
☾	**Setback mode**	Ignores the heating phases and continuously controls the room temperature to the temperature set in setback mode
☀	**Party switch**	Ignores the setback phases and continuously controls the room temperature to the temperature set in heating mode
Handwheel…	Allows you to adjust the temperature by +/- 3°C	

IMPORTANT! Refer to the supplied assembly instructions for more detailed explanations on connecting and operating the FRA room temperature sensor.

2.1.5 Boiler enable contact

When commissioning the boiler using the settings wizard, the boiler release contact function ("`How is the boiler release contact on the core module being used?`") is called up to enable the optional analysis of an external floating release or start contact. The following functions are possible depending on the setting and electrical connection:

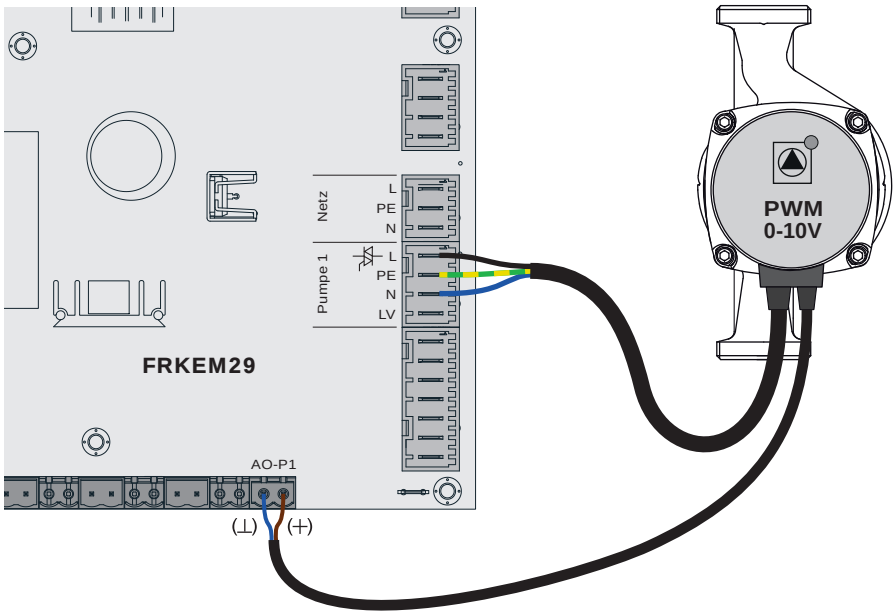
Connection position	Setting	Description
	not in use	No effect on boiler operation (contact must not be clamped/ bridged).
	Release/disable boiler	As long as the boiler release contact is closed, the boiler controller operates according to the specified parameters (mode, time window, etc.). If the boiler release contact is opened, the boiler is no longer released and follows the shutdown procedure. As long as the boiler release contact is open, heating requirements are ignored. (e.g. flue gas thermostat of a supply boiler, house distribution box).
	Extra heating	As long as the boiler release contact is open, the boiler controller operates according to the specified parameters. If the boiler release contact is closed, the boiler starts in continuous load operation (e.g. heat requirements of a heating fan).

2.1.6 Connecting a circulating pump to the core module

Different types of wiring must be implemented depending on the type of pump:

High efficiency pump with control line (PWM / 0-10V)

On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PWM or 0-10V signal.



❒ Connect the power supply for the high efficiency pump to output “Pump 1” of the core module

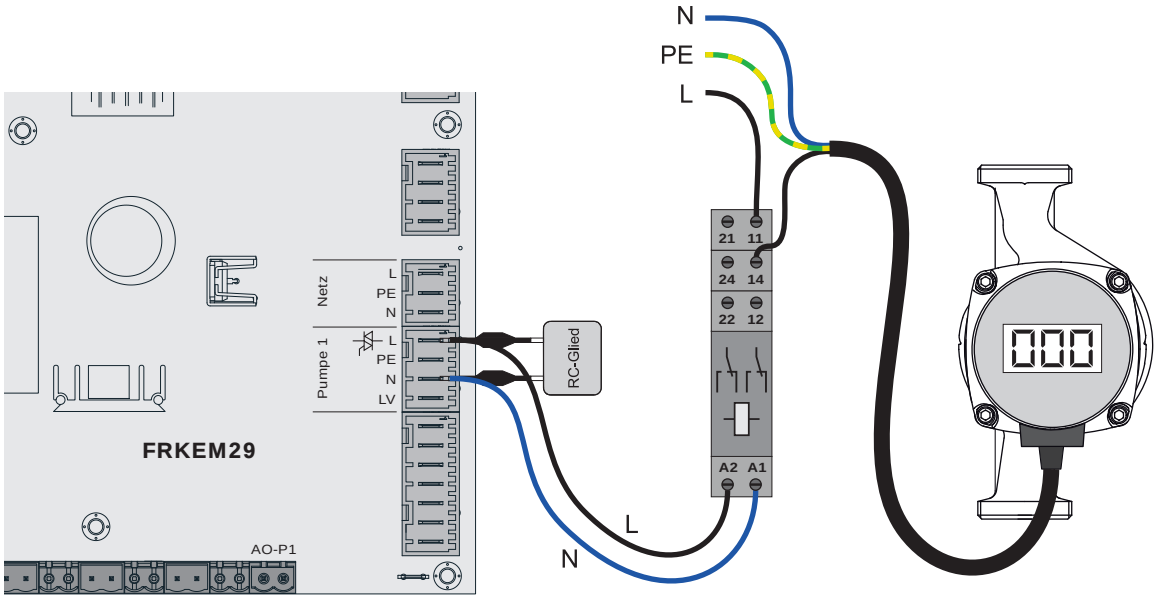
❒ Connect the PWM cable of the high efficiency pump to the corresponding “PWM / 0-10V” port

  ↳ Make sure that the cables are configured correctly (polarity) in accordance with the connection diagram of the pump!

❒ Set control of the pump in the relevant menu to “Field pump / PWM” or “Field pump / 0-10V”

High efficiency pump without control signal

It is not possible to control the speed when using this type of pump. The use of a line regulating valve (e.g.: Setter balancing valve) is recommended.

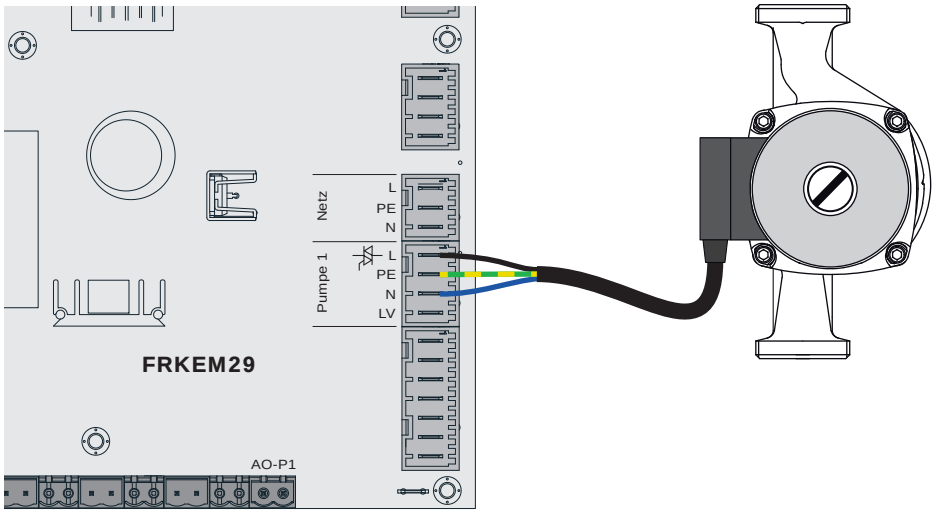


❒ Connect pump with relay and RC element isolated from the output

❒ In the relevant menu, set the pump control to “HE pump without control signal”

AC pump without control signal (pulse package control)

On older pumps without a control signal that are not highly efficient, the speed control is implemented via a pulse package control. Please note that the minimum speed may need to be adjusted on some pumps (default setting: 30%).



❒ Connect pump to output “Pump 1” of the core module

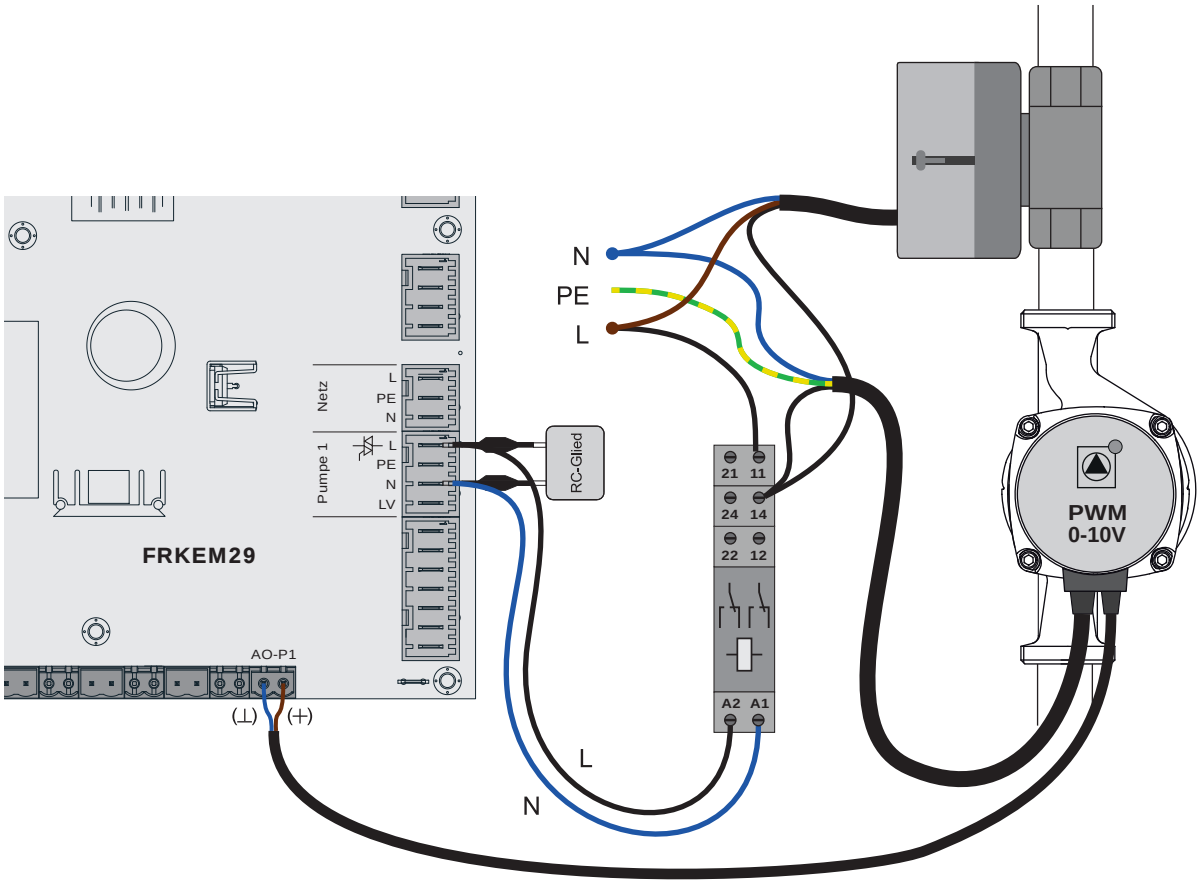
❒ In the relevant menu, set the pump control to “Pump without control signal”

2.1.7 Connecting a circulating pump with valve to the core module

Different types of wiring must be implemented depending on the type of pump:

High efficiency pump with control line (PWM / 0-10V)

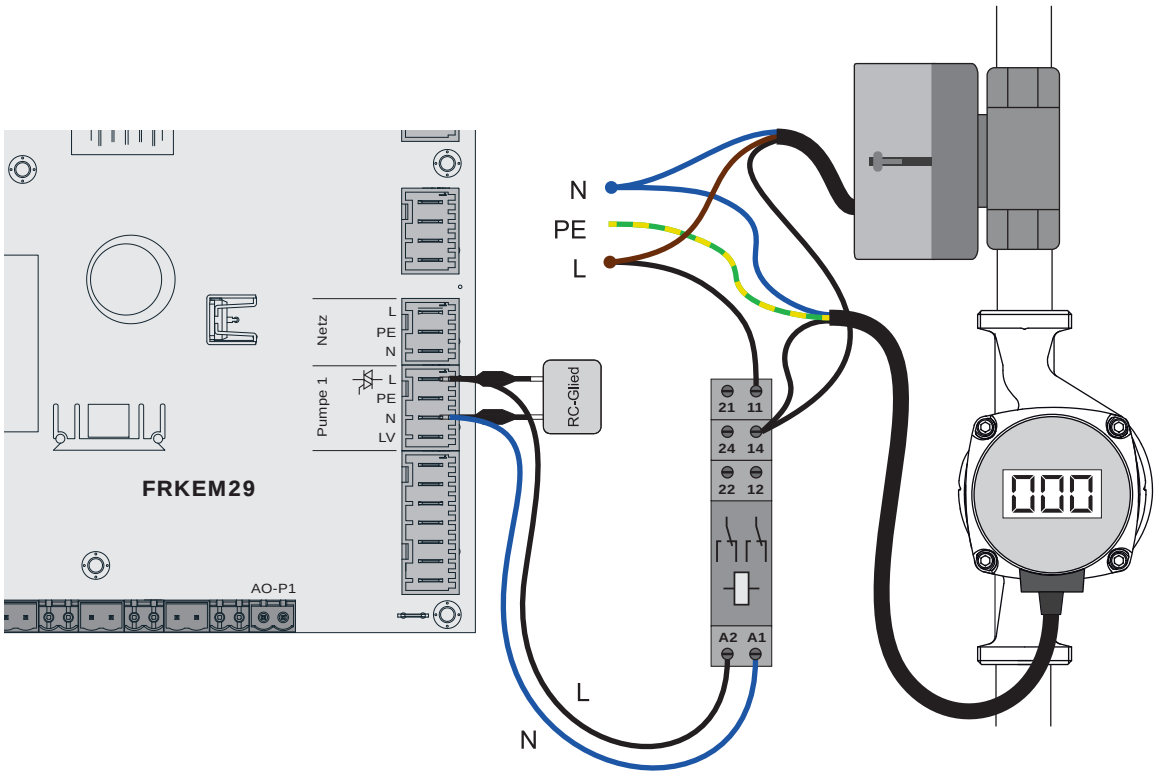
On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PDM or 0-10V signal.



- ❒ Using the RC element, connect the relay at the "Pump 1" output
- ❒ Connect the phase (L) of the power supply to the relay and the continuous supply to the valve (this switches the valve back into the initial position)
- ❒ Connect the neutral conductor (N) of the power supply to the pump and the valve
- ❒ Connect the protective earth conductor (PE) of the power supply to the pump
- ❒ Connect the phase (L) for switching over the valves together with the phase (L) for the pump to the switched output of the relay
- ❒ Connect the PWM cable of the high efficiency pump to the corresponding “PWM / 0-10V” port
  - ↳ Make sure that the cables are configured correctly (polarity) in accordance with the connection diagram of the pump!
- ❒ In the relevant menu, set the activation of the pump to “Field pump PDM + valve” or to “Field pump 0-10V + valve”

High efficiency pump without control signal

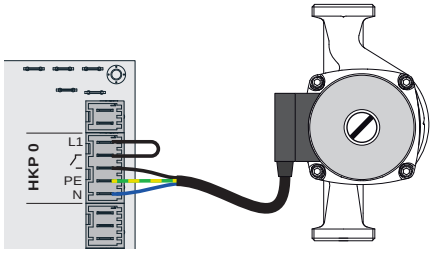
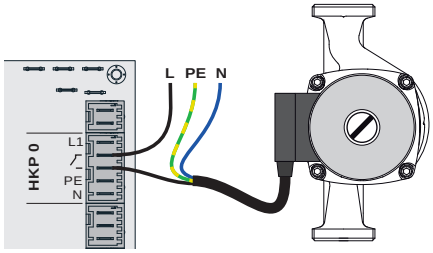
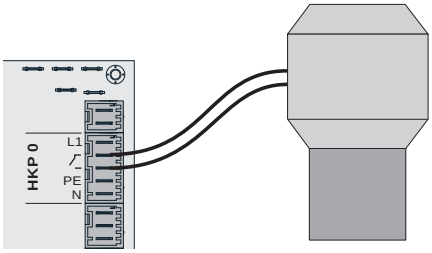
When this type of pump is used, the speed is not controllable! The use of a line regulating valve (e.g.: Setter balancing valve) is recommended!



- ❒ Using the RC element, connect the relay at the "Pump 1" output
- ❒ Connect the phase (L) of the power supply to the relay and the continuous supply to the valve (this switches the valve back into the initial position)
- ❒ Connect the neutral conductor (N) of the power supply to the pump and the valve
- ❒ Connect the protective earth conductor (PE) of the power supply to the pump
- ❒ Connect the phase (L) for switching over the valves together with the phase (L) for the pump to the switched output of the relay
- ❒ In the relevant menu, set the pump control to “HE pump without control signal”

2.1.8 Heating circuit pump 0 / burner relay

Depending on the system setting, the connection “Heating circuit pump 0” can be used for heating circuit pump 0 or as a burner relay. The following connection instructions must be observed:

Heating circuit pump 0		Burner relay
		
The pump can be supplied with up to a max. 2 Ampere directly via the output. During this process, phase (L1) of the output is connected to the switch contact.	The pump must be supplied externally with 2 Ampere. Up to max. 5 Ampere, the floating contact can used to switch the phase. At above 5 Ampere, the pump must be isolated with a relay.	Wire the floating output contact as an enabling signal to control the standby boiler.

2.1.9 Operating signal

On the core module (connection position KM-35), it is possible to issue a floating operating signal. The status is displayed under the “`Standby relay`” output in the “Manual” -> “Digital outputs” menu.

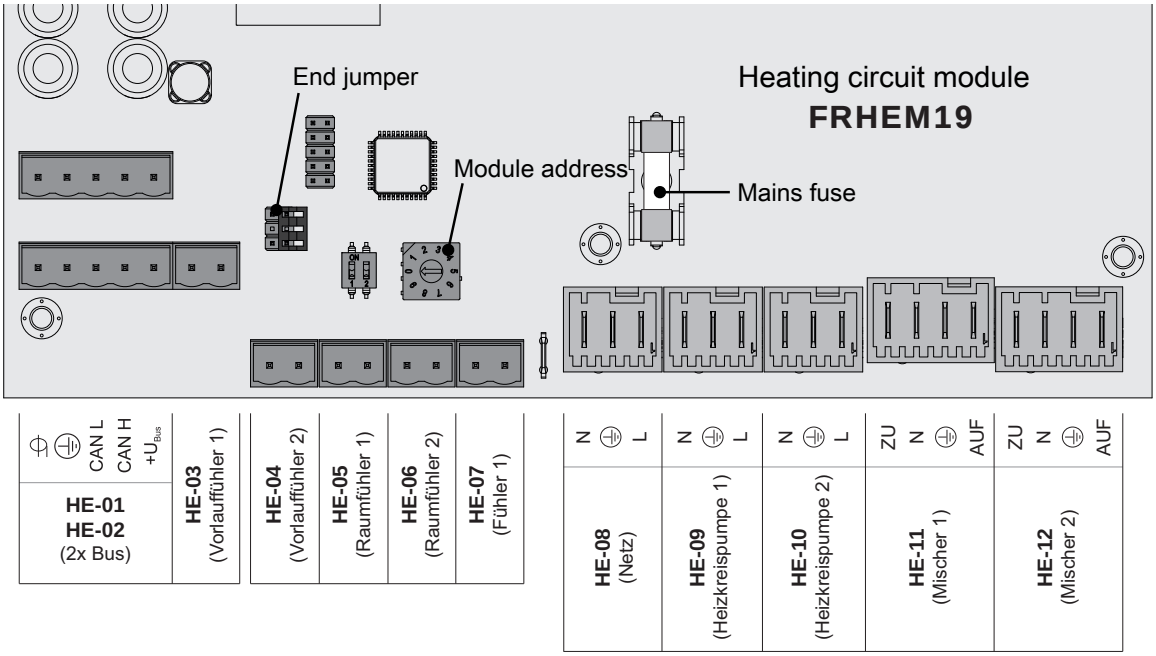
Operating status	Relay status
Boiler off, standby, fault	0
All other operating statuses (e.g. preparation, heating up, pre-heating, ignition, heating, slumber, cleaning, shutdown wait 1, shutdown wait 2, etc.)	1

2.2 Expansion modules

2.2.1 Heating circuit module

Two heating circuits can be controlled as standard with the core module.
To add further heating circuits, the heating circuit module boards must be expanded. Expansion can include up to eight heating circuit modules (addresses 0 to 7). A total of up to 18 heating circuits can be controlled. It is important to ensure that the module address is set correctly.

➲ "Setting the module address" [▸ 31]



Connection / Name		Note
HE-01	BUS	Connection with cable – LIYCY paired 2x2x0.5; ➲ "Connecting the bus cable" [▸ 30] Caution! CAN L and CAN H must not be connected to $+U_{BUS}$!
HE-02	BUS	
HE-03	Flow temperature sensor 1	Connection cable[1] 2 x 0.75 mm²;
HE-04	Flow temperature sensor 2	
HE-05	Room temperature sensor 1	Connection cable[1] 2 x 0.75 mm²; shielded if cable length greater than 25 m
HE-06	Room temperature sensor 2	
HE-07	Sensor 1	Connection cable[1] 2 x 0.75 mm²; Connection of the outside temperature sensor if it is not connected to the core module. The address of the heating circuit module to which the outside temperature sensor is connected must be set in the “Heating – General settings” menu. ➲ "Heating - General settings" [▸ 47]
HE-08	Mains	Connection cable[1] 3 x 1.5 mm², fuse 10A
HE-09	Heating circuit pump 1	Connection cable[1] 3 x 1.5 mm², max. 2.5A / 230V / 500W
HE-10	Heating circuit pump 2	
HE-11	Mixing valve 1	Connection cable[1] 4 x 0.75 mm², max. 0.15A / 230V
HE-12	Mixing valve 2	

1. YMM to ÖVE-K41-5 or H05VV-F to DIN VDE 0881-5

Fuses

F2	6.3 AT	HE-09, HE-10, HE-11, HE-12

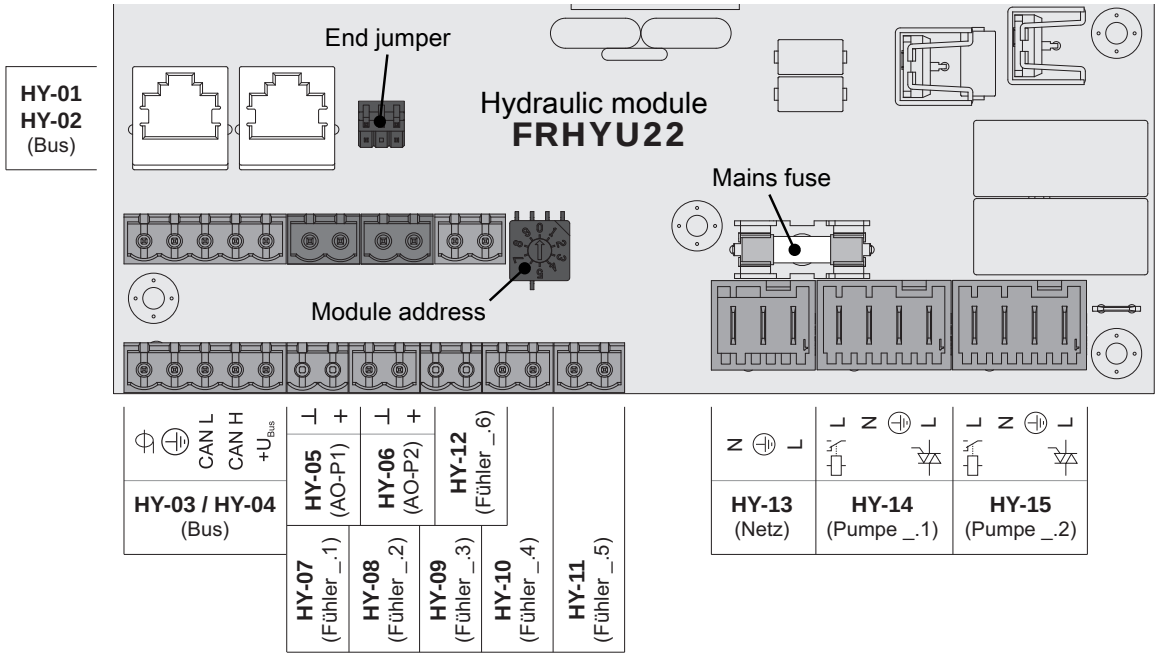
2.2.2 Hydraulic module

The hydraulic module makes the connections of sensors and pumps available for the hydraulic components of the system (buffer tank, DHW tank etc.).

A hydraulic module is included in the delivery as standard (address 0). A further seven modules (addresses 1 to 7) can be retrofitted.

You must ensure that the module address is assigned correctly! ➲ "Setting the module address" [▶ 31]

Hydraulic module starting with version FRHYU22



Connection / Name		Note
HY-01	BUS	Wire assignment of patch cable CAT 5 RJ45 SFTP 1:1; bus connection of the electrostatic precipitator
HY-02	BUS	Patch cable CAT 5 RJ45 SFTP 1:1 configuration
HY-03	BUS	Connection with cable – LIYCY paired 2x2x0.5; --- FEHLENDER LINK --- Caution! CAN L and CAN H must not be connected to $+U_{BUS}$!
HY-04	BUS	
HY-05	AO-P1	Slide-on duct cooling 0-10V
HY-06	AO-P2	Connection cable[1)] 2 x 0.75 mm² Connection of control signal for relevant pump
HY-07 : HY-12	Sensor _.1 : Sensor _.6	Connection cable[1)] 2 x 0.75 mm², shielded from 25 m cable length Sensor inputs on the board. The correct sensor designation is determined by the set module address (0-7). Example: Module address “2” = sensor 2.1 to sensor 2.6
HY-13	Mains	Connection cable[1)] 3 x 1.5 mm², fuse 10A
HY-14	Pump _.1	Slide-on duct cooling
HY-15	Pump _.2	Connection cable[1)] 3 x 1.5 mm², max. 1.5A / 230V / 280W Pump outlets from the board. The correct pump designation is determined by the set module address (0-7). Example: Module address “2” = pump 2.1 and pump 2.2 Depending on the type of pump, the phase (L) is either connected to the relay output or triac output. --- FEHLENDER LINK ---

1. YMM to ÖVE-K41-5 or H05VV-F to DIN VDE 0881-5

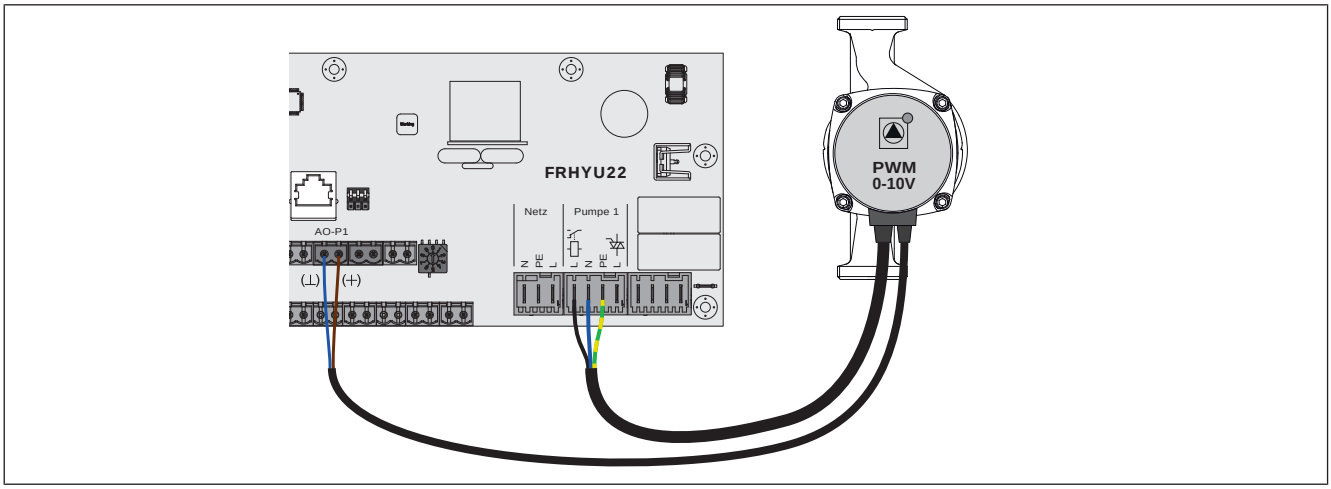
Fuses

F1	6.3 AT	HY-14, HY-15

Connecting a circulating pump to the hydraulic module

High efficiency pump with control line (PWM / 0-10V)

On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PDM or 0-10V signal.



❒ Connect the power supply for the high efficiency pump to output “Pump 1” or “Pump 2” and use the relay output for phase (L)

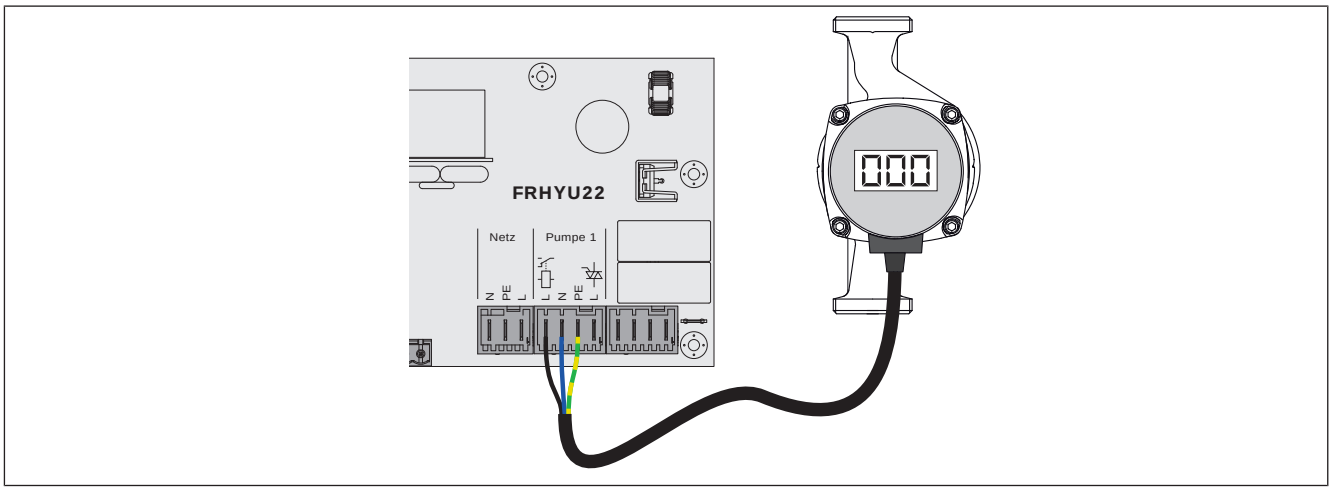
❒ Connect the PWM cable of the high efficiency pump to the corresponding port “AO-P1” or “AO-P2”

↳ Make sure that the cables are configured correctly (polarity) in accordance with the connection diagram of the pump!

❒ Set control of the pump in the relevant menu to “Field pump / PWM” or “Field pump / 0-10V”

High efficiency pump without control signal

When this type of pump is used, the speed is not controllable! The use of a line regulating valve (e.g.: Setter balancing valve) is recommended!

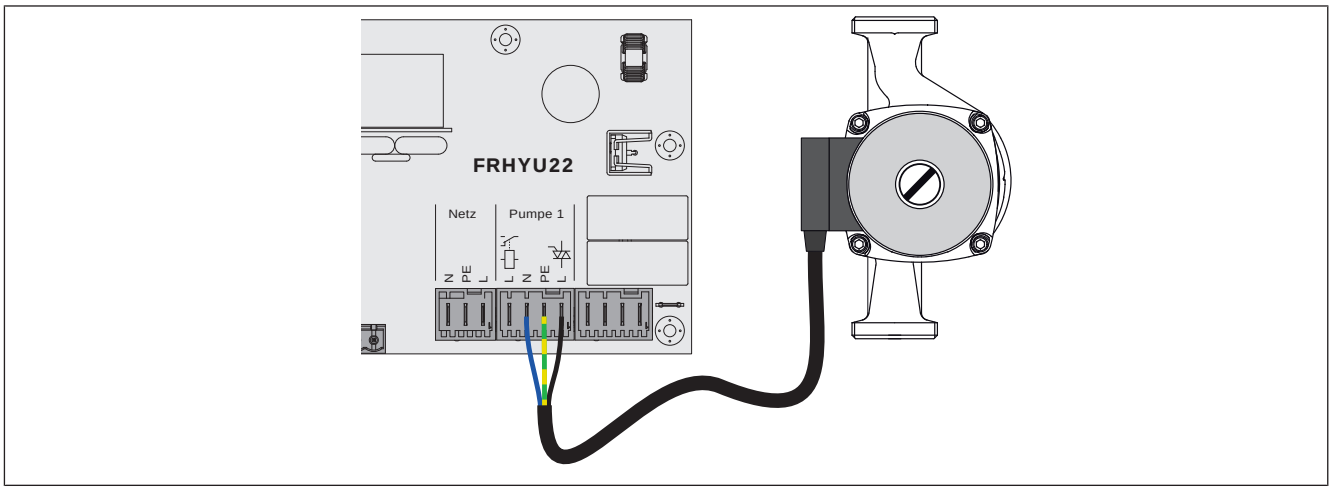


❒ Connect the power supply for the high efficiency pump to output “Pump 1” or “Pump 2” and use the relay output for phase (L)

❒ In the relevant menu, set the pump to “HE pump without control signal”

AC pump without control signal (pulse package control)

On older pumps without a control signal that are not highly efficient, the speed control is implemented via a pulse package control. Please note that the minimum speed may need to be adjusted on some pumps (default setting: 30%).

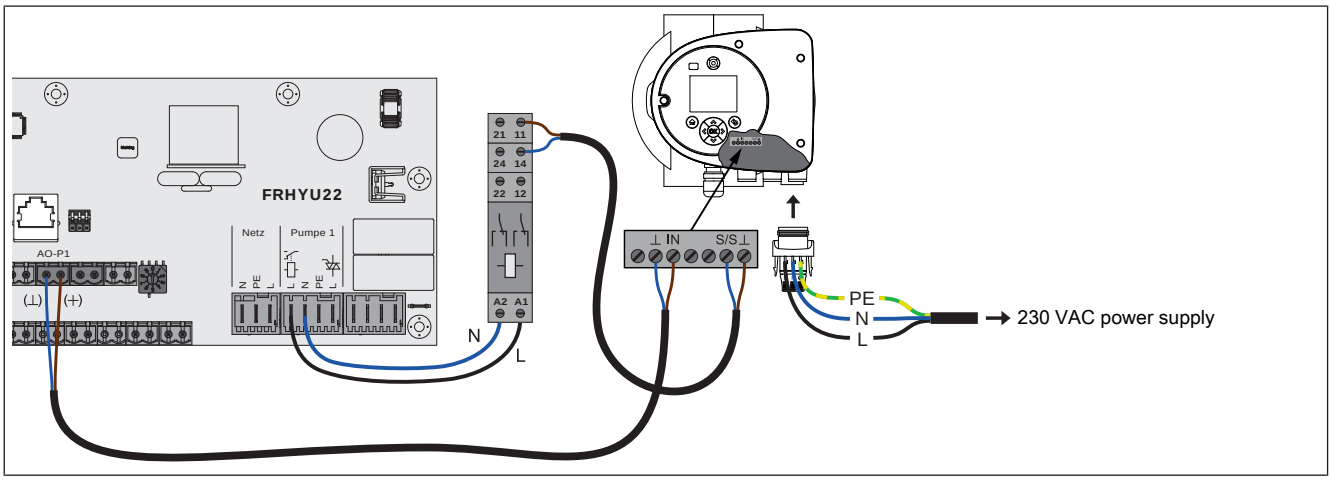


❒ Connect the power supply for the pump to output “Pump 1” or “Pump 2” and use the triac output for phase (L)

❒ In the relevant menu, set the pump to “Pump without control signal”

High efficiency pump with control signal and release contact

When using a high efficiency pump that requires a release contact in addition to the control signal (e.g. Grundfos Magna 3), the pump outlet of the hydraulic module is used to switch the release.



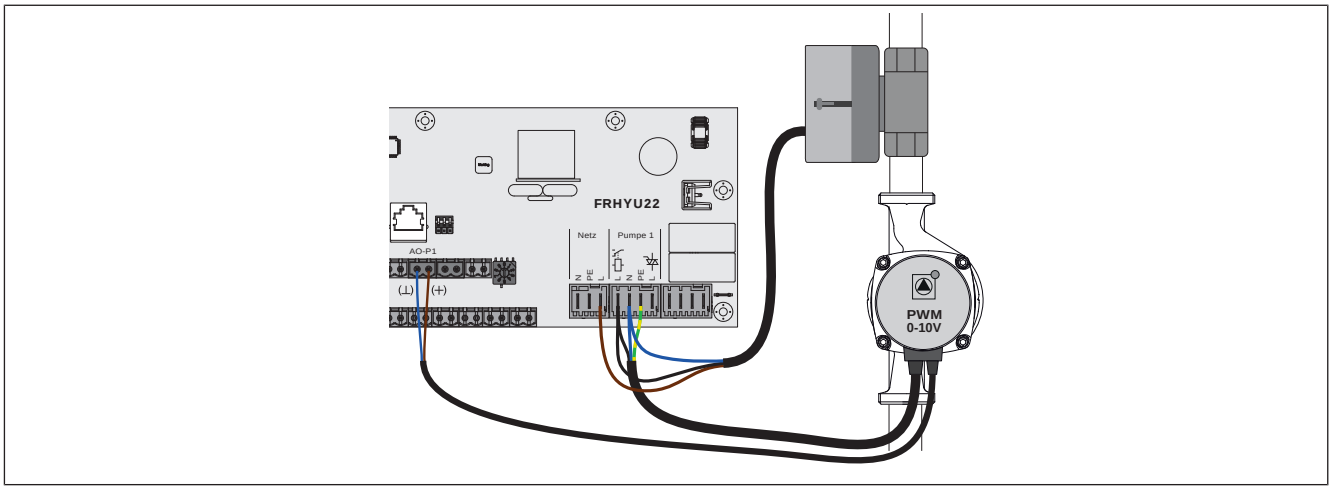
- ❒ Connect the pump relay to output “Pump 1” or “Pump 2” and use the relay output for phase (L)
- ❒ Install and connect two-pole cable (2 x 0.75 mm^2) from connection “AO-P1” or “AO-P2” to the pump and connect terminal “+” with terminal “IN” of the pump
- ❒ Install and connect two-pole cable (2 x 0.75 mm^2) from NOC on the relay to the pump using terminal “S/S” as the release contact
- ❒ Connect power supply at pump connector
- ❒ In relevant menu, set pump to “Field pump PDM + valve” or “Field pump 0-10V + valve”

Connecting a circulating pump with valve to the hydraulic module

WARNING! As of module version FRHYU22, one relay output is available at each of the pump outlets in addition to the triac output. Observe the following connection diagrams to correctly implement the wiring of the circulating pump!

High efficiency pump with control line (PWM / 0-10V)

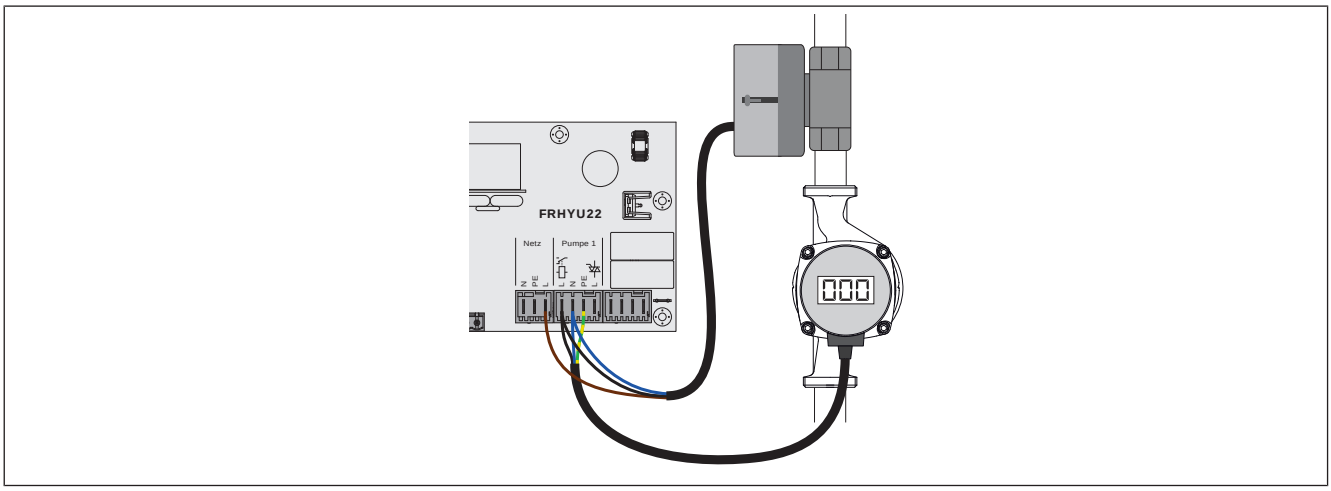
On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PDM or 0-10V signal.



- ❒ Connect the power supply for the high efficiency pump to output “Pump 1” or “Pump 2” and use the relay output for phase (L)
- ❒ Connect the phase (L) for switching over and the neutral conductor (N) of the valve to the output “Pump 1” or “Pump 2” using the relay output for the phase (L)
- ❒ Connect the phase (L) for continuous supply of the valve (switches the valve back to the initial position) to the power supply at terminal “L”
- ❒ Connect the PWM cable of the high efficiency pump to the corresponding port “AO-P1” or “AO-P2”
  - ↳ Make sure that the cables are configured correctly (polarity) in accordance with the connection diagram of the pump!
- ❒ In the relevant menu, set the activation of the pump to “Field pump PDM + valve” or to “Field pump 0-10V + valve”

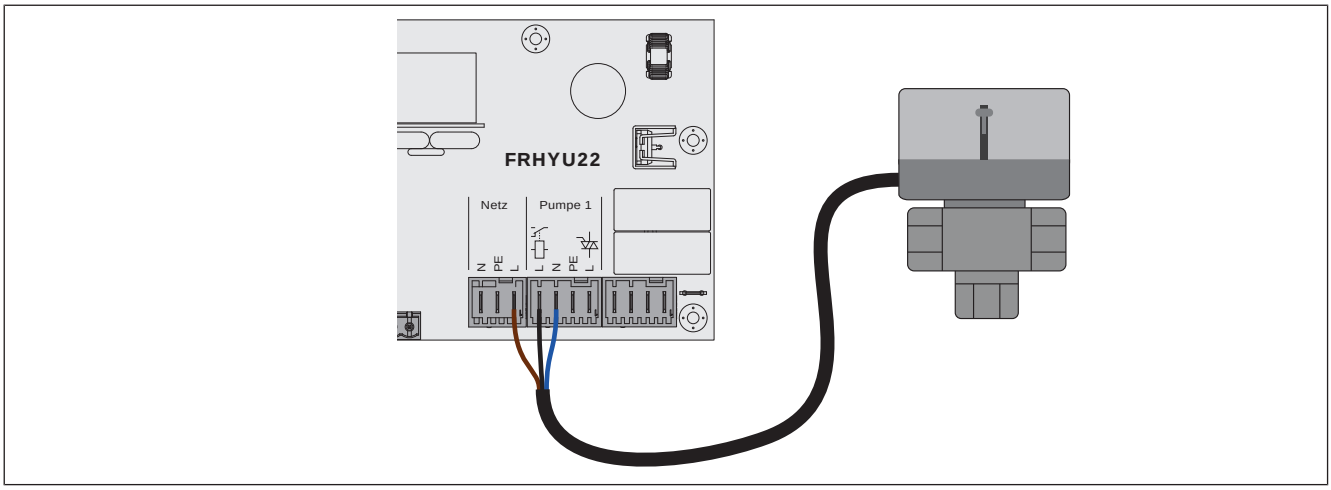
High efficiency pump without control signal

When this type of pump is used, the speed is not controllable! The use of a line regulating valve (e.g.: Setter balancing valve) is recommended!



- ❒ Connect the power supply for the high efficiency pump to output "Pump 1" or “Pump 2” and use the relay output for phase (L)
- ❒ Using the RC element, connect the phase (L) for switching over and the neutral conductor (N) of the valve to the output “Pump 1” or “Pump 2”
- ❒ Connect the phase (L) for continuous supply of the valve (switches the valve back to the initial position) to the power supply at terminal “L”
- ❒ In the relevant menu, set the pump to “HE pump without control signal”

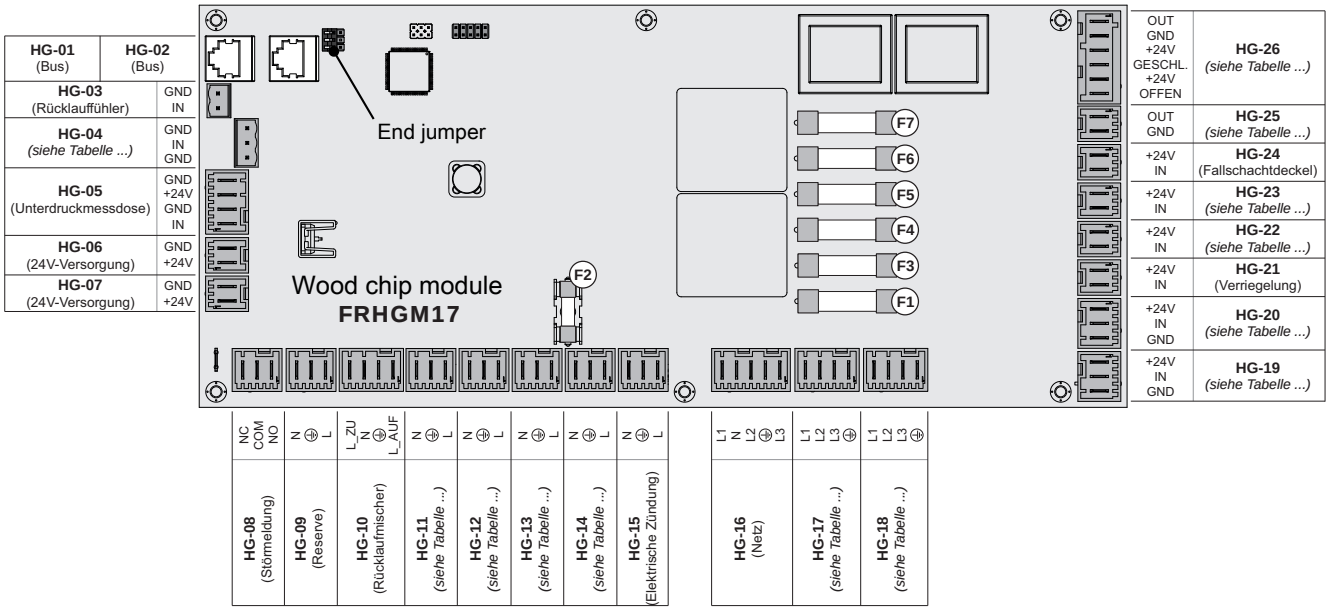
Connecting an isolating valve to the hydraulic module



- ❒ Phase (L) for switching the valve and connecting neutral conductor (N) to output “Pump 1” or “Pump 2” using the relay output for phase (L)
- ❒ Connect the phase (L) for continuous supply (switches the valve back to the initial position) to the power supply at terminal “L”

2.2.3 Wood chip module

The wood chip module is included in standard delivery and has the connections of the hardware components for the wood chip boiler:



Connection / Name		Note
HG-01	BUS	Patch cable CAT 5 RJ45 SFTP 1:1 configuration
HG-02	BUS	
HG-03	Return feed sensor	Connection cable[1] 2 x 0.75 mm²
HG-04	Combustion chamber sensor	Use connection cable of the component
HG-05	Underpressure transmitter	
HG-06	24 V power supply	Connection cable[1] 2 x 0.75 mm²
HG-07		
HG-08	Fault message	Connection cable[1] 3 x 1.5 mm²; floating changeover contact, max. 2A / 24V, 1A / 230V
HG-09	Light barrier gravity shaft	Connection cable[1] 3 x 0.75 mm²; normally open contact 24V
HG-10	Return mixer	Connection cable[1] 4 x 1.5 mm²; max. 0.15A / 230V
HG-11	Ash screw	Connection cable[1] 3 x 1.5 mm²
HG-12	Ash screw	Connection cable[1] 3 x 1.5 mm²
HG-13	Vibrator	Connection cable[1] 3 x 1.5 mm²
HG-14	WOS drive	Connection cable[1] 3 x 1.5 mm²
HG-15	Ignition	Use connection cable of the component
HG-16	Mains connection	Connection cable[1] 5 x 2.5 mm²; 400 VAC
HG-17	Feed screw	Connection cable[1] 4 x 1.5 mm²; max. 0.55kW / 400V
HG-18	Stoker screw	Connection cable[1] 4 x 1.5 mm²; max. 0.55kW / 400V
HG-20	Speed sensor WOS drive	Connecting cable[1] 3 x 0.1 mm²
HG-21	Lock	Connection cable[1] 2 x 0.75 mm²; 24V looping through
HG-22	Overpressure monitor	Connecting cable[1] 2 x 1.5 mm²
HG-23	Frequency converter induced draught fan	Connection cable[1] 2 x 0.75 mm²
HG-24	Gravity shaft cover	Connecting cable[1] 2 x 0.75 mm²; NO contact
HG-25	Frequency converter induced draught fan	Connection cable[1] 2 x 0.75 mm²

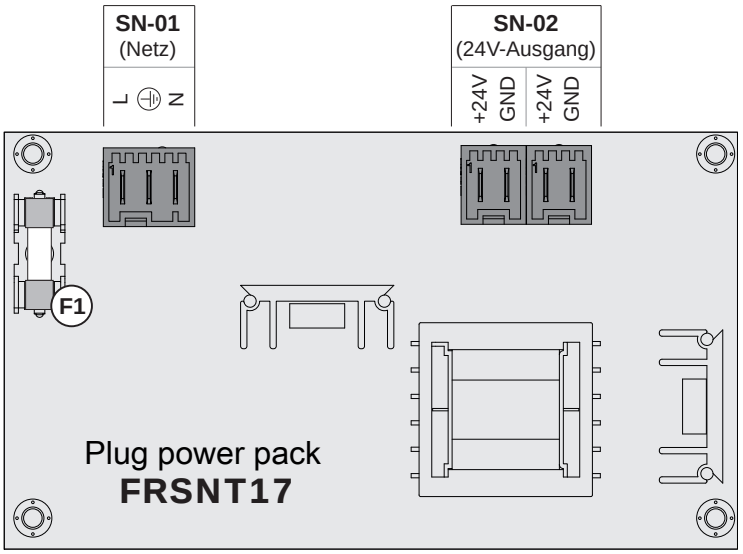
Connection / Name		Note
HG-26	Burn back flap	Connecting cable[1)] 7 x 0.75 mm²
1. YMM to ÖVE-K41-5 or H05VV-F to DIN VDE 0881-5		

Fuses

F1, F3, F6	2.5 AT	HG-18
F2	6.3 AT	HG-09, HG-10, HG-15
F4, F5, F7	2.5 AT	HG-17

2.2.4 Plug power pack FRSNT17

The plug power pack is designed to supply all of the system consumers with 24 VDC:

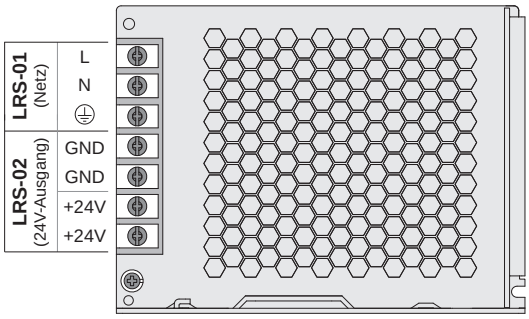


Connection / Name		Note
SN-01	Mains	Connection cable[1)] 3 x 1.5 mm²
SN-02	24 V power supply	Connection cable[1)] 2 x 1.0 mm², max. 2A
1. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0881-5		

Fuses

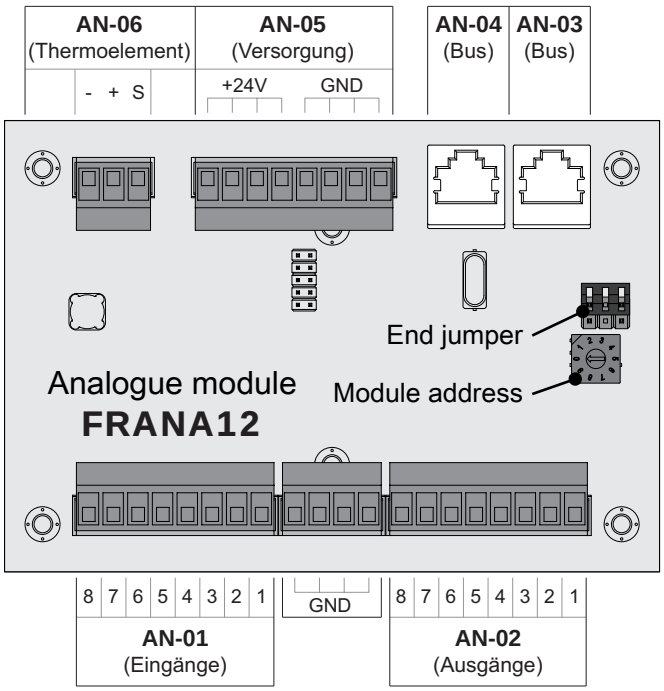
F1	2 AT	SN-02

2.2.5 Plug power pack Meanwell LRS-100-24



Connection / Name		Note
LRS-01	Mains	Connection cable[1)] 3 x 1.5 mm²
LRS-02	24 V power supply	2 outputs, max. 4.5A Connection cable[1)] 2 x 1.0 mm²
1. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0881-5		

2.2.6 Analogue module



Connection / Name		Note
AN-01	Inputs 1…8	Connection cable[1)] 1 x 0.75 mm²
AN-02	Outputs 1…8	Connection cable[1)] 1 x 0.75 mm²
AN-03	Bus	CAT 5 patch cable grey RJ45 SFTP 1:1 configuration
AN-04	Bus	
AN-05	Power supply	24 V power supply of the module, connection cable[1)] 2 x 1.0 mm² - Pellet boiler: 24 V power supply - pellet boiler and dual fuel boiler: Gravity shaft, terminal PM-12 or PM-13 at the pellet module - wood chip boiler: Supply via 24 V power supply unit
AN-06	Thermocouple	Use sensor connection
1. YMM to ÖVE-K41-5 or H05VV-F to DIN VDE 0881-5		

NOTICE! The inputs and output are pre-configured, so it is essential the following addressing is complied with.

Standard configuration – Analogue module with address 1

Thermocouple	Designation
Under-grate temperature sensor type “J“	

Input	Designation
1	Setting of the primary air flap FGR
5	External power specification 0-10V
6	FGR duct pressure measurement

Output	Designation
2	Setpoint of the FC for the combustion air blower fan
3	Setpoint of the FC for the induced draught

External power demand

The type of power demand can be set using the parameter “`Source for external power demand. (0 – off, 1 – 0-10 V, 2 – modbus)`“. The percentages are transferred directly if the power demand is made via modbus. If 0-10 V is selected as the source, the boiler release/boiler output can be controlled via an adjustable input at the analogue module using a voltage signal.

Method of operation for wood chip boiler and pellet boiler

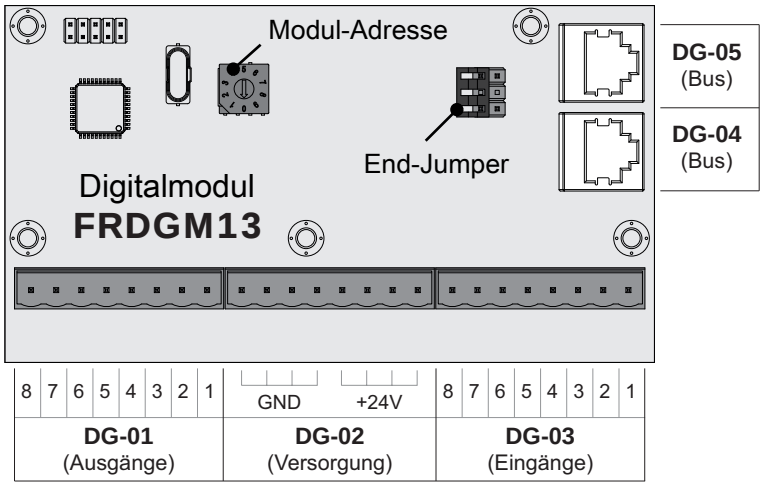
If the signal at the input is above 35%, the boiler starts in continuous load mode; if the signal drops below 30%, the boiler shuts down.

By default 0V = 0% and 10V = 100%. This can be changed using the “`Invert ext. power demand via analogue input`” parameter.

To initiate start-up via the power demand, “`Automatic`” mode must be selected and the contact must be closed if a release contact is used (“`Boiler release input available`” parameter = YES).

Necessary parameters for setting the power demand can be found in the “*Boiler – General settings*” menu.

2.2.7 Digital module



Connection / Name		Note
DG-01	Outputs 1…8	Connection cable[1)] 1 x 0.75 mm²
DG-02	Power supply	24 V power supply for the module, connecting cable[1)] 1 x 1.0 mm² Power supply via the 24 V power supply unit
DG-03	Inputs 1…8	Connection cable[1)] 1 x 0.75 mm²
DG-04	Bus	CAT 5 patch cable grey RJ45 SFTP 1:1 configuration
DG-05	Bus	

1. YMM to ÖVE-K41-5 or H05VV-F to DIN VDE 0881-5

NOTICE! The inputs and output are pre-configured, so it is essential the following addressing is complied with.

Standard configuration – Digital module with address 1

Output	Designation
1	Enable frequency converter
2	Enable combustion air fan
3	Ignition heating
4	FGR primary air flap open
5	FGR primary air closed
7	Grate drive

Input	Designation
1	Buffer charging pump 1 fault
2	Fault slide-on duct cooling
3	Safety switch ash container combustion chamber
4	Ash container heat exchanger safety switch
5	Speed sensor ash screw 1 combustion chamber
6	Thermal contact induced draught fan
7	Combustion air fan operating signal
8	Motor protection switch grate drive

Standard configuration – Digital module with address 2

Output	Designation
1	FGR flap open
3	External ash removal request

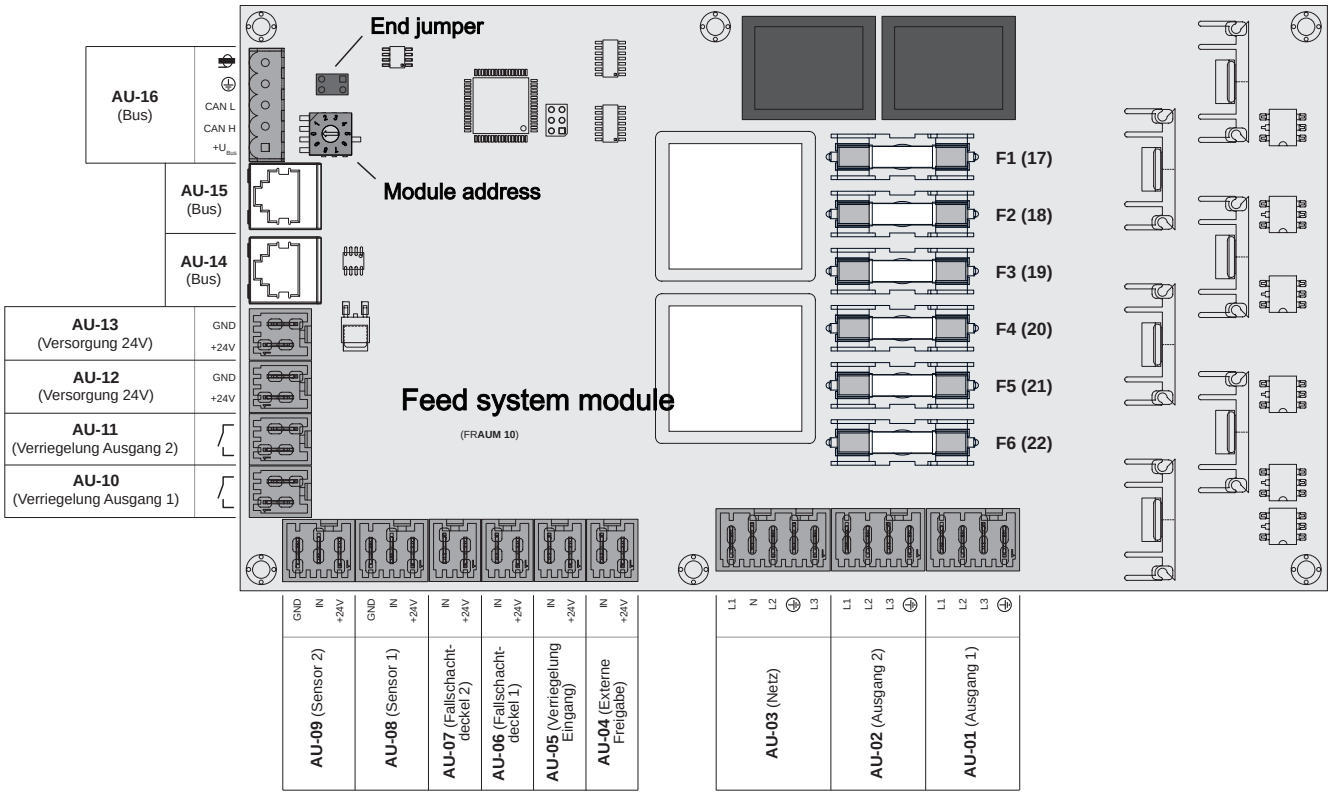
Input	Designation
1	FGR flap open
2	FGR flap closed
3	Stoker light barrier
4	Water shortage
5	Max/Min water pressure
6	STL 2

Standard configuration – Digital module with address 3

Input	Designation
1	Hydraulic pump motor protection switch
2	Hydraulic oil level sensor
3	Hydraulic oil temperature
4	Hydraulic chamber key switch
5	Safety limit switch
6	Light scanner 1
8	Light scanner 2

Output	Designation
1	Sliding floor on
2	Star-delta start-up 1
3	Star-delta start-up 2

2.2.8 Feed system module



Connection / Name		Note
AU-01	Screw 1	??
AU-02	Feed screw	Connecting cable[1] 4 x 1.5 mm²
AU-03	Mains connection	??
AU-04	External demand	Connection cable[1] 2 x 0.75 mm²
AU-05	Input latch	Connection cable[1] 2 x 0.75 mm²
AU-06	Gravity shaft cover 1	??
AU-07	Gravity shaft cover	Connecting cable[1] 2 x 1.5 mm²
AU-08	Light barrier 1	??
AU-09	Light barrier 2	??
AU-10	Lock output 1	Connection cable[1] 2 x 0.75 mm²
AU-11	Output 2 latch	
AU-12	24V power supply	
AU-13		
AU-14	ETHERNET	Patch cable CAT 5 RJ45 SFTP 1:1 configuration
AU-15		
AU-16	BUS	Port with cable – LICY paired 2x2x0.5; ➲ "Connecting the bus cable" [▶ 30] Caution! CAN L and CAN H must not be connected to $+U_{BUS}$!
YMM to ÖVE-K41-5 or H05VV-F to DIN VDE 0881-5		

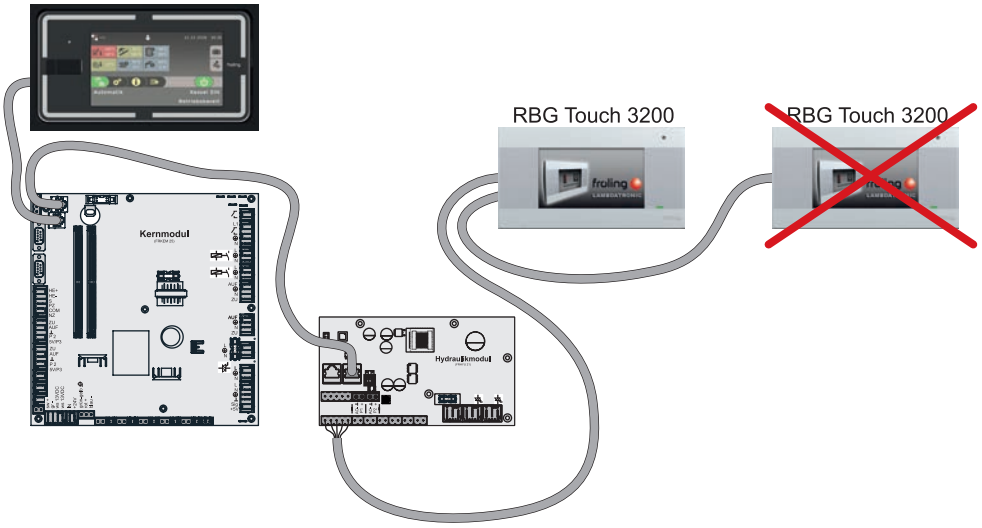
Fuses

F1, F3, F4	3.15 AT	AU-15
F2, F5, F6	3.15 AT	AU-16

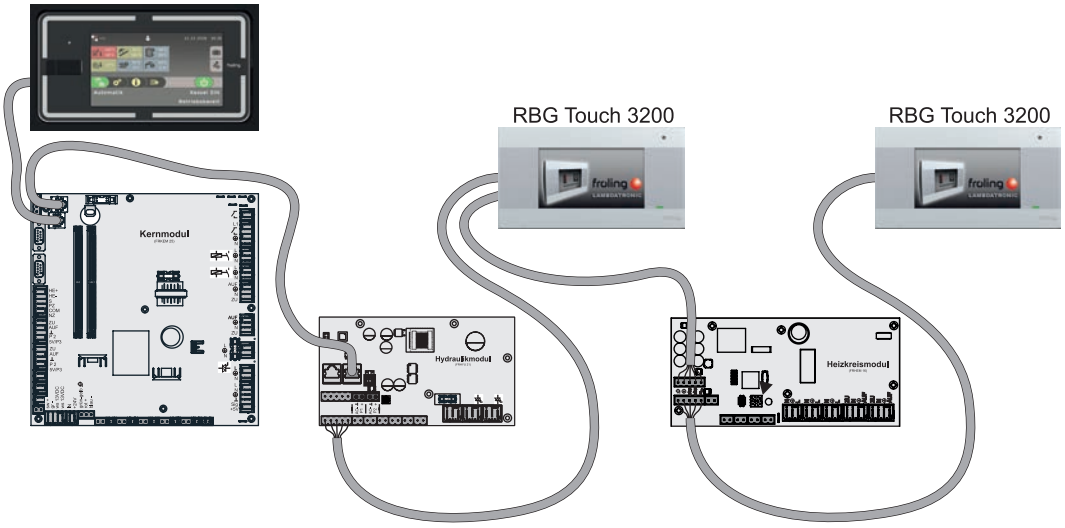
2.3 BUS connection

All of the bus models are connected with a bus line. The specification of the cable that is used must adhere to the LIYCY 2x2x0.5 type. A maximum cable length of 200 m must be observed. The cable length can be extended using the Fröling bus repeater.
The bus modules must be connected in series; although no specific sequence of the module types and addresses is specified. A star/stub cable is not permitted.

As the control units are supplied with voltage in addition to transferring data, problems caused by voltage drops can occur depending on the number of modules and existing cable lengths.



A voltage supply unit must be used for every touch room console (heating circuit module, hydraulic module).



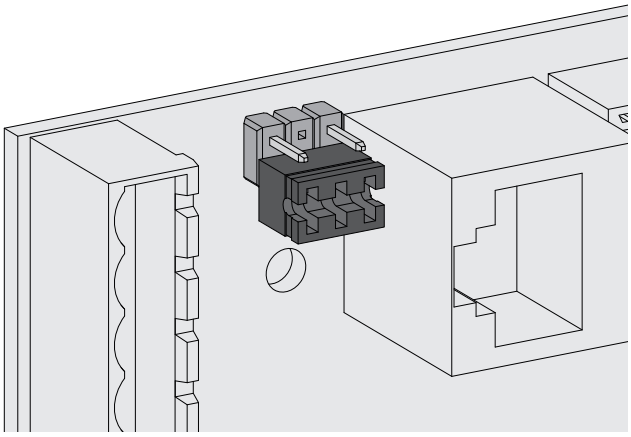
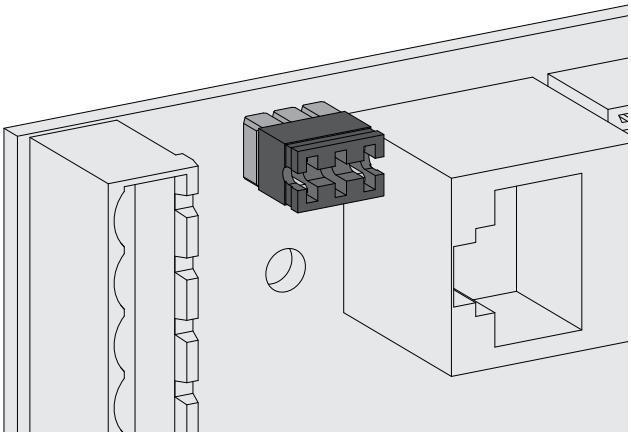
2.3.1 Connecting the bus cable

For the bus connections between the individual modules, cable type **LIYCY paired 2x2x0.5** should be used. The connection to the 5-pin plugs should be carried out according to the following diagram:

2.3.2 Setting end jumpers

NOTICE! To ensure smooth running of the bus system, the jumper must be set on the first and last module.

When using a bus repeater, the two galvanically separated sub-networks must be considered separately. The jumpers for each network must be set on the first and last module.

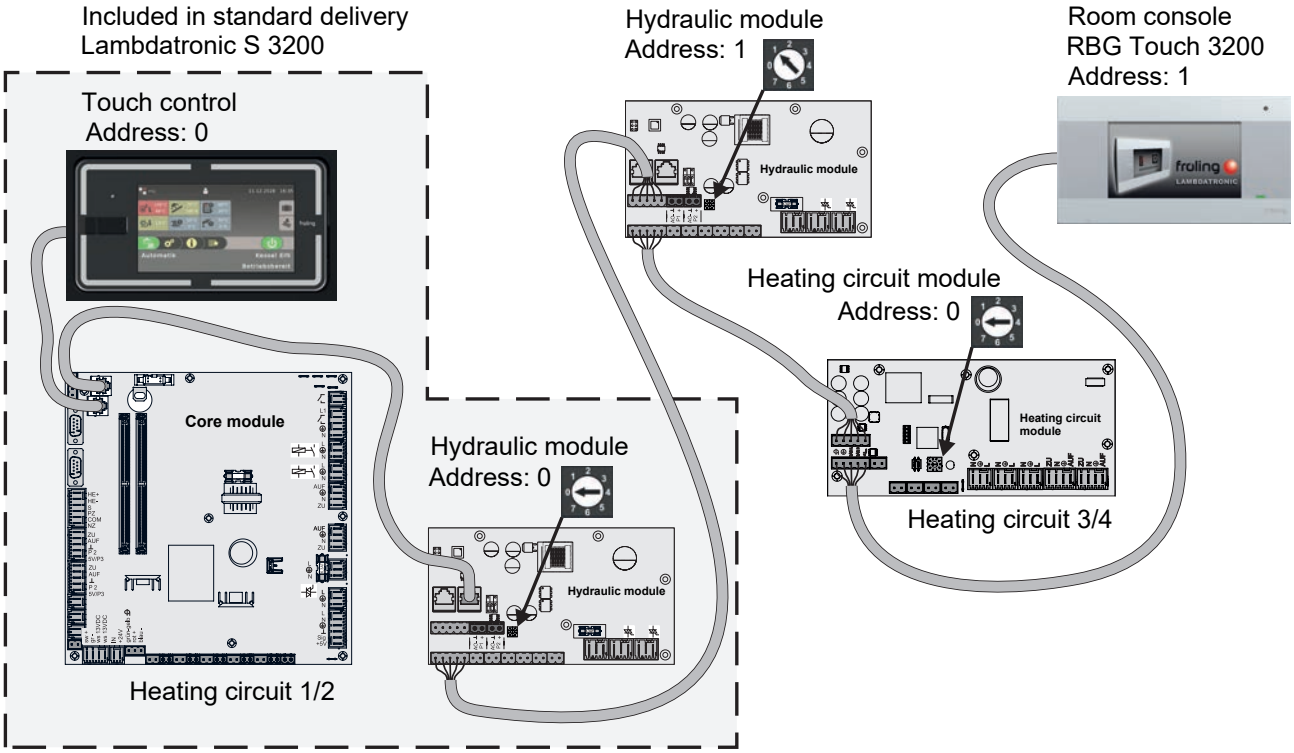
End jumper not set	End jumper set
	

If the contacts at the base of the end jumper are not bridged (image left), it is referred to as “not set". In this case there is no bus termination. If the contacts are closed (image right), the end jumper is set and the bus connection is terminated.

2.3.3 Setting the module address

The necessary order for hydraulic modules and heating circuit modules is set with the module addresses. The first board of a module type should always have the address 0, so that the standard hydraulic systems set do not have to be subsequently configured. For further module types rising module addresses (address 1 - 7) are set.

Important! Only set the module address when the device is disconnected from the power supply!

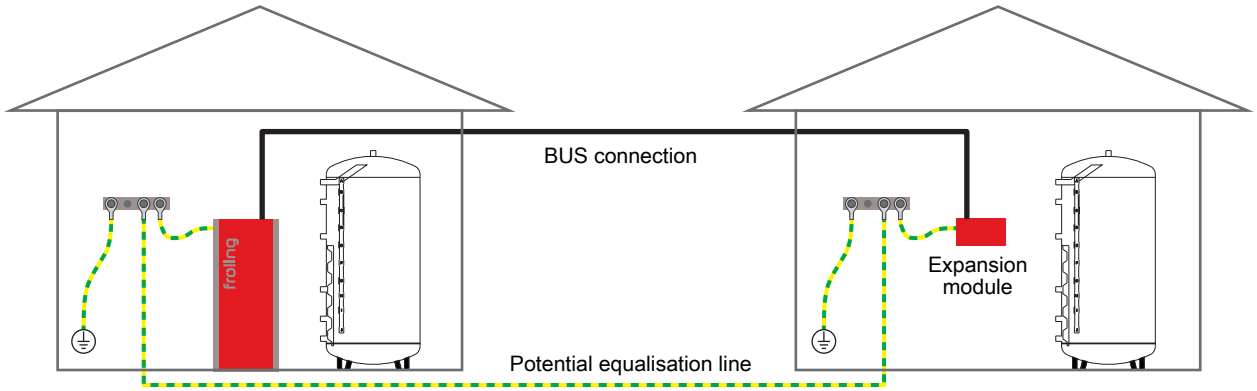


Module address set	Heating circuit module	Hydraulic module	
	Heating circuit	Sensors	Pump
0	03 – 04	0.1 – 0.6	0.1 – 0.2
1	05 – 06	1.1 – 1.6	1.1 – 1.2
2	07 – 08	2.1 – 2.6	2.1 – 2.2
3	09 – 10	3.1 – 3.6	3.1 – 3.2
4	11 – 12	4.1 – 4.6	4.1 – 4.2
5	13 – 14	5.1 – 5.6	5.1 – 5.2
6	15 – 16	6.1 – 6.6	6.1 – 6.2
7	17 – 18	7.1 – 7.6	7.1 – 7.2

2.3.4 Potential equalisation / potential separation

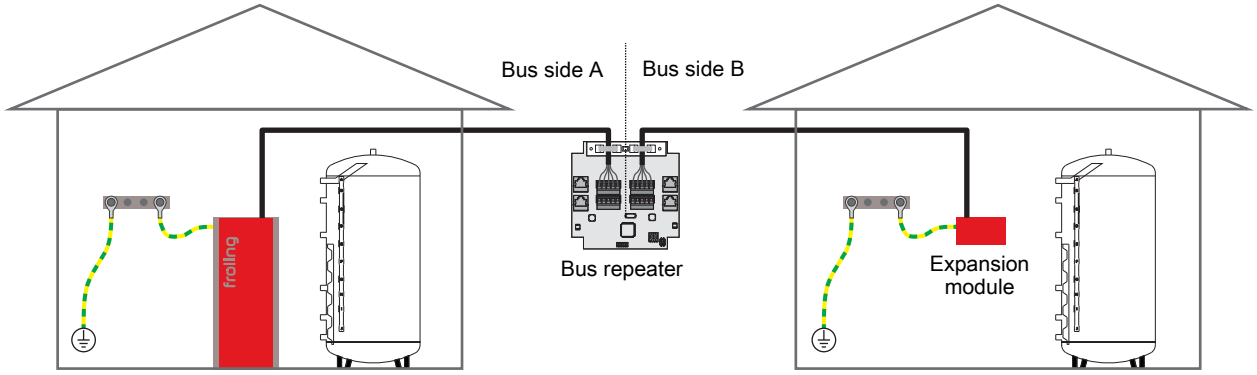
There can be potential shifts between buildings. In this case, equalising currents flow via the bus connection shield which can damage the modules.

To prevent this, buildings must be connected using a potential equalisation conductor.



NOTICE! The dimensions of the equalization line must be installed by a specialist in accordance with regional regulations.

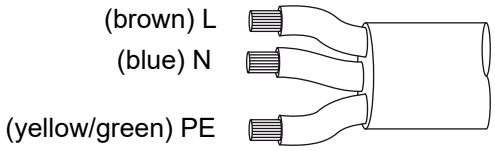
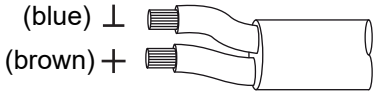
Instead of the potential equalisation, a Fröling bus repeater can be used in the bus connection line to the next building. The potential separation (galvanic isolation) allows the bus network to be split into two separate sub-networks.



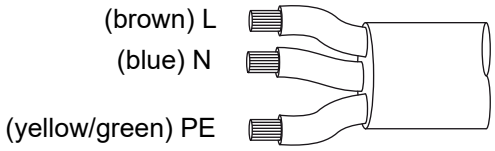
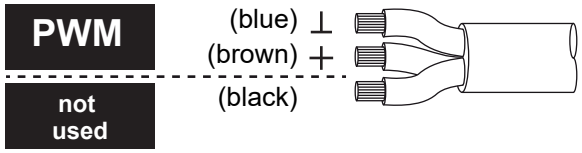
2.4 Connection information according to pump types

Either a 2-pin, 3-pin, or 4-pin control cable is used for the connection depending on the pump type. Please follow the connection instructions below for the wiring depending on the pump type used:

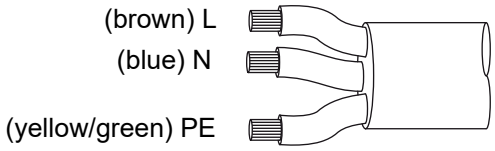
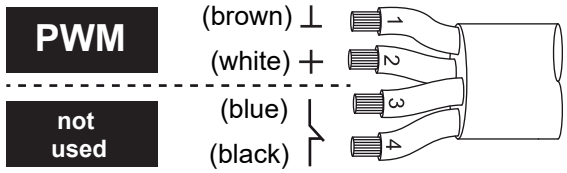
Pump type with 2-pin control cable

Power supply	2-pin control cable
	
Wire the power supply to the pump outlet on the board	Connect the control cable to the PDM output on the board, making sure that the polarity is correct: - blue wire to earth - brown wire to plus

Pump type with 3-pin control cable

Power supply	3-pin control cable
	
Wire the power supply to the pump outlet on the board	Connect the control cable to the PDM output on the board, making sure that the polarity is correct: - blue wire to earth - brown wire to plus Do not use the black wire and insulate if necessary

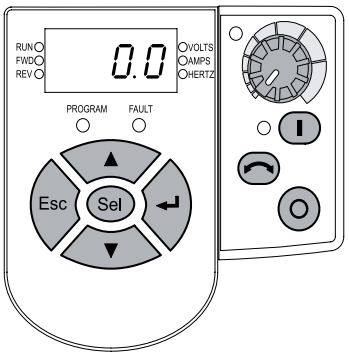
Pump type with 4-pin control cable

Power supply	4-pin control cable
	
Wire the power supply to the pump outlet on the board	Connect the control cable to the PDM output on the board, making sure that the polarity is correct: - brown wire to earth - white wire to plus Do not use the other two wires (blue, black) and insulate

2.5 Frequency converter

Below is a description of how the input elements of the frequency converter basically work.

2.5.1 Operating elements



Key	Name	Description
	Escape	Go back one step in the program menu. Cancel changes to a parameter value and exit program mode
	Select button	Go forward one step in the program menu. Select a digit when a parameter value is displayed
	Up arrow	Scroll down through groups and parameters. Increase/reduce the value of a flashing digit
	Down arrow	
	Enter	Go forward one step in the program menu. Save a change to a parameter value

2.5.2 Changing parameters

Step	Key	Description
1		Connecting the power supply
2		3x escape until “0.0” appears in the display
3		The group menu letter flashes when you press the Enter button
4	 or 	Press the arrow buttons to select the relevant group menu (d,P,t,C,A)
5		Enter the previously selected group menu. The digit on the right flashes and can be changed
6		Pressing the Sel button allows you to change the second digit from the right
7		Press the Enter button to see the value of the parameter, or press it again to change the value
8	 or 	Reduce/increase the value. **TIP**: Pressing the Sel button allows you to change the tens column, pressing it again allows you to change the hundreds column
9		Confirm the set value by pressing Enter
10		Press Escape several times to exit the program menu

Completing the parameter settings

After setting the parameters, you must restart the frequency converter to apply the new settings.

NOTICE

Malfunctions after setting parameters!

If the frequency converter becomes inoperable after setting the required parameters:

- ❒ Perform a factory reset
- ❒ Set the parameters again
  - ↳ The “Start”, “Back” and “Stop” buttons and the “potentiometer” usually have no function after the frequency converter has been programmed.

You can restore the factory settings by setting parameter P 112 to 1. The parameter then automatically returns to the value 0 and the frequency converter displays the message "F048".

3 Initial start-up with settings wizards

3.1 Before switching on for the first time

NOTICE

You should have the initial startup carried out by the authorised heating engineer from Froling customer services.

3.1.1 Controller check

- ❒ Check boards for foreign bodies (pieces of wire, washers, screws …)
- ❒ Carry out a wiring check:
  Check for loose, uninsulated wires, which could cause a short-circuit
- ❒ Check plug configuration of pumps, mixing valves and other units, which have NOT been prepared by Froling
- ❒ Check the connection of the BUS cable for short-circuits
- ❒ Check the specified addresses and terminal jumpers on the individual modules (heating circuit modules, hydraulic modules, displays…)

3.1.2 Check on the connected units

- ❒ Check that all units that are used are connected correctly
- ❒ Carry out wiring check:
  Check for loose or uninsulated wires in the terminal boxes of the pumps, mixing valve and switch valve, which could cause a short-circuit

3.1.3 System check

- ❒ Check that the main fuse for the boiler has a sufficient rated amperage

➲ "Mains connection" [▶ 8]

3.2 General information about the settings wizard

A wide variety of setting wizards are available to start-up the boiler system. A small selection of these can be found on the “Customer” operating level in the “Quick menu”; the rest are only on the “Service” operating level. The settings wizards can be used to set various sections of the boiler system (boiler, lambda probe, hydraulic system, etc.) with guided queries of the controller.

The following settings wizards are available for specific systems. Because they are interdependent, the sequence is automatically determined by the controller.

Icon	Designation
	**Switching on for the first time** Queries are made regarding language, facility number, date and time
	**Boiler** Setting for boiler type, boiler output, fuel, return temperature control and boiler-specific options (ignition, filter, etc.)
	**Lambda probe** Selection and calibration of the type of sensor used
	**Feed system** Selection of the existing discharge system (only for boilers with automatic loading)
	**Hydraulic system** Selection of the hydraulic system (hydraulic system 1, 2, 3, etc.)
	**Additional components** Selection and activation of the existing load and control components (heating circuits, DHW tank, solar, difference controller, etc.)
	**Heating up** Initial filling of the pellet container for pellet and dual fuel boilers; filling of the discharge screw and defining the loading times for the start process for wood chip boilers
	**Connect** Setting parameters required for the boiler to use the “froeling-connect.com” online control (IP address, display password, etc.)
	**Heating up program** Activation and selection of a heating up program.

3.3 Switching on for the first time

Once you have connected the device to the power supply and switched on the main switch, the display begins with a query regarding the basic settings of the system (language, production number of the boiler system, date, and time). Then the basic screen of the touch display is shown.

1: Selection of the controller language

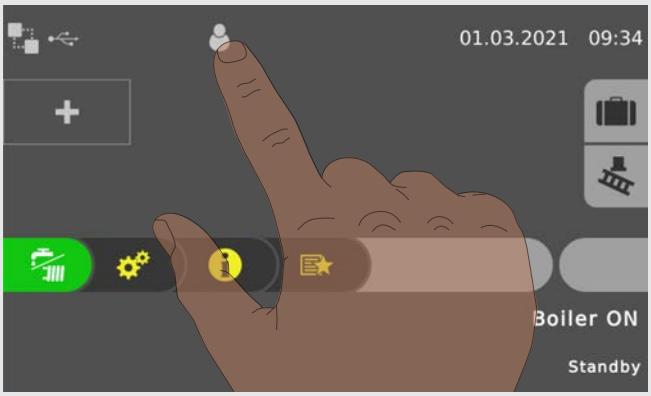
2: Setting the production number (see identification plate)

3: Setting the date and time

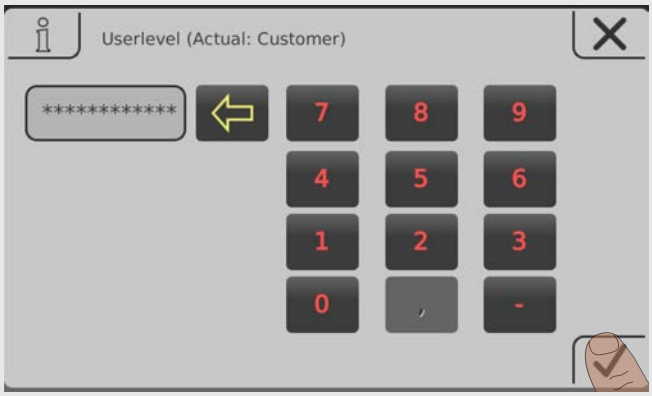
4: Display of the basic screen

3.4 Starting the setting wizard

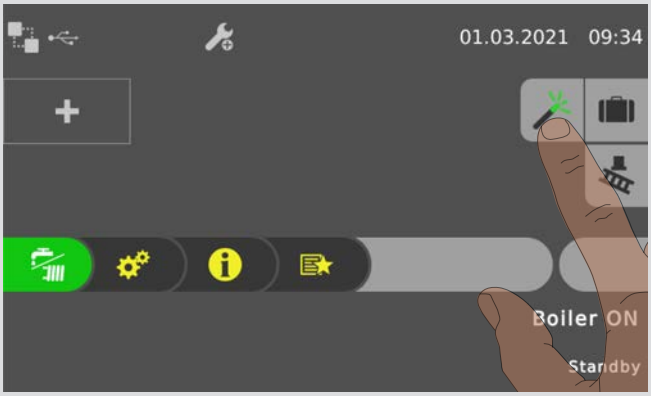
1: Tap the icon to change the user level



2: Type in the service code and confirm

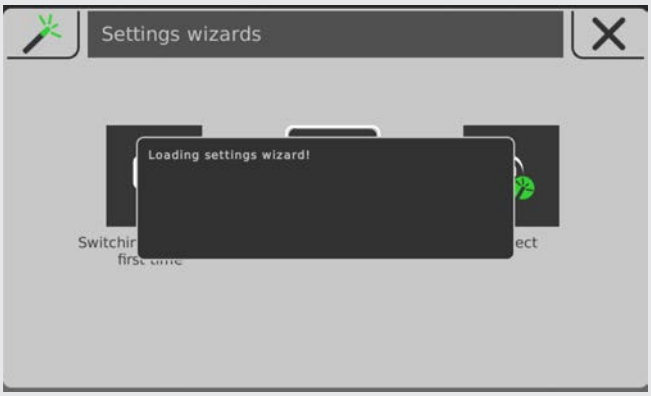


3: Tap the icon of the settings wizard



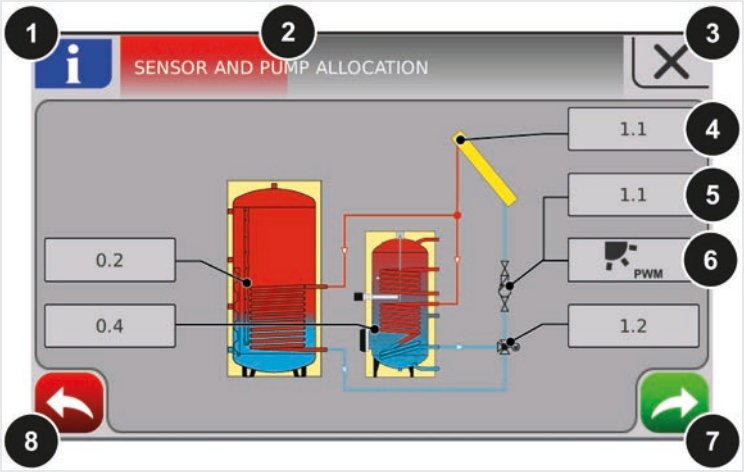
4: Tap the “Boiler” setting wizard

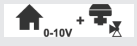
5: The settings wizard loads



6: Read the information text and continue with “YES” to start

Navigation as well as sensor and pump settings



Number	Description	
1	If the Info button has a blue background, more information is available for this overview page.	
2	Progress bar for the respective settings wizards	
3	Cancel setting wizard	
4	Setting the address to which the respective sensor was connected	
5	Setting the address to which the respective pump was connected	
6	Defining the control signal of the respective pump. The following options are available depending on the selected menu:	
		Pump without control line
		HE pump without control line
		Field pump / PDM
		Solar pump / PDM
		Field pump PDM + valve
		Solar pump PDM + valve
		Field pump / 0 - 10 V
		Solar pump / 0 – 10 V
		Field pump 0-10 V + valve
		Solar pump 0-10 V + valve
		Switch valve
	➲ "Activation options of pump outlets" [▶ 95]	
7	Continue to the next step	
8	Go back one step	

4 Parameters overview

4.1 Heating

4.1.1 Heating - Status

System menu Heating

Heating circuit mode
Display and setting the heating circuit mode:
Auto: Automatic: heating phases according to the set heating times
Extra heating: The heating circuit is regulated to the set room temperature with no time limitation. To cancel this function, activate another mode/function
Setback: Setback mode; the current or next heating phase is ignored
Continuous setback mode: Heating circuit remains in setback mode until another mode is activated
Party: Party mode; the current or next setback phase is ignored

Heating circuit mode
OFF: Switched off; heating circuit deactivated, only frost protection!

Actual flow temperature
Display of the current flow temperature.

Room temperature
Prerequisite: Heating circuit used in conjunction with remote control Display of the current room temperature.

Outside air temperature
Display of the current outside air temperature.

4.1.2 Heating – Temperatures

System menu Heating

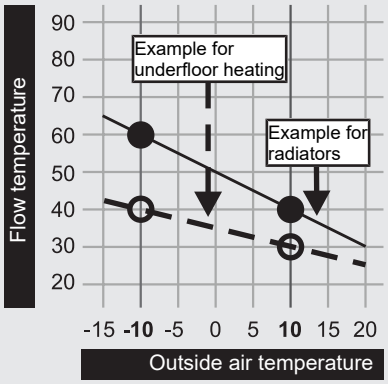
Desired room temperature during heating mode
Prerequisite: Heating circuit used in conjunction with remote control Room temperature which is regulated during the set heating times.

Desired room temperature during setback mode
Prerequisite: Heating circuit used in conjunction with remote control Room temperature which is regulated outside of the set heating times.

Flow temperature SP at outside air temperature of +10°C
First setting point for definition of heating curve.

Flow temperature SP at outside air temperature of -10°C

Second setting point for definition of heating curve.



Controller gain at room temperature Kp-Rm

Prerequisite: Heating circuit used in conjunction with remote control

Influencing factor of room temperature on the flow temperature of the heating circuit. If there is a deviation in the room temperature of +/- 1°C, the set value of the flow temperature is corrected by this value. (Only in conjunction with remote control)
Recommended values:

- Underfloor heating: 2-3
- Radiators (new build): 4-5
- Radiators (old build): 6-7

NOTICE! Observe external influences on the remote control!

Reduction of flow temperature in setback mode

The flow temperature is reduced by this value during setback mode.

External temperature, at which heating circuit pump switches off in heating mode

If the outside air temperature exceeds this value during heating, the heating circuit pumps and mixing valve are deactivated.

External temperature, at which heating circuit pump switches off in setback mode

If the outside air temperature falls below this value in setback mode, the heating circuit pumps and mixing valve are activated.

Maximum heating circuit flow temp

Maximum temperature for limiting outfeed temperature at which the heating circuit is supplied.

Maximum DHW tank flow temp

If DHW tank 1 is supplied directly from heating circuit 1, you can limit the maximum flow temperature for the duration of DHW tank loading.

Frost protection temperature

If the room temperature or the flow temperature is lower than the set value, the heating circuit pump will be switched on and the heating circuit mixer keeps to the maximum heating circuit flow temperature that is set.

From which temperature at top buffer tank should the overheating protection be activated

If the temperature at top buffer tank exceeds the set value, the heating circuit is activated regardless of mode (boiler, remote control) and set heating times. The flow temperature is controlled to the value set in the parameter "`Flow temperature SP at outside air temperature of -10°C`". The function will remain active until the value falls below 2°C.

Recommendation: The overheating protection should be assigned to a high temperature heating circuit (e.g. radiators).

Deviation of room temperature sensor

If a deviation of the room temperature is determined from the evaluated value to the displayed value, the evaluation of the room temperature sensor can be adjusted with this parameter. The temperature measured by the sensor is increased (positive value) or reduced (negative value) by the pre-set value.

4.1.3 Heating - Times

➲ "Setting times" [▸ 105]

4.1.4 Heating - Service

Heating circuit pump

Used for testing the pump output:

- **A 0**: Automatic, Off; **A 1**: Automatic, On
- **1**: Manual, On
- **0**: Manual, Off

Heating circuit mixer OPEN

Used for testing the mixing valve output:

- **A 0**: Automatic, Off; **A 1**: Automatic, On
- **1**: Manual, On
- **0**: Manual, Off

Heating circuit mixer CLOSED

Used for testing the mixing valve output:

- **A 0**: Automatic, Off; **A 1**: Automatic, On
- **1**: Manual, On
- **0**: Manual, Off

Mixer runtime

Here you can set the mixer runtime of the mixer in use.

Switch off heating circuit pump when outfeed setpoint is lower than

Prerequisite: Heating circuit is operated without remote control

If a flow temperature setpoint is calculated below the value set, the heating circuit pump switches off and the mixing valve closes.

Should this heating circuit heat when there is DHW tank priority?

- **NO**: During DHW tank loading this heating circuit is deactivated.
- **YES**: Despite active DHW tank priority, this heating circuit is supplied with heat during DHW tank loading.

From which buffer tank or distributor is the heating circuit supplied (0 = boiler)

Prerequisite: Parameter can only be used in conjunction with multiple house systems (variants)

This parameter defines the allocation of the heat source for this heating circuit.

- **0** = Boiler
- **1** = Buffer tank 01, …

High temperature requirement because of DHW tank loading

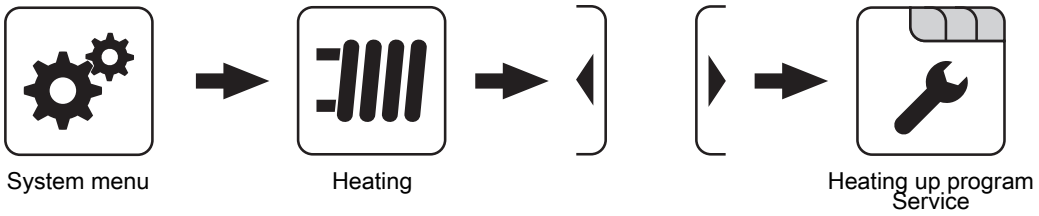
IMPORTANT! Parameter is available only for heating circuits 1 and 2!

Set Pellet as the unit model for “DHW tank 1” in the case of pellet boiler PE1!

- **No DHW tank**: the heating circuit is operated according to the selected heating curve
- **DHW tank 1**: only DHW tank 1 is supplied via the heating circuit
- **DHW tanks 2-8:** all DHW tanks apart from DHW tank 1 are supplied via the heating circuit
- **All DHW tanks:** all DHW tanks are supplied via the heating circuit

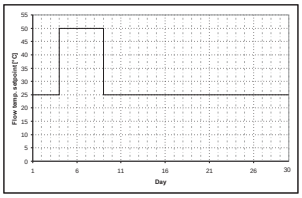
The DHW tank can be loaded via the heating circuit. If there is a requirement from the DHW tank and the criteria for DHW tank loading have been met, the switch valve immediately clears the way for DHW tank loading. The heating circuit pump starts running as soon as the criterion “Load if temperature difference between boiler and DHW tank is” is satisfied. Once DHW tank loading is complete, the heating circuit pump will stop, the switch valve will remain active for a specified period of time and the heating circuit mixer will close. If time has run out, the heating circuit will go back to being supplied on a weather-compensated basis.

4.1.5 Heating - Heating up program

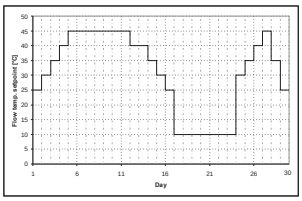


Heating up programs

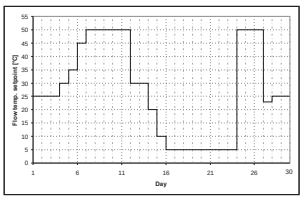
Heating up program 1:



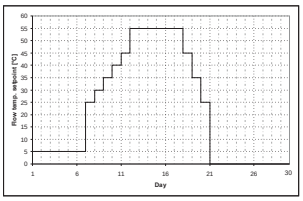
Heating up program 2:



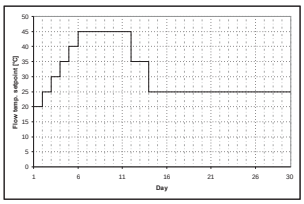
Heating up program 5:



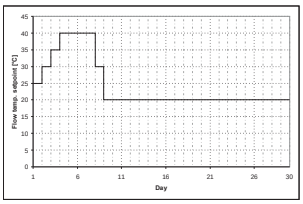
Heating up program 6:



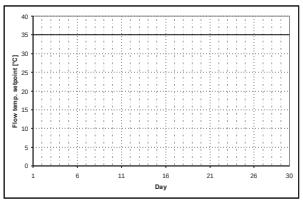
Heating up program 3:



Heating up program 4:

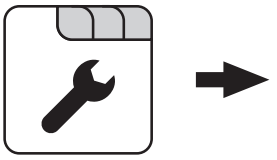


Heating up program 7:



The heating up programs listed are non-binding recommendations. If the heating up program is to be used for floor screed drying, you must consult the manufacturer of the floor finish and/or the installer!

Configure program 8



Configure program 8

Heating up program
Service

Outfeed temperature setpoint on day 1 … 30
If “heating up program 8” is selected, the flow temperature setpoint can be preset for each day using this setting.

Heating circuits used

Heating up program
Service

→ Heating circuits used

Using heating circuit 01 … 18

The number of heating circuits used depends on the system configuration. If only 2 heating circuits are installed, then only 2 heating circuits will be available for selection.
The heating up program selected will be used for all heating circuits!

Heating up program - Service

Heating up program active

- **NO**: The heating up program is deactivated. When the heating up program deactivated, all heating circuits are operated according to the selected heating times.
- **YES**: The 30-day heating up program that has been set starts. After the 30 days, the heating circuit that has been selected operates based on the set heating times again.

The heating times of the selected heating circuit, as well as the boiler/buffer tank loading times are automatically set to 0:00-24:00 and the outside air temperature heating limit is ignored.

When using a firewood boiler, a sufficient heat supply must be ensured.

If the actual flow temperature setpoint required cannot be reached or maintained (e.g. boiler output, …), then no warning is displayed!

In the event of a power failure, the program continues from the point at which it was interrupted!

The parameter “Maximum heating circuit flow temperature“ is not automatically adjusted when the heating up program is activated, and must be raised to the desired temperature for the set duration. The building temperature limits must also be adjusted for the duration of the heating up program.

If the current room temperature falls below the set frost protection temperature setpoint, this influences the set flow temperature setpoint of the heating up program.
NOTE: Only in conjunction with remote control!

Current day of the heating up program

Shows the current day of the heating up program that is running. By adjusting this parameter, you can skip forward or return to a specific day of the program.

Which heating up program is used

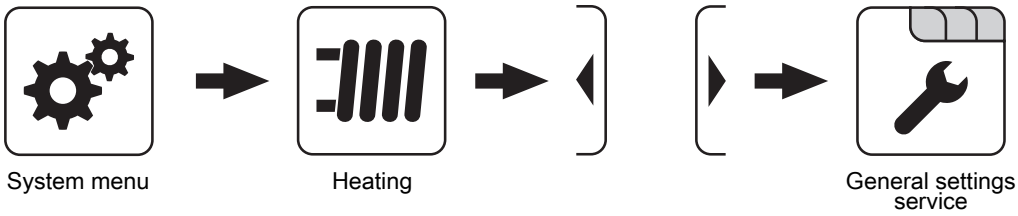
There are set options for the progression of the flow temperature in heating up programs 1 – 6. With heating up program 7 the flow temperature can be selected freely over the entire 30 days.

Heating up program 8 allows you to pre-define the progression of the flow temperature for each individual day.

Outfeed setpoint for all days in program 7

If heating up program 7 is active, the selected heating circuit is adjusted to the specified flow temperature.

4.1.6 Heating - General settings



Correction value for external sensor

If it is found that the evaluated value for the outside temperature value deviates from the displayed value, the evaluation of the outside temperature sensor can be adjusted using this parameter. The temperature measured by the sensor is increased (positive value) or reduced (negative value) by the pre-set value.

Heating circuit module to which the external sensor is connected (0 = core module)

If the outside temperature sensor is not connected to the core module, the address of the relevant heating circuit module +1 must be set here (sensor 1 on relevant module).

Using room sensor inputs for room thermostat

NOTICE! This parameter influences all sensor connections to which an analogue room temperature sensor can be connected!

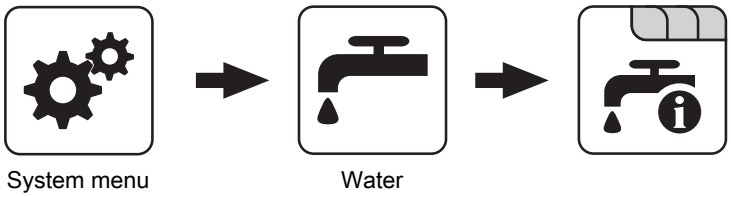
- **NO**: At the sensor connector of the room sensor, a room sensor must be connected to control the room temperature.
- **YES**: At the sensor connector of the room sensor, room thermostats can be connected to control the room temperature.

Contact of room thermostat open: Heating circuit pump deactivated, mixing valve is closed

Contact of room thermostat closed: Heating circuit pump and mixer control active

4.2 Water

4.2.1 Water - Status



DHW tank top temperature

Current temperature of the DHW tank. If the time window for DHW tank loading is reached and the temperature falls below the value set under parameter "`Reload if DHW tank temperature is below`", the DHW tank will be loaded. The DHW tank is loaded either until the time window has elapsed or the temperature set under "`Desired DHW tank temperature`" has been reached.

DHW tank bottom temperature

Prerequisite: Solar panel system is regulated by Froling!

Current temperature in the area of the reference sensor of the solar panel system.

DHW tank pump control

Specifies the speed of the DHW tank pump as a percentage of maximum speed.

4.2.2 Water - Temperatures

System menu Water

Set DHW temperature

When this DHW temperature is reached, DHW tank loading is stopped.

Reload if DHW tank temperature is below

If the DHW tank temperature falls below the value set here, the time window is active and the loading source (boiler or buffer tank) indicates the set loading increase, and the DHW tank loading is started.

Load if temperature difference between boiler and DHW tank is

If the boiler temperature is above the current DHW tank temperature by this value and the time window is active, DHW tank loading starts (only for systems without a buffer tank).

Setpoint for temperature difference between boiler and DHW tank

Adjust the boiler temperature setpoint to reach the desired DHW tank temperature.

Boiler temperature setpoint = Set DHW temperature + difference

If the current boiler temperature setpoint calculated is higher than the result from the above calculation, the boiler temperature setpoint is maintained (only for systems without a buffer tank).

4.2.3 Water - Times

System menu Water

➲ "Setting times" [▸ 105]

4.2.4 Water - Service

System menu Water

Residual heat use

Prerequisite: Hydraulic system 0 and return temperature control with mixing valve

YES: Diverts the residual heat to the DHW tank. The "Minimum boiler temperature to release all pumps" parameter is then ignored. The pump is set to minimum speed until the boiler temperature is lower than the DHW tank temperature + 3°C.

Only load DHW tank once a day

- **NO**: DHW loading is always triggered by the DHW tank temperature falling below the value that is set under „Reload if DHW tank temperature is below" and the time window is active and the heat source (boiler or buffer tank) indicates sufficient temperature.
- **YES**: If in the current day the DHW tank has already been loaded once, any further DHW tank loading is prevented.

Legionella heating activated

- **NO**: A legionella heating of the DHW tank is not carried out.
- **YES**: Once a week the DHW tank is heated to the temperature set under the parameter “DHW tank temp. setpoint for legionella heating (same for all DHW tanks)”.

When should the legionella heating be carried out

Determines the day of the week on which the legionella heating of the domestic hot water is carried out.

DHW tank temp. setpoint for legionella heating (same for all DHW tanks)

If the parameter “Legionella heating activated” is set to “YES”, the DHW tank is heated to the set temperature on the specified day of the week.

Which buffer tank or heat distributor supplies the heat to this DHW tank (0 = boiler)

Prerequisite: Parameter can only be used in conjunction with multiple house systems (variants)

This parameter defines the allocation of the heat source for this DHW tank.

- **0** = Boiler
- **1** = Buffer tank 01, …

DHW tanks run-on ⇒ (this setting applies for all DHW tanks)

When DHW tank loading has finished, the DHW tank loading pumps continue to run for the time set here.

Sensor input of DHW tank 01 … 08 top sensor

Sensor input to which the DHW tank sensor is connected.

Sensor input of DHW tank 01 … 08 solar reference sensor

Sensor input to which the sensor for the DHW tank solar reference is connected.

Pump output of DHW tank 01 … 08 pump

Pump outlet to which the boiler loading pump is connected.

Control of DHW tank pump

Definition of control signal for pump type used.

➲ "Activation options of pump outlets" [▶ 95]

Minimum DHW tank speed

Adjustment of the minimum speed to the pump type (set mode of pump in accordance with pump manufacturer).

Maximum DHW tank pump speed

If for reasons of system operation you need to limit the maximum speed of the DHW tank loading pump you can do so by adjusting this parameter.

4.3 Solar

4.3.1 Solar - Status

System menu Solar

Collector temperature

Display of the current temperature at the solar collector.

Top storage tank solar sensor

Display of the current temperature at the solar reference sensor in the top part of the buffer tank.

Solar temperature buffer tank bottom

Display of the current temperature at the solar reference sensor in the lower part of the buffer tank.

Collector return temperature

Prerequisite: Hydraulic system 12 or 13

Display of the current temperature at the collector return.

Actual power from solar heat meter [kW]

Display of the current output which is generated by the solar collector. The calculation of the output is only performed either when a per litre output of the collector pump has been set or an external volume pulse transmitter is used. In order to perform the calculation more precisely, the use of a collector return sensor is recommended.

Flow through [l/h]

Prerequisite: External volume pulse transmitter installed

Display of the water quantity currently being pumped through the solar collector.

Todays yield [kWh]

Display of the heat quantity that has been supplied by the solar panel system today.

Daily yield 1 ... 6 days ago

Shows the historical progression of the solar panel system. The yields of the last 6 days are available.

Total yield [kWh]

Display of the heat quantity which has been supplied by the solar panel system since activation of the heat meter.

Total yield [MWh]

Display of the heat quantity which has been supplied by the solar panel system since activation of the heat meter.

DHW tank bottom temperature

Current temperature in the area of the reference sensor of the solar panel system.

Heat exchanger sec. return temperature (line to buffer tank)

Prerequisite: Hydraulic system 12 or 13

Current temperature at heat exchanger flow on the secondary side.

Collector pump runtime

Display of the total runtime of the collector pump.

Number of switch cycles of the isolating valve

Indicates the number of switch cycles of the solar isolating valve that switches between two heat sinks (e.g. upper and lower solar element).

Collector pump control

Display of the current speed of the collector pump as a percentage of maximum speed.

Pump between heat exchanger and DHW tank

Prerequisite: Hydraulic system 12

Display of the current speed of the pump between heat exchanger and DHW tank.

Diverter valve for top/bottom coils

Prerequisite: Hydraulic system 12 or 13

Current control of the isolating valve on the solar side.

- **0%** … bottom buffer tank
- **100%** … top buffer tank

Current control status of the collector – DHW tank pump

Prerequisite: Solar System 3 on the DHW tank and buffer tank

Indicates the current control status of the collector pump between the collector and DHW tank.

Current control status of the collector – buffer tank pump

Prerequisite: Solar System 3 on the DHW tank and buffer tank

Indicates the current control status of the collector pump between the collector and buffer tank.

Collector - buffer tank pump runtime

Prerequisite: Solar System 3 on the DHW tank and buffer tank

Specifies the operation hours of the pump between the collector and buffer tank.

Collector - DHW tank pump runtime

Prerequisite: Solar System 3 on the DHW tank and buffer tank

Specifies the operation hours of the pump between the collector and DHW tank.

Goal of solar loading

Indicates which heat sink (buffer tank, DHW tank) is currently being loaded.

4.3.2 Solar - Temperatures

System menu Solar

Boiler target temperature during solar charging

Up to this temperature the DHW tank is heated by the solar system. If the solar panel system is equipped with an isolating valve for switching between DHW tank and buffer solar coil, then this parameter is responsible for switching between both of these solar coils.

Temp differential to start collector pump

The collector pump activates when the collector temperature exceeds the reference temperature in the DHW tank or buffer tank by this value.

Temp difference to stop collector pump

The collector pump switches off when the difference between the collector temperature and reference temperature in the DHW tank or buffer tank is lower than this value.

Maximum buffer tank bottom temperature during solar charging

Prerequisite: Hydraulic system 12 or 13

If the sensor for the solar reference temperature in the buffer tank exceeds the specified value, the collector pump is switched off.

Minimum collector temperature

Minimum temperature at collector which must be reached in order for the solar control to start.

Collector/pump protection from a collector temp.

If the measured value of the solar collector sensor exceeds the set value, the solar collector must cool down by 20°C within 15 minutes, otherwise the solar collector pump stops in order to protect the pump.

Heat exchanger - buffer tank pump start delay

Prerequisite: Hydraulic system 12 or 13

Delay for switching on the pump between heat exchanger and buffer tank.

Heat exchanger – buffer tank pump stop delay

Prerequisite: Hydraulic system 12 or 13

Delay for switching off the pump between heat exchanger and buffer tank.

Buffer tank top solar setpoint (fast loading until this temperature)

Prerequisite: Hydraulic system 12 or 13

When the upper sensor in the buffer tank reaches the specified value, the solar isolating valve switches to the lower area of the buffer tank.

Collector - buffer tank top differential

Prerequisite: Hydraulic system 12 or 13

This is the overcharge for the collector pump controller for the top or bottom temperature in the buffer tank.

Top buffer tank – secondary HE flow difference

Prerequisite: Hydraulic system 12 or 13

This parameter indicates how much lower the temperature at the heat exchanger secondary outfeed is than the collector temperature should be. If the difference is less than the set value, the speed of the pump between heat exchanger, DHW tank and buffer tank is reduced.

4.3.3 Solar - Times

System menu Solar

The solar panel system pump is allowed to start from

If the criteria for starting the collector pump have been reached after the set time, the collector pump starts.

The solar panel system pump is allowed to run until

Also when the criteria for starting the collector pump have been reached, the collector pump is only active up to the set time.

4.3.4 Solar - Service

System menu → Solar

Solar system

- **1**: The solar panel system supplies only the DHW tank
- **2**: The solar panel system supplies only the buffer tank
- **3**: The solar panel system is expanded with a switch valve and is used to supply two different heat sinks. For example: Switch from domestic hot water tank to buffer tank, or between top and bottom solar coils with the hygienic solar layered tank or modular solar layered tank with 2 solar coils)

NOTICE! This parameter is not displayed when hydraulic system 12 or 13 is set.

Pump output of collector pump

Pump outlet to which the collector pump is connected.

Control of the collector pump

Definition of control signal for pump type used.

➲ "Activation options of pump outlets" [▶ 95]

Minimum collector pump speed

Adjustment of the minimum speed to the pump type (set mode of pump in accordance with pump manufacturer).

Maximum collector pump speed

If for systemic reasons you need to limit the maximum speed of the collector pump you can do so by adjusting this parameter.

Collector monitoring

- **YES:** The collector pump is switched on at regular intervals for 10 seconds. The time can be defined using the following parameter. If the collector sensor detects an increase in temperature, the pump remains activated continuously. This function is active from 8:00 am - 7:00 pm and the threshold value of the collector temperature, from which this function is active, is dynamically adjusted.
- **NO:** The collector pump starts only when the criterion which is defined under parameter "Temp differential to start collector pump" is reached.

Collector monitoring every

If the collector pump is not active within the time window between 8:00 am – 7:00 pm, the pump is activated for 10 seconds at the end of the specified time set. If the collector sensor detects an increase in temperature, the pump remains activated continuously. If no temperature increase on the collector sensor is detected, the collector pump switches off and the time restarts from zero.

DHW tank priority for solar loading

- **YES**: The DHW tank is loaded until the temperature set under „Set DHW temperature for solar charging" is reached.. Only then does it switch to the buffer tank by means of the switch valve.
- **NO**: The DHW tank is loaded until the temperature difference between the sensor on the solar collector and the solar reference sensor in DHW tank is no longer sufficient. The switch valve then switches to the buffer tank and supplies it for 20 minutes. Afterwards the collector pump is stopped for 20 minutes and a check is carried out to see if the temperature difference is now sufficient for DHW tank charging.

Solar charging to which buffer tank

This parameter defines the buffer tank to which the solar charging takes place.

Solar charging to which DHW tank

This parameter defines the DHW tank to which the solar charging takes place.

Sensor input of solar collector sensor

Sensor input to which the collector sensor is connected.

Sensor input of solar reference buffer tank top sensor

Prerequisite: Hydraulic system 12 or 13

Sensor input to which the solar reference sensor in the top part of the buffer tank is connected.

Sensor input of solar reference buffer tank bottom sensor

Sensor input to which the solar reference sensor in the lower part of the buffer tank is connected.

Sensor input of secondary HE sensor flow

Prerequisite: Hydraulic system 12 or 13

Sensor input to which the sensor at heat exchanger flow on the secondary side is connected.

Sensor input of the collector return sensor

Sensor input to which the sensor for the collector return is connected.

Pump output of the solar isolating valve

Pump outlet to which the solar isolating valve is connected.

Pump output of buffer tank – heat exchanger pump

Prerequisite: Hydraulic system 12 or 13

Pump outlet to which the pump between the solar heat exchanger and buffer tank is connected.

Control of buffer tank – heat exchanger pump

Prerequisite: Hydraulic system 12 or 13

Definition of control signal for pump type used.

➲ "Activation options of pump outlets" [▶ 95]

Pump outlet of DHW tank – heat exchanger pump

Prerequisite: Hydraulic system 12

Pump outlet to which the pump between the solar heat exchanger and DHW tank is connected.

Control of DHW tank – heat exchanger pump

Prerequisite: Hydraulic system 12

Definition of control signal for pump type used.

➲ "Activation options of pump outlets" [▶ 95]

Invert switch valve output

Prerequisite: Solar system 3, hydraulic system 12 or 13

- **NO**: The pump outlet to which the solar switch valve is connected is supplied with 230V if the solar panel system is supplying energy to the DHW tank solar element or the top part of the buffer tank. If there is not 230V at this output, the valve clears the way to the buffer tank solar element or the lower area of the buffer tank.
- **YES**: If the solar switch valve switches incorrectly, the way it is controlled can be adjusted using this parameter.

Is a PT1000 sensor used as a solar sensor?

- **NO**: A KTY81 sensor is used as a collector sensor
- **YES**: A PT1000 sensor is used as a collector sensor

Collector pump control Kp value

Control parameter for the speed control of the collector pump.

Collector pump control Tn value

Control parameter for the speed control of the collector pump.

Secondary HE pumps control Kp value

Prerequisite: Hydraulic system 12 or 13

Control parameter for the speed control of the pump between the solar heat exchanger and buffer tank, as well as for the pump between the solar heat exchanger and DHW tank (if installed).

Secondary HE pumps control Tn value

Prerequisite: Hydraulic system 12 or 13

Control parameter for the speed control of the pump between the solar heat exchanger and buffer tank, as well as for the pump between the solar heat exchanger and DHW tank (if installed).

Minimum pump speed secondary HE

Prerequisite: Hydraulic system 12 or 13

Adjustment of the minimum speed to the pump type (set mode of pump in accordance with pump manufacturer).

This parameter applies to the pump between the solar heat exchanger and the buffer tank, as well as to the pump between the solar heat exchanger and DHW tank (if installed).

Control of collector - DHW tank pump

Adjustable parameters for the control type of the pump between the collector and DHW tank.

Control of the collector - buffer tank pump

Adjustable parameters for the control type of the pump between the collector and buffer tank.

Pump output of the collector - DHW tank pump

Adjustable parameters for the initial configuration of the pump between the collector and DHW tank.

Pump output of the collector - buffer tank pump

Adjustable parameters for the initial configuration of the pump between the collector and buffer tank.

4.3.5 Solar - Heat meter

System menu → Solar

Collector temperature

Display of the current temperature at the solar collector.

Collector return temperature

Prerequisite: Hydraulic system 12 or 13

Display of the current temperature at the collector return.

Actual power from solar heat meter [kW]

Display of the current output which is generated by the solar collector. The calculation of the output is only performed either when a per litre output of the collector pump has been set or an external volume pulse transmitter is used. In order to perform the calculation more precisely, the use of a collector return sensor is recommended.

Flow through [l/h]

Prerequisite: External volume pulse transmitter installed

Display of the water quantity currently being pumped through the solar collector.

Todays yield [kWh]

Display of the heat quantity that has been supplied by the solar panel system today.

Daily yield 1 ... 6 days ago

Shows the historical progression of the solar panel system. The yields of the last 6 days are available.

Total yield [kWh]

Display of the heat quantity which has been supplied by the solar panel system since activation of the heat meter.

Nominal flow of collector pump for heat meter [L/h]

If no external volume pulse transmitter is used, the pump of the heat meter can be activated by entering the per litre output. The flow rate at 100% collector pump speed must be entered here.

NOTICE! This parameter can be ignored if using an external volume pulse transmitter!

Litres per pulse of flow through meter

If an external volume pulse transmitter is used, adjust this value according to the volume pulse transmitter used [0.5 – 5 pulses/L].

Sensor input of the collector return sensor

Sensor input to which the sensor for the collector return is connected.

Sensor input of heat meter flow temperature sensor

Sensor input to which the sensor for the heat meter flow temperature is connected.

Is an external flow meter used?

- **YES:** An external volume pulse transmitter is in use.

Total yield [MWh]

Display of the heat quantity which has been supplied by the solar panel system since activation of the heat meter.

Collector flow temperature

Indicates the temperature of the sensor in the flow to the collector. This can optionally be configured and is necessary for measuring heat quantity. Is no flow temperature sensor is configured, the collector temperature is used.

Heat exchanger sec. return temperature (line to buffer tank)

Prerequisite: System 12 or System 13

For solar systems with an external heat exchanger, the outlet temperature from the heat exchanger is recorded as a secondary measurement.

4.4 Buffer tank

4.4.1 Buffer tank - Status

System menu Buffer tank

Buffer tank top temperature

Display of the current temperature in the top part of the buffer tank.

Storage tank temperature sensor 2 … 7

Prerequisite: Multi-sensor management with 3 – 8 sensors

Displays the current temperature at the respective sensor position at the storage tank. All of the configured sensors are used to calculate the storage tank charge status.

Buffer tank middle temperature

Prerequisite: Middle buffer tank temperature sensor installed

Display of the current temperature in the mid area of the buffer tank.

Buffer tank bottom temperature

Display of the current temperature in the lower part of the buffer tank.

Buffer tank pump control

Display of the current speed of the buffer loading pump.

Storage tank charge

Display of the current storage tank charge.

4.4.2 Buffer tank - Temperatures

System menu → Buffer tank

Heating circuit release from following buffer tank temperature

Temperature value which must be reached to release the heating circuit pumps in the top part of the buffer tank.

NOTICE! This parameter applies for all available heating circuits!

Temperature difference between boiler and border layer

Prerequisite: Middle buffer tank temperature sensor installed and mid buffer controller active

The boiler controller attempts to maintain the boiler setpoint temperature minus the value set here, using the speed control of buffer loading pump.

Boiler start if there is a difference between the boiler temperature setpoint and the top buffer tank temperature

If the difference between the upper buffer tank temperature and the boiler temperature setpoint is greater than the specified value, the boiler starts.

Start of buffer tank charging from charge

Prerequisite: Master boiler in the cascade or hydraulic system 4

If the buffer tank charge is below the specified value, the boiler starts.

100% boiler control output when buffer charge is lower than

Prerequisite: Master boiler in the cascade or hydraulic system 4

If the buffer tank charge is below the specified value, the boiler system runs at nominal load.

0% boiler output if buffer charge is over

Prerequisite: Master boiler in the cascade or hydraulic system 4

If the buffer tank charge is greater than the specified value, the boiler system follows the shutdown procedure.

Storage tank charge is 100% at boiler setpoint parameter

Prerequisite: Master boiler in the cascade or hydraulic system 4

The buffer tank charge is 100% if the average temperature of the buffer tank is below the specified boiler temperature setpoint by the specified value. This parameter defines the end point of the charging curve of the buffer tank.

Buffer tank charge is 0% at the following temperature (absolute value)

Prerequisite: Master boiler in the cascade or hydraulic system 4

The buffer tank charge is 0% if the average temperature of the buffer tank reaches the specified value. This parameter defines the base point of the charging curve of the buffer tank.

Buffer tank fully loaded if temperature difference between boiler and bottom buffer tank

From this difference between the boiler temperature setpoint that has been set and the current temperature in the lower part of the buffer tank, buffer tank loading is stopped.

Storage tank – buffer tank difference

Prerequisite: Variant 3

Difference, which must be given for loading a buffer tank e.g. in an adjacent building. If this difference is not reached, the buffer tank loading stops.

4.4.3 Buffer tank - Times

➲ "Setting times" [▸ 105]

4.4.4 Buffer tank - Service

Enable heating circuit pump 0 according to top buffer temp

- **NO:** Enable heating circuit pump 0 according to the boiler temperature parameter „Minimum boiler temperature to release all pumps"
- **YES:** Enable heating circuit pump 0 according to the temperature in the upper part of the buffer tank parameter "`Heating circuit release from following buffer tank temperature`"Heating circuit release from following buffer tank temperature"

Sensor input of buffer tank top sensor

Sensor input to which the sensor in the top part of the buffer tank is connected.

Sensor input of buffer tank sensor 2-7

The number of sensors displayed depends on the configuration. All of the configured sensors are used to calculate the buffer tank charge status.

Sensor input of buffer tank middle sensor

Sensor input to which the sensor in the mid area of the buffer tank is connected.

Sensor input of buffer tank bottom sensor

Sensor input to which the sensor in the bottom part of the buffer tank is connected.

Pump output of buffer tank pump

Pump outlet to which the buffer loading pump is connected.

Control of buffer tank pump

Definition of control signal for pump type used.

➲ "Activation options of pump outlets" [▸ 95]

Minimum buffer tank pump speed

Adjustment of the minimum speed to the pump type (set mode of pump in accordance with pump manufacturer).

Maximum buffer tank pump speed

If for system operation reasons you need to limit the maximum speed of the buffer tank loading pump you can do so by adjusting this parameter.

If the boiler is active then charge all buffer tanks

Prerequisite: Variant 3 or variant 4

YES: Starting the boiler due to a heating requirement by the buffer tank in the boiler system loads not only this buffer tank, but all of the buffer tanks in sub-stations. This increases the runtime related to a boiler system start.

4.5 Boiler

4.5.1 Boiler - Status

System menu Boiler

Boiler temperature

Display of the current boiler temperature.

Flue gas temperature

Display of the current flue gas temperature. If a flue gas temperature sensor is not connected, the board temperature of the core modules is displayed.

Flue gas setpoint

Display of the calculated flue gas setpoint.

Boiler control variable

Display of the signal for the combustion controller.

ID fan control

Display of the current ID fan control.

Calculated boiler setpoint

Display of the current boiler temperature setpoint depending on the specified hydraulic system.

Calculated return setpoint

Prerequisite: Maintaining outfeed through return feed mixer

Specifies the calculated setpoint temperature for the return temperature control.

Return sensor

Prerequisite: Return temperature control with mixing valve or bypass pump

Display of the current temperature at the boiler return.

Remote switching using a room console

Specifies whether the boiler can be switched on and switched off using a room console.

Boiler status

Reports the current status of the boiler.

Return pump controller

Reports the current speed of the return lift pump (bypass pump) in percent.

4.5.2 Boiler - Temperatures

System menu Boiler

Boiler temperature setpoint

The boiler temperature is regulated to this temperature.

Turbomat setting range: 70-90°C

Shutdown if current boiler temperature is higher than boiler setpoint +

If the boiler temperature setpoint is exceeded by this value, the boiler follows the shutdown procedure. The boiler starts up again below the boiler temperature setpoint.

Always shutdown when boiler maximum setpoint is exceeded by +

If the maximum boiler temperature setpoint is exceeded by this value, the available heating circuit pumps and DHW tank loading pumps are also activated for cooling the boiler. If the current boiler temperature falls below the boiler temperature setpoint, the boiler starts up again.

Minimum boiler temperature to enable all pumps

When the current boiler temperature reaches this value, the buffer tank loading pump starts (hysteresis: 2°C).

Recommendation for PE1 Pellet and P4 Pellet: For systems with a storage tank, this value should be about 20°C below the specified boiler temperature setpoint (prevention of cold through flow!).

Minimum return temperature

Prerequisite: Return temperature control with mixing valve

Minimum temperature of return to the boiler.

Enable return mixer only with active storage tank pump

Prerequisite: “Variant 2 and 5” or “Variant 3”

Return mixer is controlled only when the store loading pump is active. If the pump stops, the mixer closes the total return / opens the bypass.

Return setpoint delay

Prerequisite: Maintaining outfeed through return feed mixer

Waiting time for calculating the return temperature setpoint adjustment. Once the specified time has passed, the heating system temperatures are evaluated.

Return setpoint boost (output influence)

Prerequisite: Maintaining outfeed through return feed mixer

This parameter determines how heavily the deviation of the actual boiler temperature from the boiler temperature setpoint is weighted.

Return feed min. difference at 100% output

Prerequisite: Maintaining outfeed through return feed mixer

Minimum difference between boiler temperature setpoint and return temperature setpoint. The temperature difference between the boiler outfeed temperature and boiler return temperature should not be below this value. This parameter is applicable when the boiler is at nominal load.

An interpolation is made between the two parameters between partial load and nominal load.

Heating circuit overheat invariable mode

Prerequisite: Variable mode activated or boiler system in the cascade

The boiler setpoint temperature in heating mode is increased by this value compared to the required flow temperature.

Use quick throttle function at RL temperature increase

- **YES:** Response to fast load change. If quick regulation is switched on, the return temperature is permanently monitored and if it increases unusually quickly (e.g. because a major consumer has dropped out), the feed is immediately reduced to the minimum setting so that the boiler does not overheat.

Temperature rise in return feed for quick regulation

The quick regulation responds to this temperature increase within the set monitoring time.

Monitoring time of temperature rise in return

Monitoring time of temperature rise in return (for start of quick regulation).

4.5.3 Boiler - Times

System menu Boiler

➲ "Setting times" [▸ 105]

4.5.4 Boiler - Service

System menu → Boiler

Variable mode activated

- **NO:** The boiler temperature is regulated to the boiler temperature setpoint that is set. When used in conjunction with a storage tank, this parameter should be set to “NO”.
- **YES:** The boiler temperature is regulated according to the calculated flow value for the heating circuit/DHW tank.

Mixer runtime

Prerequisite: Return temperature control with mixing valve

Setting the runtime of the mixer used for the return temperature control.

Recommendation: To reduce vibration of the mixer, do not set value to less than 150s!

Control of bypass pump

Indicates the control type of the RL lift pump.

Minimum speed of shunt pump

Indicates the minimum speed of the RL lift pump.

Individual evaluation of safety loop available

The safety loop (STB, STB2, water shortage, water pressure) can be directed to individual inputs, so that individual fault messages can be output.

4.5.5 Boiler - General settings

System menu → Boiler

Modem installed

- **NO:** The boiler does not have a modem for data transfer installed.
- **YES:** The boiler has a modem for data transfer installed.

Memory cycle of data logger

If the boiler is equipped with a data logger the most important boiler data is stored on a SD card. This parameter specifies at what intervals the recording should be started.

Output warnings through fault message relays

- **NO:** When there is an “error” or “alarm” the common fault relay closes.
- **YES:** In addition to an “error” or “alarm”, the common fault relay closes when a “warning” is present on the boiler.

Which temperature scale should be used

- **Celsius (°C):** Displayed temperature values and settings are shown in °C.
- **Fahrenheit (°F):** Displayed temperature values and settings are shown in °F.

Always log data in °C

- **YES:** In conjunction with a data logger, all temperature values are saved in °C.
- **NO:** In conjunction with a data logger, all temperature values are saved in °F.

Send a line break when ASCII data output on COM2

- **NO:** When a new data set is issued it will be added to the previous one.
- **YES:** A line break for better visualisation is sent between the individual data sets.

Reset counter since last maintenance to 0

- **NO:** The service hours counter since last maintenance continues to run.
- **YES:** The service hours counter since last maintenance is set to “0”.

Source for ext. power demand (0 - off, 1 - 0-10V, 2 - Modbus)

Defines whether the boiler is controlled via an external power demand. If “1 - 0-10V” or “2 - Modbus” is selected as the source, the boiler release and output can be controlled via an adjustable input at the analogue module (0-10V) or via the Modbus.
➲ "External power demand" [▸ 25]

Invert ext. power demand via analogue input

The purpose is to invert the input signal (0V = 0% ⇨ 0V = 100%).

Input external power demand

Current input value for the external power demand.

Current external power demand

Current effective specified value for the boiler taking the minimum times into consideration.

Adopt specified material values

YES: The preset boiler parameters for the chosen fuel selection are adopted. When the process is completed the parameter changes back to “NO”.

Adopt specified boiler values

YES: The preset boiler parameters for the selected boiler type are adopted. When the process is completed the parameter changes back to “NO”.

EEPROM reset

- **YES:** All boiler settings and system configurations are deleted! The boiler is only functional again once it has been recommissioned by Froling customer services or authorized installer!

Analogue module input for external power demand

Defines the input for the external power demand with a specified power of “0-10V“ (address of analogue module and input terminal, e.g. 0.3).

The system is filled with frost protection

YES: No error is triggered when the boiler falls to less than 2°C. The parameter has no effect on the other sensors.

Mode

Defines how the setpoint output of the boiler is established (for instance via and external output signal).

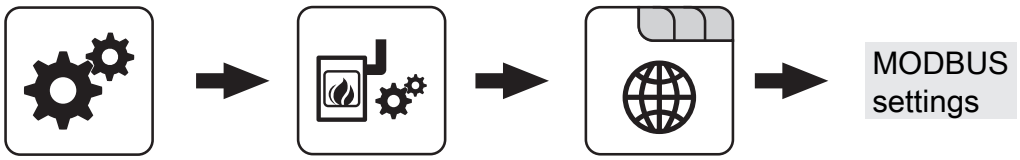
Cancel troubleshooting

The purpose is to cancel the status “Empty stoker“ for wood chip boilers. If this leads to a fault, there may possibly still be material that would normally be burnt remaining in the stoker. If the parameter is set to “YES” it is assumed that there is no longer any material in the stoker, and the fault rectification is thereby brought to an end.

Show info page QM wood processing plants

If this parameter is set to "YES", an extra page with information for "QM wood processing plants" is displayed in the info menu.

Boiler - General settings - MODBUS settings



System menu Boiler

COM 2 is used as a MODBUS interface

- **NO:** The COM 2 interface sends the most important boiler values every second.
- **YES:** The COM 2 interface can be used to connect a MODBUS (RTU/ASCII).

MODBUS address

Defines the address of the boiler in the Modbus network.

MODBUS protocol (1 – RTU / 2 – ASCII)

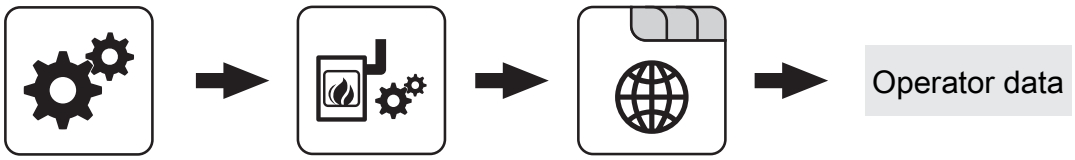
Indicates which Modbus protocol is to be used for the transfer. Which protocol must be used can be found in the documentation of the Modbus system used on site.

Use MODBUS protocol 2014?

Indicates whether the Modbus protocol 2014 is to be used for communication. In this version, parameters can be written at the customer level. In addition to the previous version, the element addresses are newly grouped thematically.

If the parameter is set to “NO”, the functionality and the element addresses remain the same as in the previous version to ensure compatibility with existing systems in the event of software updates.

Boiler - General settings - Operator data



System menu → Boiler

Production number

For unique identification of the boiler on the froeling-connect server, the facility number listed on the identification plate must be set here.

Customer number

By setting the customer number, this is automatically transferred into the commissioning report when it is saved.

Boiler number

By setting the boiler number, this is automatically transferred into the commissioning report when it is saved.

4.6 Boiler 2

4.6.1 Boiler 2 - Status

System menu → Boiler 2

Temperature of backup boiler

Displays the current boiler temperature of the backup boiler.

Burner relay status

Shows the current status of the burner relay:

- **0:** Backup boiler not active
- **1:** Backup boiler active

Backup boiler pump

Prerequisite: Set the parameter “Switch valve installed“ to “NO”

Display of the current pump control for the standby boiler.

Standby boiler switch valve

Prerequisite: Set the parameter “Switch valve installed“ to “YES”

Display of the current switch valve control of the standby boiler.

Manual start of backup boiler (only when the ID fan is switched off)

- **OFF:** Backup boiler is controlled according to the program that is set
- **ON:** Backup boiler is activated immediately

NOTICE! Response to burner blockage!

Heat pump mode

If a heat pump is used as a backup boiler, the operating mode will be displayed here. The operating mode selected is dependent on the outdoor temperature and flow temperature.

Heat pump status

Indicates the current status of the control process of the heat pump.

4.6.2 Boiler 2 - Temperatures

System menu → Boiler 2

Secondary boiler start delay

If there is a requirement from the heating circuit or DHW tank and the buffer tank or boiler has insufficient temperature, the secondary boiler starts after the specified delay time set here.

Disable startup delay in case of fault?

Indicates whether the startup delay is ignored in the event of a boiler fault and whether the standby boiler is activated immediately on request.

Deactivate startup delay when boiler is switched off?

Indicates whether the startup delay is ignored when the boiler is switched off and whether the standby boiler is activated immediately on request.

Backup boiler start, if buffer tank top temperature is below

If the temperature in the top part of the buffer tank falls below the specified value, the backup boiler is started once the set duration has elapsed.

Start standby boiler only according to storage tank top

Standby boiler enabled after temperature decreases below minimum temperature on top buffer tank. No consumers are taken into consideration.

Secondary boiler minimum runtime

If the secondary boiler is started, it will run for at least the length of time set here.

No heat pump operation when outside air temperature less than

Prerequisite: Heat pump as standby boiler

The heat pump stops working below the set temperature. This avoids operation with high energy consumption when the temperature outside is cold.

Maximum outfeed temperature for heat pump operation

Prerequisite: Heat pump as standby boiler

If a flow temperature higher than the set value is required, the main boiler takes over.

Main boiler minimum runtime

Prerequisite: Heat pump as standby boiler

If the main boiler is in operation, it only shuts down after the minimum runtime of the main boiler if the criteria for heat pump operation are fulfilled. This should prevent excessively short runtimes of the main boiler.

Minimum temperature of secondary boiler

When the secondary boiler reaches the specified temperature, the loading pump is started and switches the isolating valve.

Temperature difference between secondary boiler and buffer tank

Temperature difference between secondary boiler and upper temperature in layered tank to activate the loading pump of the secondary boiler.

Oil valve shut delay

If the current boiler temperature of the backup boiler falls to less than the value that is set under „Minimum temperature of backup boiler" the isolating valve does not trip until the set duration has elapsed.

Backup boiler delivery temperature

Prerequisite: Hydraulic system 3 in conjunction with a manually loaded backup boiler

If the backup boiler exceeds the specified temperature, the isolating valve switches and skims the boiler.

Main boiler startup delay

Prerequisite: Backup boiler is manually fed

Specifies the delay time after which the main boiler is permitted to start again.

Close delay for isolating valve

Specifies the delay time after the shutdown of the backup boiler. After the set time the valves switches back to the main boiler. This allows the backup boiler it has a certain period during which it can be warmed up after it was shut down.

4.6.3 Boiler 2 - Service

System menu → Boiler 2

Control backup boiler variably to the target value

- **NO:** The backup boiler is operated at the boiler temperature set by the backup boiler thermostat.
- **YES:** The boiler temperature of the backup boiler is regulated to the target temperature specified by the heating circuit or DHW tank.

Sensor input of backup boiler sensor

Sensor input to which the sensor for the backup boiler is connected.

Which pump output is used for unloading the backup boiler

Pump outlet to which the loading pump of the backup boiler or the backup boiler switch valve is connected.

Control of boiler 2 pump

Definition of control signal for pump type used.

➲ "Activation options of pump outlets" [▶ 95]

Maximum backup boiler 2 pump speed

If for system operation reasons you need to limit the maximum speed of the loading pump of the backup boiler you can do so by adjusting this parameter.

Invert the backup boiler isolating valve

YES: If the valve switches incorrectly, the way it is controlled can be adjusted using this parameter.

Burner relay

- **A:** Standby boiler is controlled according to the program that is set.
- **1:** Standby boiler was started manually.
- **0:** Backup boiler was stopped manually.

4.7 Fuel

4.7.1 Fuel - Parameter

System menu → Fuel

Fuel selection

- **Dry chip**
- **Wet chip**
- **Pellets**

After setting the fuel a prompt appears to adopt the specified material values. This must be confirmed with “YES”.

Delivery screw runtime

Defines the time that the delivery screw runs before it makes a pause.

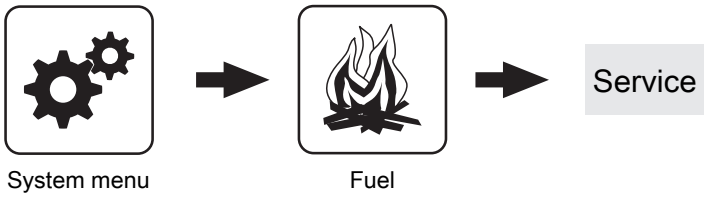
Suction fan run-on

The suction turbine runs on for the set time after the max sensor has tripped.

Delivery screw pause time

Defines how long the feed screw pauses after the runtime (parameter “Runtime for feed screw“) before the next runtime starts.

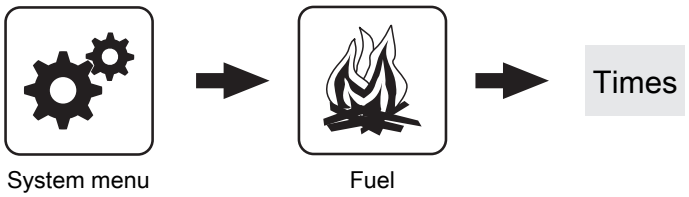
4.7.2 Fuel - Service



Manual filling of pellet container (only starts when gate valve is open)

- **ON:** The gate valve of the pellet container opens, the container is then filled with pellets until the switch point of the level sensor is reached. If the container is full the “`Pellet container level`” value is set to 100%.

4.7.3 Fuel - times



Start of 1st pellet filling

First start for a filling process. A filling process is only carried out if the fill level in the pellet container is below 85%.

Start of 2nd pellet filling

Second start for a filling process. This is likewise only carried out if the pellet container level is below 85%. If you only want one filling time, then set the second filling time to the same time as the first filling time.

Vacuum filling system permitted until

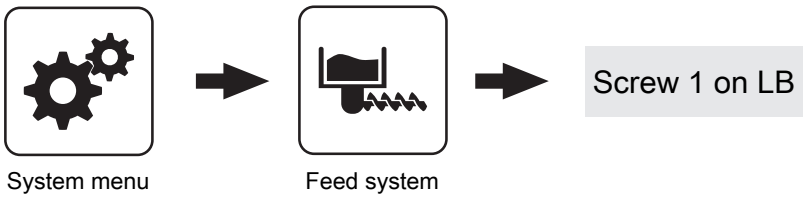
Defines the time until the vacuum discharge system may be activated.

Vacuum filling system permitted from

Defines the time from which the vacuum discharge system may be activated.

4.8 Feed system

4.8.1 Feed system - Screw 1 on LB



Screw active

- **NO:** Screw 1 on feed system module is not used.
- **YES:** Screw 1 on feed system module is used.
  - "Screw 1" output
  - "Drop box cover 1" input
  - "Light barrier 1" connection

Nominal current for screw 1 … 2

Nominal current for the motor of "screw 1 ... 2" motor according to the identification plate on the motor.

During troubleshooting of feed screw, it turns backwards for

Duration, how long should the feed screw turn backwards during troubleshooting.

During troubleshooting of feed screw, it turns forwards for

Duration, how long should the feed screw turn forwards during troubleshooting.

Switch-on delay feed screw light barrier

Feed screw startup delay. If no fuel is detected in the gravity shaft over the set time, the feed screw will start.

Switch-off delay feed screw light barrier

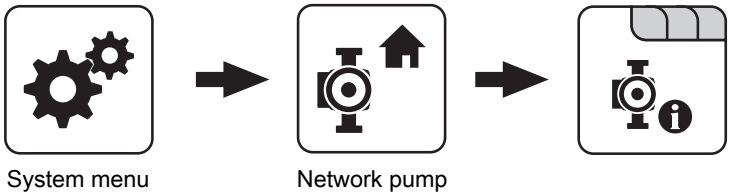
Feed screw switch-off delay. If no fuel is detected in the gravity shaft during the set time, the feed screw will stop.

Maximum idle time of screw

Time delay until an error in the material recognition is tripped.

4.9 Network pump

4.9.1 Network pump - Status



Network return temperature

Display of the current return temperature of the remote line.

Return temperature distributor 1

Prerequisite: Variant 1 and feeder pump for distributor 1 installed

Display of the current return temperature from distributor 1.

Speed, distributor 1 pump

Prerequisite: Variant 1 and pump for distributor 1 installed

Display of the current speed of distributor 1 pump.

Return temperature distributor 2 … 4

Prerequisite: Variant 2 or variant 3 and pump for distributor 2 ... 4 installed

Display of the current return temperature from distributor 2 ...4.

Speed, distributor 2 ...4 pump

Prerequisite: Variant 2 or variant 3 and pump for distributor 2 ... 4 installed

Display of the current speed of the distributor 2 … 4 pump.

4.9.2 Network pump - Temperatures

Network return setpoint

Prerequisite: Network pump installed

The network return setpoint is regulated to the value set here. When the network return temperature reaches the specified value, the network pumps starts up at minimum speed.

Return temperature setpoint distributor 1

Prerequisite: Variant 1 and pump for distributor 1 installed

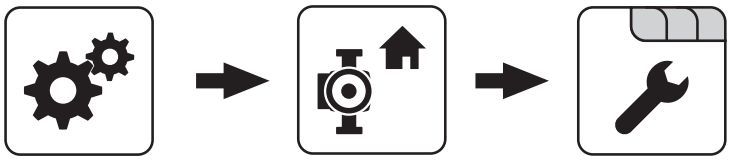
The return temperature from distributor 1 is regulated to the value set here. When the return temperature from distributor 1 reaches the specified value, the pump for distributor 1 starts up at minimum speed.

Return temperature setpoint distributor 2 ... 4

Prerequisite: Variant 2 or variant 3 and pump for distributor 2 ... 4 installed

The return temperature from distributor 2 ... 4 is regulated to the value set here. When the return temperature from distributor 2 reaches the specified value, the pump for distributor 2 ... 4 starts up at minimum speed.

4.9.3 Network pump - Service



Switch on the network pump only when required by the buffer tank (variant 3 / 4)

Prerequisite: Variant 3 or variant 4

- **NO**: The network pump is activated as soon as a consumer in the hydraulic system requires heat.
- **YES**: The network pump is only activated when one or more layered tanks require heat.

NOTICE! Parameter only relevant if a layered tank is installed in all buildings to be supplied!

Sensor input of network return temperature sensor

Sensor input to which the sensor for the network return temperature is connected.

Pump output of network pump

Pump outlet to which the network pump is connected.

Control of network pump

Definition of control signal for pump type used.

➲ "Activation options of pump outlets" [▶ 95]

Minimum speed of the network pump

Adjustment of the minimum speed to the pump type (set mode of pump in accordance with pump manufacturer).

Maximum speed of the network pump

If for system operation reasons you need to limit the maximum speed for the network pump you can do so by adjusting this parameter.

Sensor input of distributor 1 return sensor

Prerequisite: Variant 1 and pump for distributor 1 installed

Sensor input to which the sensor for the return distributor 1 is connected.

Pump output of distributor 1 pump

Prerequisite: Variant 1 and pump for distributor 1 installed

Pump outlet to which the pump for distributor 1 is connected.

Control of distributor 1 pump

Prerequisite: Variant 1 and pump for distributor 1 installed

Definition of control signal for pump type used.

➲ "Activation options of pump outlets" [▶ 95]

Minimum speed for distributor 1 pump

Prerequisite: Variant 1 and pump for distributor 1 installed

Adjustment of the minimum speed to the pump type (set mode of pump in accordance with pump manufacturer).

Maximum speed for distributor 1 pump

Prerequisite: Variant 1 and pump for distributor 1 installed

If for system operation reasons you need to limit the maximum speed of the distributor 1 pump you can do so by adjusting this parameter.

Sensor input of distributor 2 ... 4 return sensor

Prerequisite: Variant 2 or variant 3 and pump for distributor 2 ... 4 installed

Sensor input to which the sensor for the distributor 2 ... 4 return is connected.

Pump outlet of distributor 2 ... 4 pump

Prerequisite: Variant 2 or variant 3 and pump for distributor 2 ... 4 installed

Pump outlet to which the pump for distributor 2 ... 4 is connected.

Activation of distributor 2 ... 4 pump

Prerequisite: Variant 2 or variant 3 and pump for distributor 2 ... 4 installed

Definition of control signal for pump type used.

➲ "Activation options of pump outlets" [▶ 95]

Minimum speed for distributor 2 ... 4 pump

Prerequisite: Variant 2 or variant 3 and pump for distributor 2 ... 4 installed

Adjustment of the minimum speed to the pump type (set mode of pump in accordance with pump manufacturer).

Maximum speed for distributor 2 ... 4 pump

Prerequisite: Variant 2 or variant 3 and pump for distributor 2 ... 4 installed

If for system operation reasons you need to limit the maximum speed of distributors 2 ... 4 pump you can do so by adjusting this parameter.

4.10 Cascade

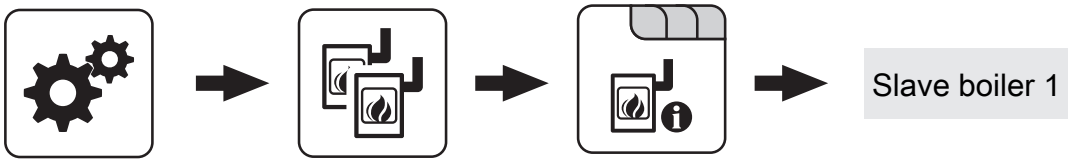
4.10.1 Cascade - Status

System menu → Cascade

Buffer tank charge

Display of the current buffer tank charge.

Cascade - Backup boiler



System menu → Cascade

Slave boiler boiler temperature

Display of the current boiler temperature of the backup boiler.

Slave boiler OK

Display of whether the backup boiler is ready for operation.

Backup boiler is heating

Display of whether the backup boiler is in “Heating” operating status.

Slave boiler control variable

Display of the signal for the combustion controller.

Boiler charging pump speed

Display of the current speed of the boiler loading pump.

Backup boiler flue gas temperature

Displays the current flue gas temperature at the backup boiler. If a flue gas temperature sensor is not connected, the board temperature of the core modules is displayed.

Backup boiler packet age

Specifies when the last data package was sent from the backup boiler (slave) to the main boiler (master).

Backup boiler return sensor

Prerequisite: Backup boiler with return temperature control by means of mixing valve or bypass pump.

Displays the current temperature of the boiler return for the backup boiler.

4.10.2 Cascade - Temperatures

Storage tank charge is 100% at boiler setpoint parameter

The buffer tank charge is 100% if the average temperature of the buffer tank is below the specified boiler temperature setpoint by the specified value. This parameter defines the end point of the charging curve of the buffer tank.

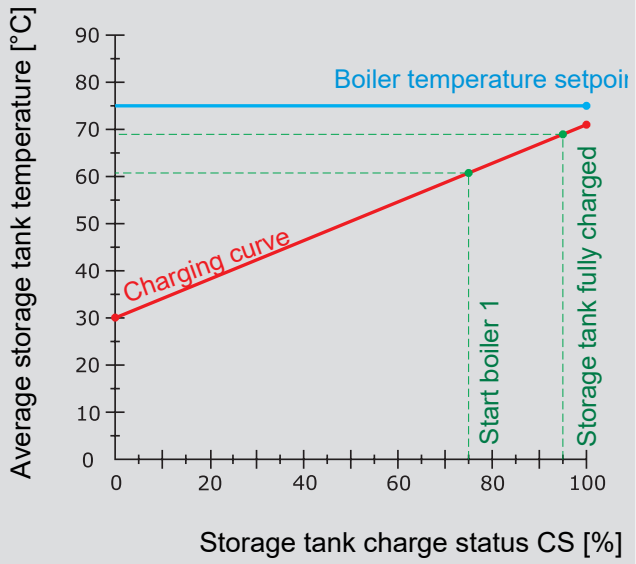
Buffer tank charge is 0% at the following temperature (absolute value)

The buffer tank charge is 0% if the average temperature of the buffer tank reaches the specified value. This parameter defines the base point of the charging curve of the buffer tank.

Start point 1 at storage tank charge

If the storage tank charge is lower than this value, the first boiler is started. This can be the boiler with the highest priority or with the fewest operating hours, and consequently both the master and the slave boiler.

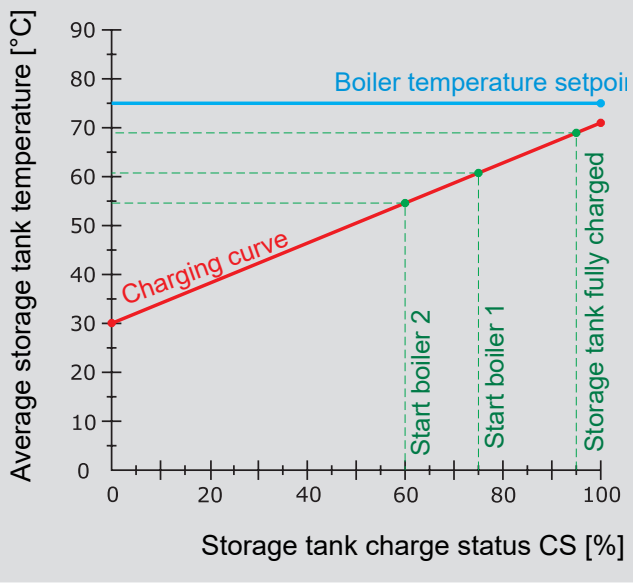
Start point 1 at storage tank charge



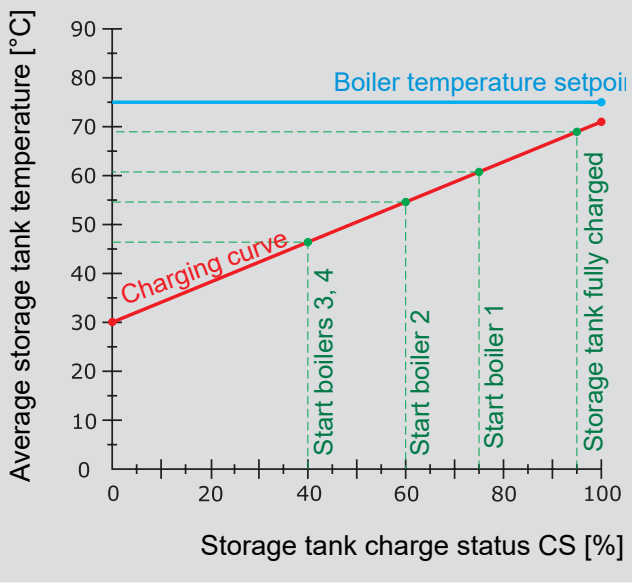
Start point 2 at storage tank charge

If the storage tank charge is lower than this value, the second boiler is started.

Start point 2 at storage tank charge



Start point 3 at storage tank charge



Start point 3 at storage tank charge

If the storage tank charge is lower than this value, slave boilers 3 and 4 are started.

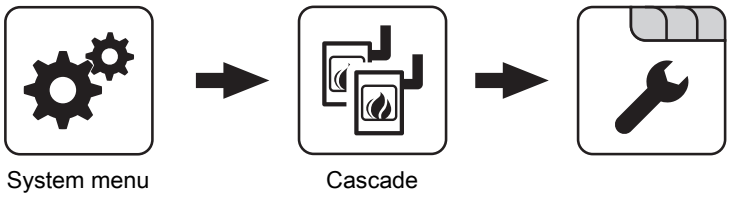
Quick start if buffer tank discharge is greater than (% / 10min)]

If the storage tank discharge is greater than the set value within 10 minutes, the boiler with the greatest rated heat output will be started (quick start).

Reduce the overall output of the cascade before the storage tank is fully charged

When the storage tank charge exceeds the value which is set under “Start point 1 at storage tank charge”, the boiler control variable for the boilers that are still active will be reduced using the boiler loading pump.

4.10.3 Cascade - Service



Boiler priorities are used to specify the sequence in which the boilers start. Where boilers have the same priority, the boiler currently with the fewest operating hours always starts first.

With this setting the master boiler always starts first as it has the **highest priority**; the boilers then start in numerical order.

Start priority of the master boiler	**1**
Start priority of slave boiler 1	**2**
Start priority of slave boiler 2	**3**
Start priority of slave boiler 3	**4**

With this setting the current **number of operating hours** is used as the start criterion as all boilers have equal priority.

Start priority of the master boiler	**1**
Start priority of slave boiler 1	**1**
Start priority of slave boiler 2	**1**
Start priority of slave boiler 3	**1**

Sensor input of the top sensor switch

NOTICE! This is displayed only for the master boiler and hydraulic system 0 or variant 1.

Specifies the input of the top sensor switch to which the connection is made.

Sensor input of the bottom sensor switch

Specifies the input of the bottom sensor switch to which the connection is made.

Hysteresis for regulating range

NOTICE! Only for boilers that have no storage tank.

The parameter relates to the actual temperature of the cascade (average of all boilers that are currently active).

- **State “Cold start”:** As long as the current temperature of the cascade is lower than the setpoint temperature less the hysteresis value for the control range, further boilers will be started after a delay. As long as the current temperature of the cascade is higher than the setpoint temperature less the hysteresis value for the control range, the system switches to the “control range” status.
- **Status “Control range”:** The boilers that were started will run. As long as the current temperature of the cascade is lower than the setpoint temperature less the hysteresis value for the control range, the system switches to the “cold start” status. As long as the current temperature of the cascade is higher than the setpoint temperature plus the hysteresis value for the control range, the system switches to the “shutdown” status.
- **Status “Shutdown”:** After a delay, each boiler will be shut down in succession. As long as the current temperature of the cascade is lower than the setpoint temperature plus the hysteresis value for the control range, the system switches to the “control range” status. As long as the current temperature of the cascade is higher than the setpoint temperature plus the hysteresis value for the control range and the hysteresis value for the quick output reduction, the system switches to the “quick shutdown” status.
- **Quick shutdown status:** After a delay, each boiler will be shut down in succession. As long as the current temperature of the cascade is lower than the setpoint temperature plus the hysteresis value for the control range and the hysteresis value for the quick output reduction, the system switches to the “shutdown” status.

During a cascade, if boilers 3 and 4 have no storage tanks they cannot be modulated and they are run at an elevated boiler setpoint temperature (the setpoint temperature of the cascade plus the hysteresis value for the control range and the hysteresis value for the quick output reduction.

Hysteresis for quick output reduction

NOTICE! Only for boilers that have no storage tank.

The parameter relates to the actual temperature of the cascade (average of all boilers that are currently active).

- **State “Cold start”:** As long as the current temperature of the cascade is lower than the setpoint temperature less the hysteresis value for the control range, further boilers will be started after a delay. As long as the current temperature of the cascade is higher than the setpoint temperature less the hysteresis value for the control range, the system switches to the “control range” status.
- **Status “Control range”:** The boilers that were started will run. As long as the current temperature of the cascade is lower than the setpoint temperature less the hysteresis value for the control range, the system switches to the “cold start” status. As long as the current temperature of the cascade is higher than the setpoint temperature plus the hysteresis value for the control range, the system switches to the “shutdown” status.
- **Status “Shutdown”:** After a delay, each boiler will be shut down in succession. As long as the current temperature of the cascade is lower than the setpoint temperature plus the hysteresis value for the control range, the system switches to the “control range” status. As long as the current temperature of the cascade is higher than the setpoint temperature plus the hysteresis value for the control range and the hysteresis value for the quick output reduction, the system switches to the “quick shutdown” status.
- **Quick shutdown status:** After a delay, each boiler will be shut down in succession. As long as the current temperature of the cascade is lower than the setpoint temperature plus the hysteresis value for the control range and the hysteresis value for the quick output reduction, the system switches to the “shutdown” status.

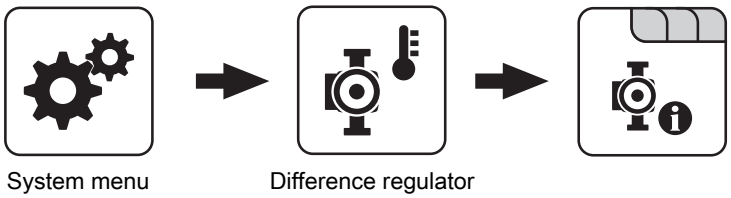
During a cascade, if boilers 3 and 4 have no storage tanks they cannot be modulated and they are run at an elevated boiler setpoint temperature (the setpoint temperature of the cascade plus the hysteresis value for the control range and the hysteresis value for the quick output reduction.

Delay for the request of the boiler from a flue gas min. temp

For a cascade that has no storage tanks, the request for a further boiler / switching off a boiler is subject to a delay.

4.11 Difference regulator

4.11.1 Difference regulator - Status



Heat source temperature

Display of the current heat source temperature of the differential controller (e.g. tiled stove with water pocket, …).

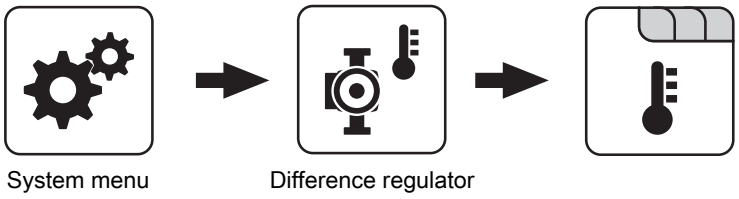
Heat sink sensor

Display of the current temperature of the heat sink for the differential controller (e.g. layered tank, etc.).

Pump speed

Specifies the current speed of the differential controller pump.

4.11.2 Difference regulator - Temperatures



Startup differential

Temperature difference between heat source and heat sink which must be reached to activate the pump of the differential controller.

Shutdown differential

If the temperature difference between the heat source and the heat sink falls below this value, the pump of the differential controller is deactivated.

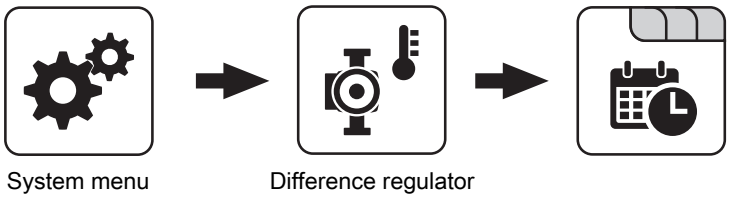
Minimum temperature for heat source

If the temperature in the heat source falls below this value the differential controller will be deactivated.

Maximum temperature for heat sink

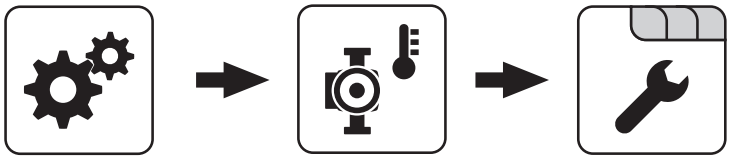
When the heat sink reaches this value, the pump of the differential controller is deactivated.

4.11.3 Difference regulator - Times



➲ "Setting times" [▶ 105]

4.11.4 Difference regulator - Service



System menu Difference regulator

Pump output of diff. control pump

Pump outlet to which the pump of the differential controller is connected.

Control of diff. control pump

Definition of control signal for pump type used.

➲ "Activation options of pump outlets" [▶ 95]

Minimum pump speed

Adjustment of the minimum speed to the pump type (set mode of pump in accordance with pump manufacturer).

Maximum pump speed

If for system operation reasons you need to limit the maximum speed of the pump of the differential controller you can do so by adjusting this parameter.

Sensor input of heat source sensor

Sensor input to which the heat source sensor is connected.

Sensor input of heat sink sensor

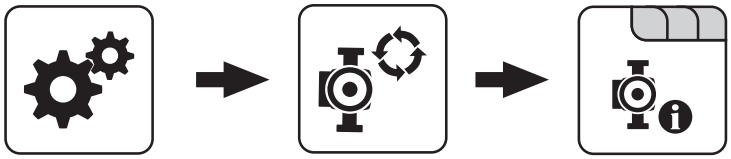
Sensor input to which the heat sink sensor is connected.

Sensor monitoring

- **YES:** If temperatures around freezing point occur, an error message appears on the display.
- **NO:** The error messages of the differential controller sensor are suppressed.

4.12 Circulation pump

4.12.1 Circulation pump - Status



System menu Circ. Pump

Return temperature in circulation line

Display of the current temperature at the return feed sensor of the circulation line.

NOTICE! If the parameter “Return sensor present” is set to “NO”, 0°C is permanently displayed.

Flow switch on the domestic hot water line

- **0:** Flow switch detects no flow
- **1:** Flow switch detects flow

If the flow sensor is implemented as a push-button:

- **0:** The button is not pressed
- **1:** The button is pressed

Speed of the circulation pump

Specifies the current speed of the circulation pump.

4.12.2 Circulation pump - Temperatures

System menu Circ. Pump

If the return sensor is present

- **NO:** The circulation pump is controlled according to time program. In conjunction with the use of a flow valve, the circulation pump is also activated at a signal from the flow valve.
- **YES:** The circulation pump is controlled according to time program and temperature at the return circulation line. In conjunction with the use of a flow switch, the circulation pump is also activated at a signal from the flow switch.

NOTICE! Connect the flow sensor as the return sensor!

The return temperature in the circulation pipe at which the pump is switched off

When the set temperature at the return circulation line is reached, the circulation pump is deactivated (3° hysteresis).

NOTICE! Parameter only relevant when using a return feed sensor in the circulation line!

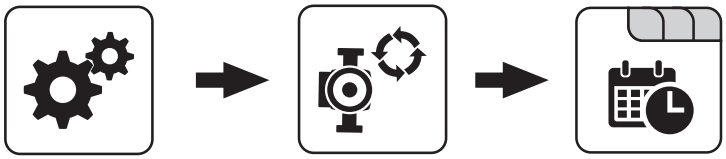
Circulation pump run-on

If the flow stops at the flow switch, the circulation pump still remains active for the time set.

If the flow switch is implemented as a push button, after the button is pressed the circulation pump still continues to run for the specified time.

NOTICE! Parameter only relevant when using a flow switch!

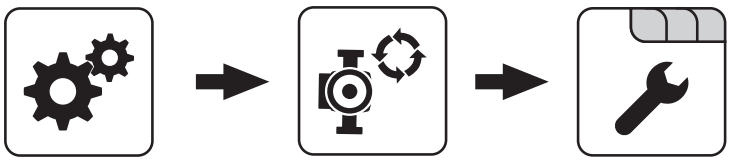
4.12.3 Circulation pump - Times



System menu Circ. Pump

➲ "Setting times" [▶ 105]

4.12.4 Circulation pump - Service



System menu Circ. Pump

Sensor input of circulation return sensor

Sensor input to which the sensor at the return line of the circulation is connected.

Which sensor is used for the flow switch

Sensor input to which the flow switch is connected.

If the flow switch is implemented as a push button, connect the external button directly to the sensor input.

Pump output of circulation pump

Pump outlet to which the circulation pump is connected.

Control of circulation pump

Definition of control signal for pump type used.

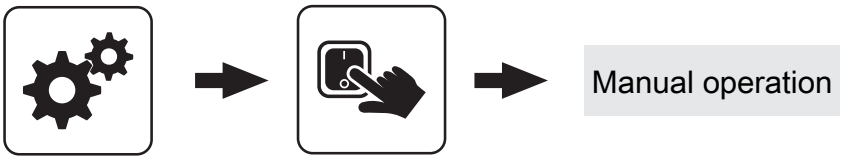
➲ "Activation options of pump outlets" [▶ 95]

Maximum speed of the circulation pump

If for system operation reasons you need to limit the maximum speed of the circulation pump you can do so by adjusting this parameter.

4.13 Manual

4.13.1 Manual - Manual operation



When exiting the “Manual operation” menu, all active parameters are automatically set to “OFF”! The parameters displayed depend on the boiler configuration!

Stoker ON

- **ON:** The stoker screw drive is activated.

Feed screw ON

- **ON:** The feed screw drive is activated.

Suction screw of cyclone 1 … 2

- **ON:** The drive of the suction screw at cyclone 1 is activated.

Rotary valve ON

- **ON:** The drive of the rotary valve is activated.

Ignition

- **ON:** The hot air blower / ignition rod for igniting the fuel is activated.

Back burn flap drive

- **ON:** Burn back flap is opened.

Oufeeder - manual

- **ON:** The stoker and feed screw drive is activated.

Ash screw

- **ON:** The ash screw drive is activated.

Manual filling of pellet container (only starts when gate valve is open)

- **ON:** The gate valve of the pellet container opens, the container is then filled with pellets until the switch point of the level sensor is reached. If the container is full the “`Pellet container level`” value is set to 100%.

Discharge screw

Suction screw for the active suction zone

If a 1-2-3 suction module is used, the suction screw for the suction zone that is currently active is manually controlled.

Induced draught fan

The induced draught fan can be actuated manually.

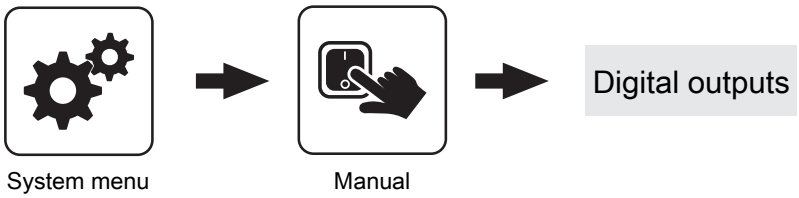
Switch off the induced draught fan whilst the boiler is off and whilst the door is open

The induced draught fan can be actuated manually.

WOS motor

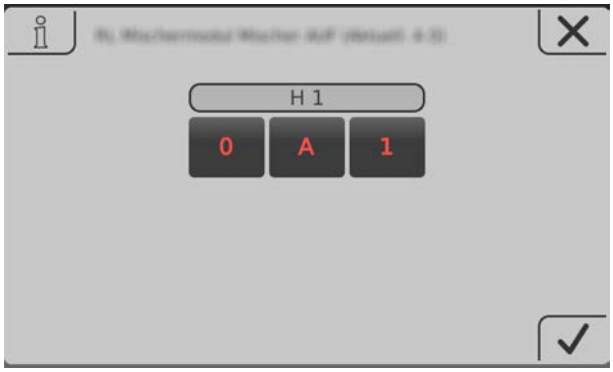
The WOS motor can be actuated manually.

4.13.2 Manual - Digital outputs

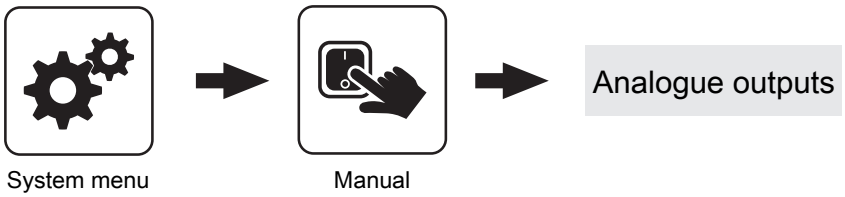


The parameters displayed depend on the boiler configuration!

- **A 0**: Automatic, Off; **A 1**: Automatic, On
- **1**: Manual, On
- **0**: Manual, Off

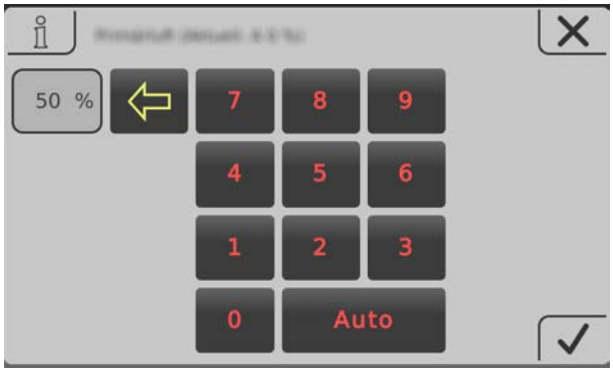


4.13.3 Manual - Analogue outputs

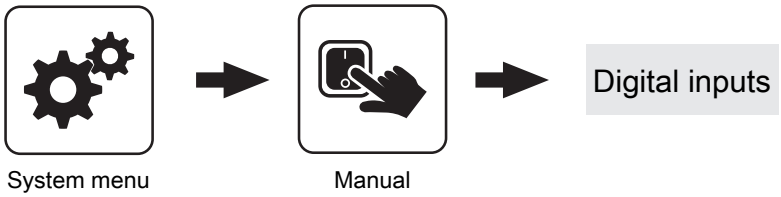


The parameters displayed depend on the boiler configuration!

- **A 0**: Automatic, Off; **A 1-100%**: Automatic, with % value ON
- **1-100%**: Manual, with % value ON
- **0%**: Manual, Off

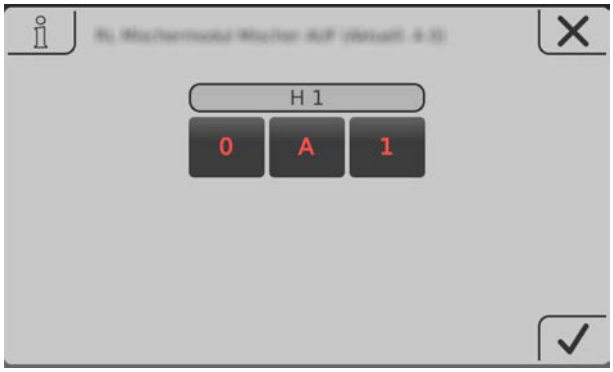


4.13.4 Manual - Digital inputs



The parameters displayed depend on the boiler configuration!

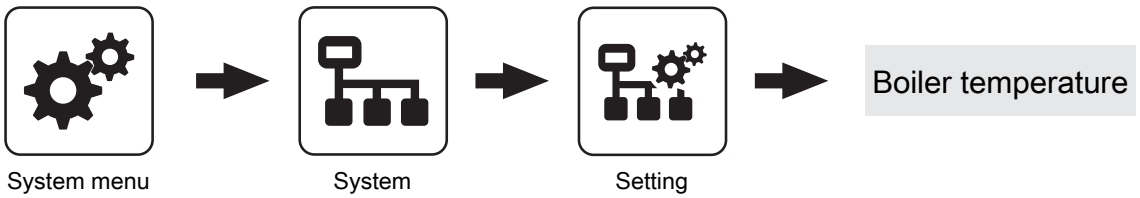
- **A 0**: Automatic, Off; **A 1**: Automatic, On
- **1**: Manual, On
- **0**: Manual, Off



4.14 System

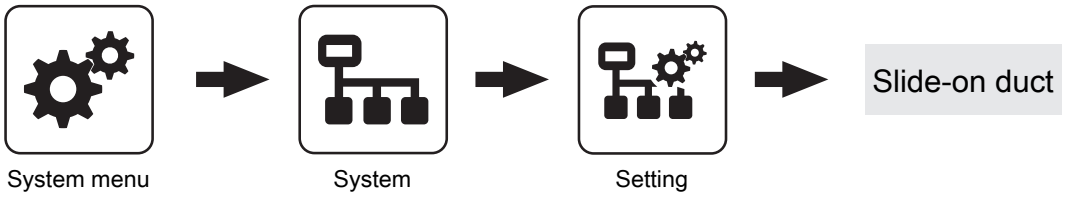
4.14.1 System - Setting

Setting - Boiler temperature



➲ "Boiler - Temperatures" [▶ 57]

Setting - Slide-on duct



Slide-on duct cooling installed
Specifies whether slide-on duct cooling is installed.

Slide-on duct cooling run-on
Specifies the run-on time of the pump control for the slide-on duct cooling.

Warning if temperature in slide-on duct above

If the actual temperature in the slide-on duct exceeds the set value, a warning message appears on the display.

Activate slide-on duct cooling if temperature above

If the actual temperature in the slide-on duct exceeds the set value, the pump starts to run at minimum speed to cool the slide-on duct.

Slide-on duct temperature sensor installed

Specifies whether a temperature sensor is present in the slide-on duct.

Slide-on duct cooling feedback type

Specifies how the feedback for the slide-on duct cooling is performed.

Control of the SoDC pump

Display of the current pump control for the slide-on duct cooling.

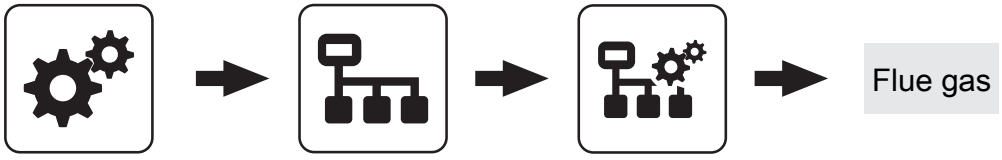
Pump output from SoDC pump

Specifies the pump output from the SoDC pump.

Slide-on duct temperature

Display of the current reference temperature for the cooling of the slide-on duct and burn through elbow. Start and stop values for the pump control refer to this temperature.

Setting - Flue gas



Minimum flue gas temperature

Lowest operation point of flue gas temperature for continuous operation.

Maximum flue gas temperature

Specifies the maximum flue gas temperature setpoint in °C.

NOTICE! When using the TI wood chip boiler, the upper range of the output decrease is calculated in conjunction with the predefined flue gas control band.

100% boiler output from a flue gas temperature of

Upper point of the start ramp of boiler controller. If the flue gas temperature reaches the value set here, the fuel output should reach 100%.

Minimum difference between flue gas temperature and boiler temperature in HEATING

As a condition for the “Heating” operating status, the difference between the current flue gas temperature and the current boiler temperature must at least exceed the value set here.

Safety time

If the condition “Minimum difference between flue gas and boiler temperature in HEATING” is not fulfilled for the set duration, the message “Safety time expired, flue gas temperature too low for too long” appears on the display.

Control range for the flue gas temperature

Defines the control band in °C before reaching the minimum or maximum flue gas temperature.

Ignition power at the flue gas temp.

Specifies the flue gas temperature that must be reached, so that power can be increased. Below this temperature the boiler is limited to the ignition power. Above this temperature the maximum possible power is calculated from the control curve (“ignition power at flue gas temperature” parameter -> "100% boiler power at flue gas temperature of” parameter). This should prevent the cold fire clay from heating up too quickly.

Duration of pre-heating

Time during which only the ignition is activated. The fuel slide-in is not active for this duration.

Infeed during ignition

Defined fuel feed-in for the “Ignition” status duration.

Maximum ignition duration

Specifies how long the ignition procedure should last. The “Heating” status must be reached within this time.

FGR

Release FGR flue gas temperature

Flue gas temperature at or above which the flue gas recirculation control system is activated. If the flue gas temperature falls to a level 3 °C below this value, then the FGR will be deactivated.

FGR power influence

Specifies as a percentage the influence that the current infeed level has on the FGR primary air. If this parameter is set to 100%, then the FGR primary air will adjust downwards proportionally to the feed level. If this parameter is set to 0%, then the FGR primary air is adjusted according to the combustion chamber signal and the calculated curve, and ignores the infeed level. At minimum output, this may result in the primary air being adjusted up to the maximum value. If the power influence is set to a negative value, this function is inverted. For negative values the FGR primary air is increased in proportion to the infeed rate.

Max. reduction of primary air in FGR mode

Specifies the amount by which the primary air (fresh air) can be reduced at maximum FGR primary air. Please note that the reduction is dependent on the infeed level and that the maximum reduction will not necessarily have been achieved at the point when the parameter "CCT signal for primary FGR stop" is reached. At full FGR primary air (= Maximum FGR Primary) and maximum feed level, the maximum reduction to the primary air will also be active.

CCT signal for primary FGR stop

Specifies the stop point for the FGR primary air as a percentage of the combustion chamber control band. The control range is defined by the parameters "0% CCT signal at CCT" and "100% CCT signal at CCT". Because the FGR primary air is also dependent on the instantaneous feed level, it is important that the FGR primary air flap is not yet at its maximum position when this point is reached or exceeded.

Primary FGR decrease curve

Specifies which curve will be used to control the FGR primary air from the stop point until the maximum combustion chamber temperature is reached.

CCT signal for primary FGR start

Specifies the start point for the FGR primary air as a percentage of the combustion chamber control band. The control range is defined by the parameters "0% CCT signal at CCT" and "100% CCT signal at CCT".

Prim. FGR increase curve

Specifies which curve will be used to control the FGR primary air from the start point (“CCT signal for primary FGR start” parameter) to the stop point (“CCT signal for primary FGR stop” parameter).

CCT signal for secondary FGR start

Specifies the start point for the FGR secondary air as a percentage of the combustion chamber control band. The control range is defined by the parameters "0% CCT signal at CCT" and "100% CCT signal at CCT".

CCT signal for secondary FGR stop

Specifies the stop point for the FGR secondary air as a percentage of the combustion chamber control band. The control range is defined by the parameters "0% CCT signal at CCT" and "100% CCT signal at CCT". At and above this point, the maximum possible FGR secondary air has been reached.

Max. reduction of secondary air through FGR

Specifies the maximum reduction to the secondary air when the stop point is reached (“CCT signal for secondary FGR stop” parameter). This ensures that the secondary air (= fresh air) is not closed off too much by the FGR.

FGR primary air opening at 0% control

Defines the minimum opening of the FGR primary air flap and guarantees a minimum proportion of primary air.

FGR primary air opening at 100% control

Defines the maximum opening of the FGR primary air flap and serves to limit the proportion of primary air.

FGR secondary air opening at 0% activation

Defines the minimum opening of the FGR secondary air flap and guarantees a minimum proportion of secondary air.

FGR secondary air opening at 100% control

Defines the maximum opening of the FGR secondary air flap and serves to limit the proportion of secondary air.

FGR cleaning duration

Specifies the duration for the automatic cleaning of the FGR duct in seconds.

FGR cleaning at CCT

Specifies the combustion chamber temperature, under which the cleaning of the FGR duct is released when the boiler is shut down.

Influence of FGR primary air on blower fan control

If the FGR fan is not regulated by underpressure, the FGR secondary air setpoint and the influence of the FGR secondary air on the fan activation is used to control the fan. If the calculated value is less than the value of the FGR primary air setpoint and influence of the FGR primary air on the fan activation, then the FGR primary air setpoint and influence der FGR primary air on the fan activation is used to control the fan.

Influence of FGR secondary air on the blower fan control

If the FGR fan is not regulated by underpressure, the FGR secondary air setpoint and the influence of the FGR secondary air on the fan activation is used to control the fan. If the calculated value is less than the value of the FGR primary air setpoint and influence of the FGR primary air on the fan activation, then the FGR primary air setpoint and influence der FGR primary air on the fan activation is used to control the fan.

Maximum control of the FGR primary air fan

Defines the limits for the activation of the FGR primary air fan.

Minimum control of the FGR primary air fan

Defines the limits for the activation of the FGR primary air fan.

Pressure setpoint in FGR duct

Specifies the pressure setpoint in the FGR duct.

FGR pressure control Kp

Achieves control of the FGR by pressure.

FGR pressure control Tn

Achieves control of the FGR by pressure.

FGR control according to

Specified whether the FGR is controlled by the combustion chamber temperature or by pressure within the FGR.

Delay until pressure too low warning

Specifies how long the pressure should remain below the permitted minimum pressure before a warning is triggered.

Minimum pressure in FGR duct

Specifies minimum pressure in the FGR duct. A warning is issued if the pressure falls below the this value.

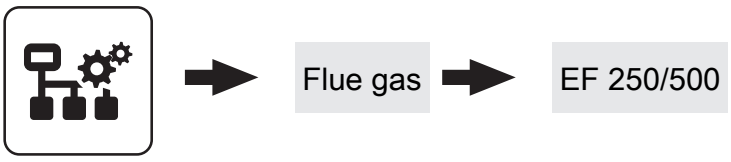
Air vane installed

Specifies whether the air vane is installed.

FGR pressure sensor cartridge measuring range

The characteristic curve of the FGR pressure sensor cartridge is selected.

EF 250/500



Setting

IO allocation

Address of digital module for electrostatic separator

Specifies the digital module address of the electrostatic separator for electrostatic separators with analogue setpoints.

Address of analogue module for electrostatic separator

Specifies the analogue module address of the electrostatic separator for electrostatic separators with analogue setpoints.

Service

Maximum setpoint for controlling HV module 1 ... 4

Determines the maximum output of the HV module up to which the voltage may be increased within a defined interval.

Flue gas temperature sensor for electrostatic separator installed?

Specifies whether a flue gas temperature sensor is present.

Enable electrostatic separation function

Used to activate/deactivate the electrostatic separator's function.

Max. output of HV modules

This is used to set the output power of the HV module in Watts. If two modules are used, the output of one module must be set here. If more than one module is used, HV modules with the same output power should always be used.

Startup criteria for HV modules - flue gas temperature

If the flue gas temperature of the boiler exceeds the set value, the HV modules are switched on. If the flue gas temperature falls below the set value during heating mode, the HV modules remain switched on.

Max. residual oxygen level at which the electrostatic separator may be active

If the measured residual oxygen exceeds the set value, the electronic separator is switched off (hysteresis 2%).

Max. number of flashovers in the start-up phase

If the set number of flashovers is detected after activation of the elec. separator, the ramp-up phase with increased control speed is completed and the system is controlled at the set speed.

Cleaning interval

Specifies after how many operation hours of the electrostatic separator a cleaning cycle must be started.

Duration of cleaning cycle

Defines the total time for a cleaning process. During this time the shaker is switched on.

Minimum target control for HV module(s)

Defines the output of the HV module up to which it can be reduced in the event of flashovers. If the controller detects a defined number of flashovers at the minimum setpoint control, the HV module switches to standby mode for a certain period of time.

Interval for voltage increase of the HV controller

If the controller does not detect a flashover within this set time, the voltage is increased by 1 percent.

Interval for voltage decrease of the HV controller

After a flashover, a voltage reduction is applied. Within the set interval, the voltage can only be reduced by 1 percent. If at least one flashover occurs again at the next interval, the voltage is reduced again by 1 percent.

Start value of the HV controller

Defines the starting point of the HV controller start ramp (parameter "Start ramp HV controller").

Status

Electrostatic separator flue gas temperature

If the electrostatic separator has no dedicated flue gas temperature, the boiler flue gas temperature is output.

Voltage return signal of the HV module 1 … 4

Reports the actual voltage of the HV module in kV.

Current return signal of the HV module 1 … 4

Reports the actual current of the HV module in mA.

Electrostatic separator status

Displays the current operating status of the electrostatic separator as a numeric code. The following statuses are possible:

- Status "0": Separator deactivated
- Status "1": Separator OFF
- Status "2": Separator ON
- Status "3": Measuring mode
- Status "4": RFI
- Status "5": Wait for bypass flap
- Status "6": Cleaning - Pause
- Status "7": Cleaning - Rinse
- Status "8": Wait for water sensor
- Status "9": Waiting for drying time
- Status "10": Separator error
- Status "11": Quick cleaning
- Status "12": Waiting for drying time
- Status "13": Cleaning – Waiting
- Status "14": Cleaning – Shaking
- Status "15": Cleaning – Waiting

Electrostatic separator return signal

Shows the status of the electrostatic separator as a numeric code. Following status values are possible:

- Status "0": No error
- Status "1": Power supply fault
- Status "2": RS485 error
- Status "3": Temperature box error
- Status "4": High voltage error
- Status "5": Wait for ready-to-measure state
- Status "6": Values critical
- Status "7": Measure
- Status "8": Measuring mode error

Time until next cleaning

Shows the remaining time (in minutes) until the next cleaning process.

Electrostatic separator operating hours

Shows the operation hours since the electrostatic separator was first activated.

Number of cleaning processes

Shows the total number of cleaning processes since the electrostatic separator was first activated.

Number of flashovers

Shows the total number of flashovers since the electrostatic separator was first activated.

Absorbed energy

Shows the total amount of absorbed energy since the electrostatic separator was first activated.

Output HV module 1 … 4

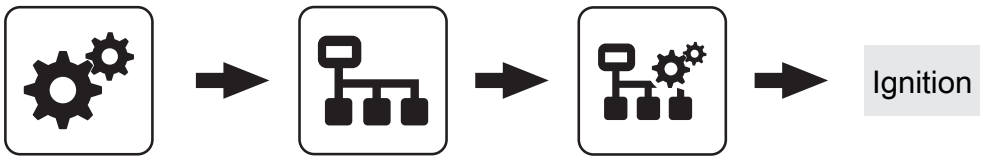
Actual output of the HV module in W.

Output level HV module 1 … 4

Displays the current output of the respective HV module as a numeric code. The following displays are possible:

- Output “0”: The current output of the HV module is between 0 - 25%
- Output “1”: The current output of the HV module is between 25 - 50%
- Output “2”: The current output of the HV module is between 50 - 75%
- Output “3”: The current output of the HV module is above 75%

Setting - Ignition



Feed time until there is a fuel quantity sufficient for ignition

Feed time until a sufficient quantity of fuel is present on the combustion grate to carry out the ignition process.

Duration of pre-heating

Time during which only the ignition is activated. The fuel slide-in is not active for this duration.

Maximum ignition duration

Specifies how long the ignition procedure should last. The “Heating” status must be reached within this time.

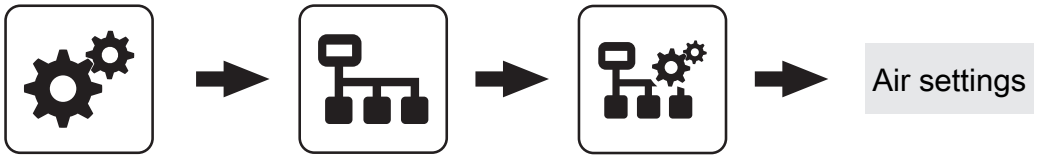
Infeed during ignition

Defined fuel feed-in for the “Ignition” status duration.

CCT rise for heating

If the combustion chamber temperature rises after pre-heating by this value, the boiler switches to “Heating“ operating status.

Setting - Air settings



Maximum ID fan control

Specifies the control voltage (0-10V) at which 100% ID fan control is emitted.

Primary air opening at minimum feed

Specifies the primary air flap position in percent at minimum power.

Secondary air opening at 0% signal

At 0% control of the secondary air flap, this will open by the specified value.

Secondary air opening at 100% control

At 100% control of the secondary air flap, this will open by the maximum specified value.

ID fan startup time

Corresponds to the minimum time of the boiler in “Preparation“ status.

Primary air when boiler off

Specifies the primary air flap opening in percent in “Boiler off” status.

Primary air boost for startup

Parameter for primary air increase at the start of heating. The primary air boost remains active for the entire heating up process and after changing to “Heating” status for the boost duration or until the minimum combustion chamber temperature is reached. After this time the primary air boost is reduced again.

Start secondary air cooling at CCT signal

Specifies the start point for secondary air cooling as a percentage of the combustion chamber temperature control band. The control range is defined by the parameters "0% CCT signal at CCT" and "100% CCT signal at CCT". For the start of cooling you should ensure that the secondary air does not begin at 0, but at the current (oxygen managed) secondary air setting.

End secondary air cooling at CCT signal

Specifies the end point for secondary air cooling as a percentage of the combustion chamber temperature control band. The control range is defined by the parameters "0% CCT signal at CCT" and "100% CCT signal at CCT". At this value the secondary air flap has reached the maximum permitted opening.

Start of output reduction at CCT signal

Description should also be changed in the SPS operating instructions:

Specifies the start point for power reduction as a percentage of the combustion chamber temperature control band. The control range is defined by the parameters "0% CCT signal at CCT" and "100% CCT signal at CCT". If the combustion chamber temperature signal exceeds this value, the fuel feed-in and the primary air are reduced. Both have the minimum value at 100% combustion chamber temperature signal.

Boiler underpressure setpoint

Desired underpressure which is to be maintained during the operation of the boiler.

Minimum underpressure

If this underpressure is not reached within a defined period of time, a warning is issued.

Time until error for MIN under-pressure in combustion chamber

If the specified underpressure is not reached after this time, a fault is issued.

Max. power reduction through under pressure control

Maximum power reduction when setpoint underpressure not reached.

Influence of primary air on the combustion air fan control

If the FGR fan is not regulated by underpressure, the FGR secondary air setpoint and the influence of the FGR secondary air on the CAF fan activation is used to control the CAF fan. If the calculated value is less than the value of the FGR primary air setpoint and influence of the FGR primary air on the CAF fan activation, then the FGR primary air setpoint and influence der FGR primary air on the CAF fan activation is used to control the fan.

Influence of secondary air on the combustion air fan control

If the FGR fan is not regulated by underpressure, the FGR secondary air setpoint and the influence of the FGR secondary air on the CAF fan activation is used to control the CAF fan. If the calculated value is less than the value of the FGR primary air setpoint and influence of the FGR primary air on the CAF fan activation, then the FGR primary air setpoint and influence der FGR primary air on the CAF fan activation is used to control the fan.

Air flap opening for the casing cooling

Specifies the primary air value in the “Casing cooling“ status.

Maximum control of the CAF

Maximum activation of the combustion air fan.

Tertiary air opening at 0% control

Defines the control range of the secondary air.

Tertiary air opening at 100% control

Defines the control range of the secondary air.

Black underpressure sensor cartridge installed (type: 401.93000)

Specifies whether a white underpressure sensor cartridge is installed.

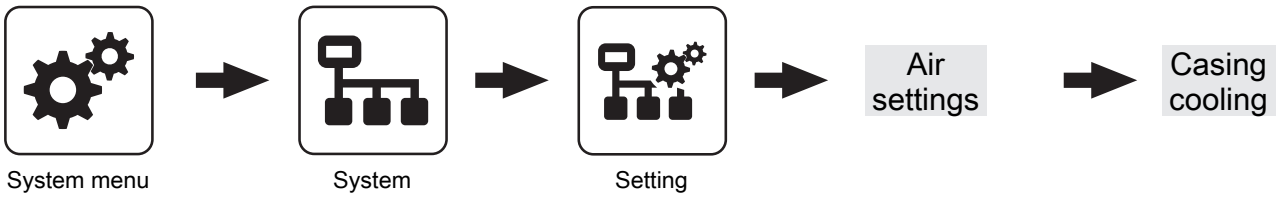
Minimum activation of the CAF

Specifies the minimum activation of the combustion air fan.

Minimum induced draught fan control at 0Pa combustion chamber underpressure

If due its the load change characteristics the PI regulator does not change quickly enough, a minimum activation of the ID fan is calculated.

Casing cooling



Use which air flap for casing cooling?

This parameter specifies which air flap is used to dissipate the heated case air.

Casing cooling installed

Specifies whether casing cooling is installed.

Start casing cooling at casing temperature

When the set combustion chamber temperature is reached, case cooling is enabled.

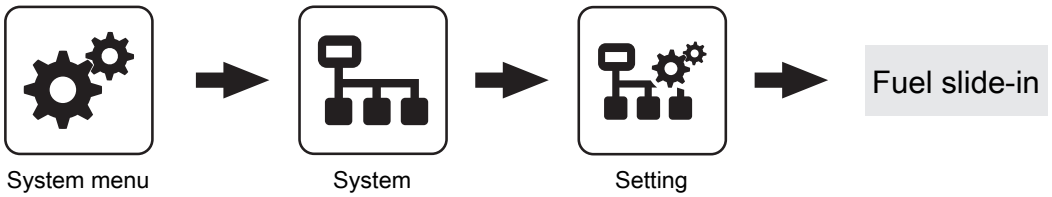
Stop casing cooling at casing temperature

If the temperature falls below this value, casing cooling is deactivated.

Casing cooling

Reports the actual temperature of the casing.

Setting - Fuel slide-in



Minimum output

Minimum infeed as a percentage of the maximum infeed (“maximum infeed” parameter). Lowest possible power.

Infeed during ignition

Defined fuel feed-in for the “Ignition” status duration.

Maximum infeed

Maximum loading rate of feed screw.

Feed time of feed screw is

The feed time in seconds, during which the feed screw is active after the pre-run time of the stoker screw.

Stoker pre-run

Time that the stoker runs before the feed screw is activated.

The time until the stoker is full is

Total time that the feed screw is on, until the fuel falls onto the grate (= stoker is full).

Rotary valve run-on

Prerequisite: Rotary valve with own drive installed

Defines the duration that the rotary valve continues to run after the feed screw has stopped.

Switch-on delay feed screw light barrier

Prerequisite: Level sensor installed between feed and stoker augers

The time for which the light barrier must consistently recognise material to activate material recognition in the drop box.

Switch-off delay feed screw light barrier

Prerequisite: Level sensor installed between feed and stoker augers

The time for which the light barrier must consistently recognise no material to deactivate material recognition in the drop box.

Switch-on delay of delivery screw(s) light barrier(s)

Prerequisite: Delivery screw installed or intermediate screw installed

The time for which the light barrier must consistently recognise material to activate material recognition in the delivery screw.

Switch-off delay of delivery screw(s) light barrier(s)

Prerequisite: Delivery screw installed or intermediate screw installed

The time for which the light barrier must consistently recognise no material to deactivate material recognition in the delivery screw.

Error of light barrier(s) is delayed for

Prerequisite: Overfilling safety device installed for rotary valve or level sensor installed between feed and stoker augers

Time delay until an error in the material recognition is tripped.

Counter limit for troubleshooting of rotary valve overcurrent is

Prerequisite: Rotary valve with own drive installed

Number of troubleshooting attempts on the rotary valve if the overcurrent sensor of the rotary valve activates.

During troubleshooting of stoker, it turns forwards for

Duration, how long should the stoker turn forwards during troubleshooting of stoker.

During troubleshooting of stoker, it turns backwards for

Duration, how long should the stoker turn backwards during troubleshooting of stoker.

During troubleshooting of feed screw, it turns forwards for

Duration, how long should the feed screw turn forwards during troubleshooting.

During troubleshooting of feed screw, it turns backwards for

Duration, how long should the feed screw turn backwards during troubleshooting.

During troubleshooting of rotary valve, it turns forwards for

Prerequisite: Rotary valve with own drive installed

Duration, how long should the rotary valve turn forwards during troubleshooting.

During troubleshooting of rotary valve, it turns backwards for

Prerequisite: Rotary valve with own drive installed

Duration, how long should the rotary valve turn backwards during troubleshooting.

A rotary valve motor protection switch error is delayed for

Prerequisite: Rotary valve with own drive installed

Time delay of an error message for the rotary valve motor protection switch.

The back-burn flap opens after a maximum of

Prerequisite: Back-burn flap installed

Maximum time the burn back flap has turned from the closed to the open position.

The back-burn flap closes after a maximum of

Prerequisite: Back-burn flap installed

Maximum time the burn back flap must be closed.

Nominal current for rotary valve

Prerequisite: Rotary valve with own drive installed

Setting the nominal current of the rotary valve according to the identification plate on the motor.

Start delay of light barrier at sliding floor

Prerequisite: Feed system, sliding floor available

If the light scanner does not detect any material within this time, the sliding floor is switched on.

Release delay of light barrier at sliding floor

Prerequisite: Feed system, sliding floor available

If the light scanner detects material within this time, the sliding floor is switched off.

Enforced cycle of sliding floor after

Prerequisite: Feed system, sliding floor available

If the transverse conveyor screw runs for this time without the sliding floor being requested, the sliding floor is activated for a set time (“Duration of enforced cycle of sliding floor” parameter).

Duration of enforced cycle of sliding floor after

Prerequisite: Feed system, sliding floor available

Specifies how long the sliding floor is activated for in override.

Maximum number of enforced cycles for sliding floor

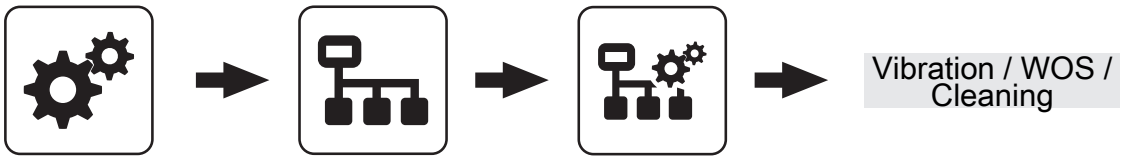
Prerequisite: Feed system, sliding floor available

Specifies how often the sliding floor can be activated in succession via the override.

Motor pause before reversal of the direction of rotation of the feed screw

At a change of direction, the screw is paused for the set time.

Setting - WOS / Cleaning



System menu → System → Setting

WOS start time

Time from which the heat exchanger cleaning system can be activated.

WOS stop time

Time to which the heat exchanger cleaning system can be activated.

WOS runs every

When the delivery screw runtimes reach the specified value, the WOS drive is activated.

WOS runtime

Time which the heat exchanger cleaning system is activated.

Minimum duration of blower fan run-on I (for residual O2)

Minimum duration of “FD fan run-on I” status. If the criterion “Current residual oxygen content“ ≥ ‟Residual oxygen content, above which fire is out‟ has already been fulfilled during this time, the operating status is not cancelled early. The maximum duration of the operating status is 1 hour.

Ash screw runtime

Time which the ash screw drive is activated.

If the ash screw is blocked, shut down after x hours of heating

If the controller detects a blockage of the ash screw it outputs a warning. After this the boiler will continue to heat for the set time before it is shut down.

Worm-drive grate control during heating

Specifies the activation of the crank-drive grate during heating. The parameter defined the percentage of the cycle time during which the crank-drive grate is activated.

Crank-drive grate activation reduced

The activation value is used in the boiler statuses “Stoker fill“, “Heating“, “Re-ignition“, “FGR run-on“, “Clean FGR“ and “Fan run-on 1“.

Max temperature under the grate

The set temperature is used for monitoring the grate. As soon as the temperature value is exceeded just once, a warning is output. It the temperature under the grate remains above the set value for a duration of 30 minutes, or if it exceeds the set value a second time within 5 hours, an error message “Under-grate thermostat has tripped“ is output.

Ash screw 2 run-on time

The ash screw 2 runs in parallel with the combustion chamber ash screw. After the activation of the combustion chamber ash screw has ended, the ash screw 2 runs on for the set time in order to transport the residual ash away.

Temperature under the grate

Displays the temperature under the grate.

Cycle time of the crank-drive grate

Specifies the duration of the crank-drive grate cycle. At the start of the cycle, the crank-drive grate always runs for the set time or the calculated time, and then pauses until the end of the cycle.

Nominal current for combustion chamber ash screw

Specifies the nominal current of the drive of the combustion chamber ash screw as shown on the motor identification plate.

Number of WOS strokes per HE cleaning operation

Specifies the number of WOS strokes per heat exchanger cleaning operation.

Nominal current for the HE ash screw

Specifies the nominal current of the drive of the heat exchanger ash screw as shown on the motor identification plate.

Ash screw temperature monitoring

Maximum permissible temperature in ash screw duct

If the temperature sensor on the combustion chamber ash screw exceeds the set temperature, the feed rate is reduced to decrease the temperature and prevent the boiler from being overloaded.

Maximum permissible temperature in ash screw duct

In the event of an over-temperature in the ash screw duct, the temperature can be decreased by reducing the feed rate.

Time until ash screw duct reports an overtemperature error

This is the time after which a persistent ash screw duct overtemperature triggers an overtemperature error report.

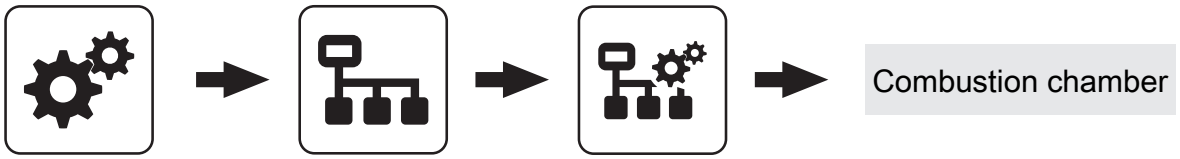
Combustion chamber ash screw duct temperature monitoring available?

Specifies whether a temperature monitor is installed on the ash screw channel of the combustion chamber.

Combustion chamber ash screw temperature

Reports the actual temperature of the combustion chamber ash screw.

Setting - Combustion chamber



System menu → System → Setting → Combustion chamber

Boiler underpressure setpoint

Desired underpressure which is to be maintained during the operation of the boiler.

Minimum combustion chamber temperature

Defines the minimum combustion chamber temperature in heating status. In conjunction with the parameters “Power increase from __ K above minimum CCT“ and “Min. Power at minimum combustion chamber temperature and flue gas temperature” the range of power increase due to the low combustion chamber temperature is calculated.

No feed if temp over

If the combustion chamber temperature in “Heating” status exceeds the specified value, the fuel feed-in is stopped.

Power increase from __° above minimum CCT

In conjunction with the parameter “Minimum combustion chamber temperature”, this defines the control range, within which the minimum output of the boiler is increased.

0% CCT signal at CCT

This is defined together with the parameter “100% CCT signal at CCT”.

100% CCT signal at CCT

Together with the parameter “0% CCT signal at CCT”, this defines the combustion chamber temperature signal.

Current CCT signal

Display of the current combustion chamber temperature signal.

Tertiary air boost via CCT signal

Adjusts the tertiary air boost based on the CCT signals. The increase is a linear interpolation of the CCT signal between 0% and the set value.

Start tertiary air at secondary air control

FGR cleaning duration

Specifies the duration for the automatic cleaning of the FGR duct in seconds.

Tertiary air delay

Specifies the time delay for the tertiary air in seconds. 67% of the required air flap position is reached within this period. The output reaches the setpoint when this time has elapsed approximately five times. The parameter has an attenuating function on the output signal of the tertiary air, thereby preventing the tertiary air flap from opening too quickly.

Reduce output via combustion chamber temperature 2 from

The output is reduced from this temperature at combustion chamber sensor 2 to lower the temperature.

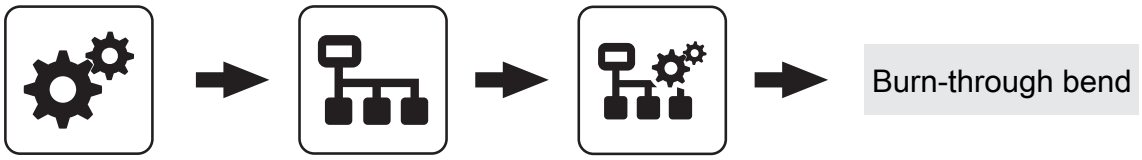
Combustion chamber sensor 2 installed

Specifies whether the combustion chamber sensor 2 is present.

Black underpressure sensor cartridge installed (type: 401.93000)

Specifies whether a white underpressure sensor cartridge is installed.

Setting - Burn-through bend



System menu → System → Setting → Burn-through bend

BTBC pump activation

Reports the current activation of the BTBC pump.

Max. permissible temperature in burn-through bend

If the temperature in burn-through bend exceeds the specified value, and alarm is triggered and an emergency shutdown of the boiler is executed.

Maximum speed BTBC pump

Reports the maximum value for activation of the BTBC pump.

Burn-through bend cooling run-on

After the boiler is switched off, if the boiler statuses are “Boiler off“, “Boiler ready“ or “Casing cooling“ the burn-through bend cooling runs on until this parameter is reached.

Reset time for BTBC controller Tn

defines the regulated range of the BTBC pump.

Temperature of burn-through bend

Reports the actual temperature of the burn-through bend.

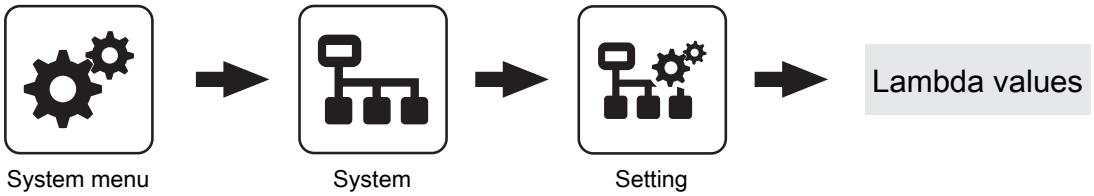
Gain for BTBC controller Kp

defines the regulated range of the BTBC pump.

Warning if temperature in the burn-through bend is greater than

A warning is output if the temperature in the burn-through bend exceeds this value.

Setting - Lambda values

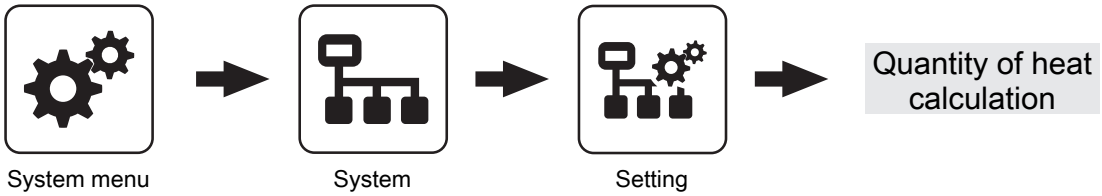


System menu → System → Setting → Lambda values

Maximum deviation of residual O2 from setpoint

Within this tolerance range, with reference to the residual oxygen content setpoint, the residual oxygen controller does not activate.

Setting - Quantity of heat calculation



Flow temperature sensor correction value

If, at the same ambient temperature, the flow temperature sensor and return feed sensor display different temperature values, this correction value is used to calibrate the difference between the flow sensor and the return sensor to "0". The corrected value is used only to calculate the quantity of heat does not affect the operation of the boiler. If the boiler temperature is used to calculate the quantity of heat, the correction value is applicable to the boiler sensor.

Flow temperature sensor input

Sensors 1/2 on the core module or a sensor on the hydraulic module can be used as flow temperature sensors. If an invalid sensor assignment is made, the value of the boiler sensor is used to calculate the quantity of heat.

Specific heat capacity

This parameter indicates the specific heat capacity of the heat carrier. The value for pure water (4180 Ws/kgK) is used as the default value.

Litres per pulse of flow through meter

If an external volume pulse transmitter is used, adjust this value accordingly.

Flow rate at 50% pump rotation speed

The parameter specifies the volumetric flow rate at 50% pump actuation.

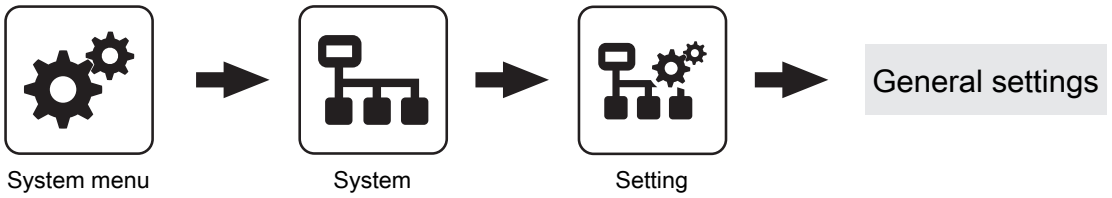
➲ "Calculating the feed output of the circulating pump" [▶ 98]

Flow rate at 100% pump rotation speed

The parameter specifies the volumetric flow rate at 100% pump actuation.

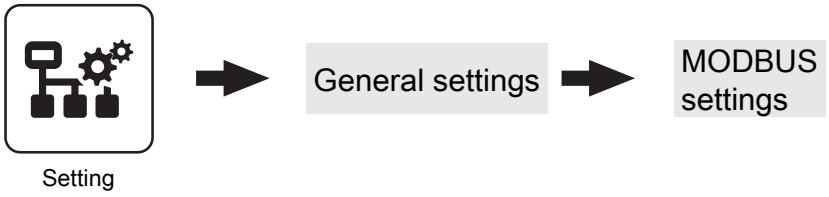
➲ "Calculating the feed output of the circulating pump" [▶ 98]

Setting - General settings



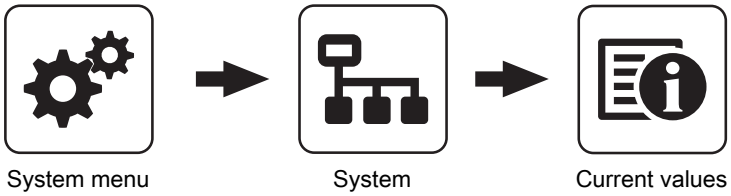
➲ "Boiler - General settings" [▶ 59]

MODBUS settings



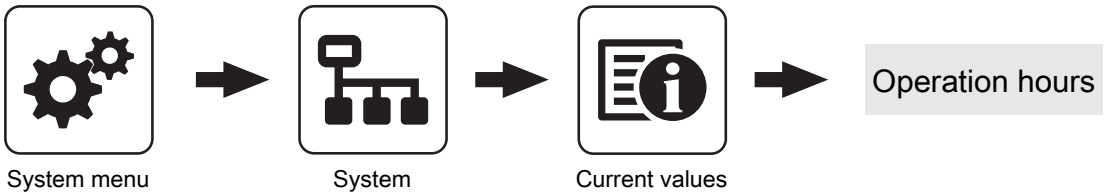
➲ "Boiler - General settings - MODBUS settings" [▶ 60]

4.14.2 System - Current values



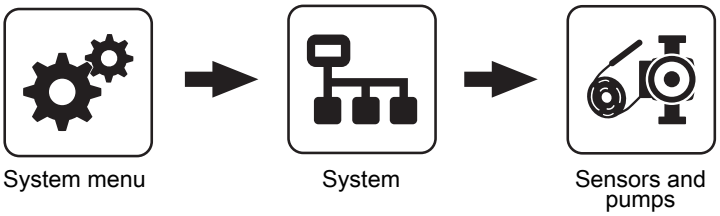
Display of the current value for the relevant parameter. The parameters displayed depend on the boiler configuration!

Operation hours



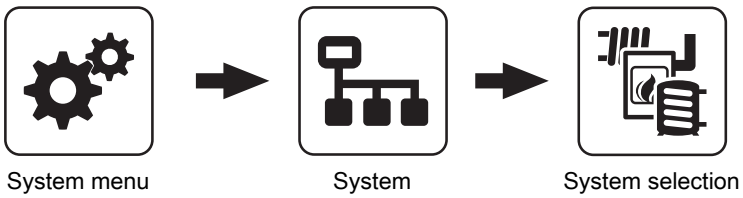
Display of the current number of operation hours of the respective unit and respective components. The parameters displayed depend on the boiler configuration!

4.14.3 System - Sensors and pumps



In the "`Sensors and pumps`" menu, all sensor inputs and pump outlets available in the hydraulic system can be allocated. The number of parameters depends on the configuration.

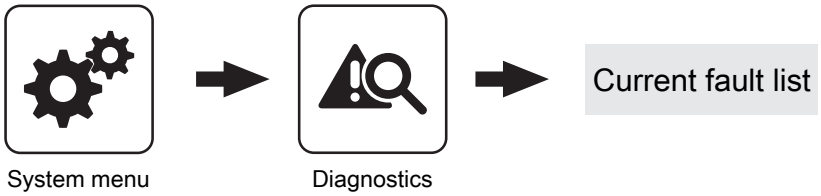
4.14.4 System - System selection



Menu for setting the configuration for systems that have not been configured with the setting wizard.

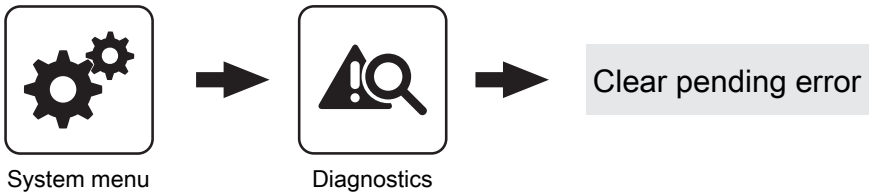
4.15 Diagnostics

4.15.1 Diagnosis – Current fault list



Display of the current fault messages. In addition, you can also invoke time information here, such as when the fault occurred, when the fault was acknowledged and when the fault was cleared.

4.15.2 Diagnosis – Clear pending error

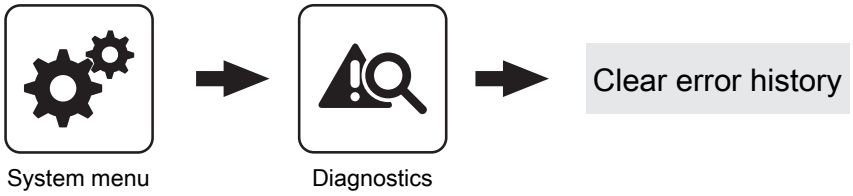


Used to delete current faults in the fault list. Depending on the system configuration, the status LED can flash red even though no fault messages are pending. This function can also be used to delete pending fault messages that are not visible.

4.15.3 Diagnostics - Error history

Up to 50 fault indication entries are stored in the error history. A fault can consist of up to 3 fault indication entries. You can determine what type of fault message it is, when the fault occurred (appeared), when the fault was acknowledged and when the fault was eliminated (cleared). If all 50 fault indication entries are in use and there is another fault indication entry, the oldest entry will be deleted to make room for the current one.

4.15.4 Diagnostics - Clear error history

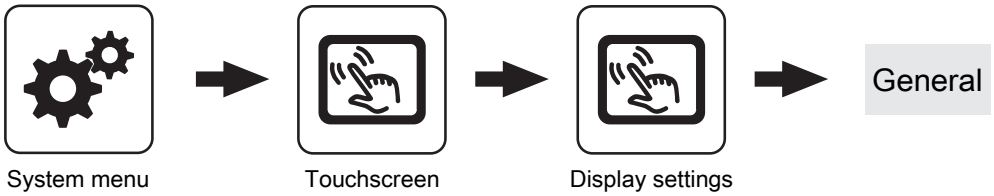


The entire error history can be deleted using this function. From this time on, the error history will be filled again with new fault messages.

4.16 Touchscreen

4.16.1 Touchscreen - Display settings

Display settings - General



Brightness

Display of the light sensor’s evaluation of the current brightness in the room for adjusting the backlight.

Maximum backlight

The brighter it is in the room, the more the background of the touch display is illuminated. This is where you can limit the maximum backlight.

Minimum backlight

The darker it is in the room, the less the background of the touch display is illuminated. This is where you can set the minimum backlight.

Delay time for screen saver (0 deactivates the screensaver)

If the touchscreen is not touched within the set time, the screensaver will activate and the screen will go dark. To disable the screensaver, set the delay time to “0”.

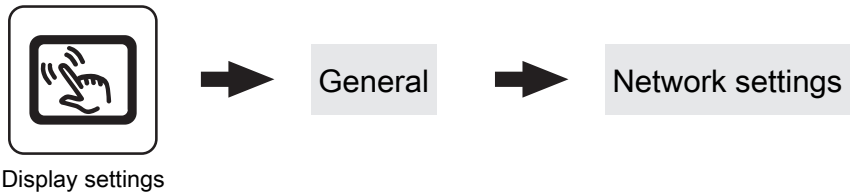
Module address

This is where you can change the module address if it is incorrectly set.

Module address 0: Boiler console
Module address 1-7: respective room console 3200 with touchscreen

NOTICE! Once you have changed the module address, you will need to restart the boiler controller (switch main switch on boiler off and on)!

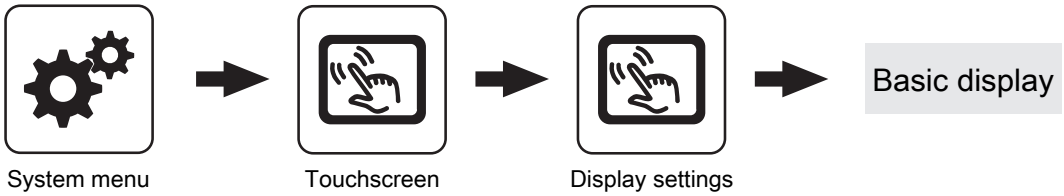
Network settings



Obtain IP address automatically

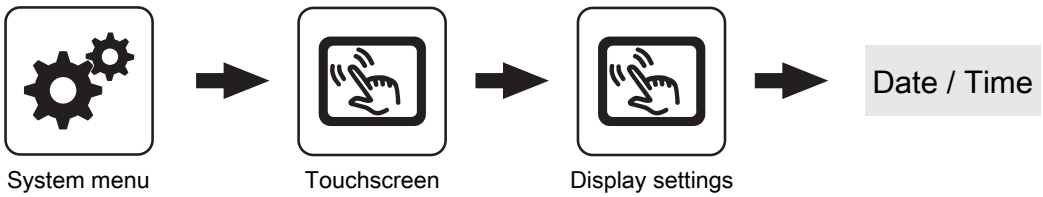
- **On:** The address in the local network (IP address), the subnet mask, default gateway and DNS server are automatically assigned by the router/server.
- **Off:** IP address, subnet mask, default gateway and DNS server can be manually set.

Display settings - Basic display



Figures 1 … 6
On the basic display, up to six different information displays can be freely selected. The selection depends on the system configuration.

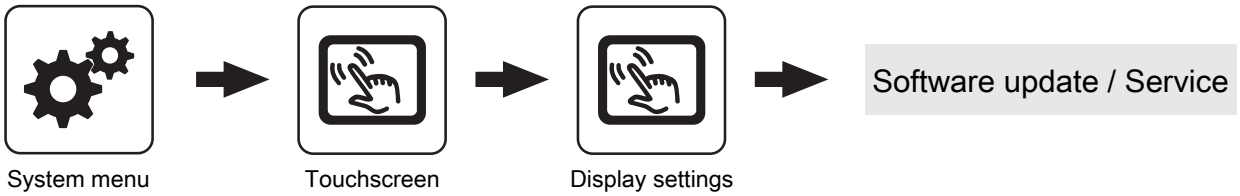
Display settings - Date / Time



Automatic switching between standard/daylight saving time
Used to deactivate switch to daylight saving time (factory setting: YES).

Date / Time
Display and setting of the date and time.

Display settings - Software update / Service



Calibrate screen
➲ "Calibrating the touchscreen" [▶ 107]

Restart control Carry out update
➲ "Software update Lambdatronic 3200" [▶ 109]

Restart display
Touch control unit is restarted and the data is reloaded from the core module.

Restore control device to factory settings (restart is carried out)
The touch display is reset to the factory setting. Data stored on the touch display (e.g. setting wizard) is completely deleted. Only perform if the system must be completely reconfigured (e.g. when replacing the core module).

4.16.2 Touchscreen - Display operating rights

In this menu the operating rights for the individual room consoles are allocated. If access from a room console to a heating system component is permitted, the corresponding parameter must be set to “YES”. The number of menus as well as the parameter entries depend on the system configuration!

NOTICE! The operating rights of the room consoles should be allocated from the boiler console, as unrestricted access is only possible here!

“Touch display with address 1 – 7” and “Button display with address 1 – 7”

Heating circuit system:

Allow access to heating circuit 01 ... 18?
Specifies whether heating circuit 01 … 18 can be accessed from touchscreen 1 … 7.

DHW tank system:

Allow access to DHW tank 01 ... 08?
Specifies whether DHW tank 01 … 08 can be accessed from touchscreen 1 … 7.

Buffer tank system:

Allow access to buffer tank 01 ... 04?
Specifies whether the buffer tanks 01 … 04 can be accessed from the touch screen displays 1 … 7.

Solar panel system:

Allow access to solar system 01?
Specifies whether solar system 01 can be accessed from touchscreen 1 … 7.

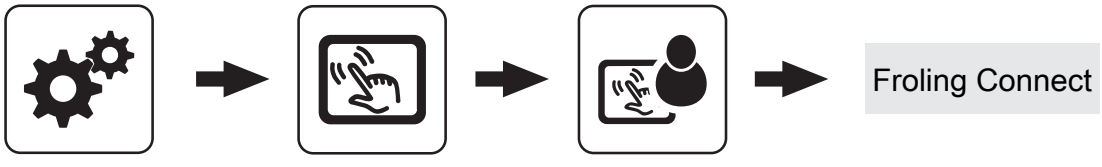
Heating system:

The parameters displayed depend on the configuration.

Boiler:

Switch boiler on/off via room console
If this function is activated, the respective room console is enabled for switching the boiler on and off. In order to be able to operate the boiler, remote switching on the boiler display must also be activated.

Froling Connect



For connection via the froeling-connect.com online platform using a touchscreen, the issue of a password is required.

NOTICE! The same password can be assigned for each touch display!

Password for boiler display
Password for boiler display can be issued.
Password for Touch display with address 1 … 7

Password for boiler display
Password for the touchscree with address 1 … 7 can be issued.

4.16.3 Touchscreen - Display allocation

Heating circuit system:

Touch display with address 1 ... 7 is assigned to the following heating circuit:
To assign a room console to a heating circuit, the respective heating circuit number with its address must be set on the room console. The parameters are set to “none” at the factory!

Button display with address 1 … 7 is assigned to the following heating circuit:
To assign a room console to a heating circuit, the respective heating circuit number with its address must be set on the room console. The parameters are set to “none” at the factory!

DHW tank system:

Touchscreen with address 1 ... 7 is assigned to the following DHW tank:
To assign a DHW tank to a specific room console, the respective DHW tank number with its address must set on the room console. The parameters are set to “none” at the factory!

Button display with address 1 ... 7 is assigned to the following DHW tank:
To assign a DHW tank to a specific room console, the respective DHW tank number with its address must set on the room console. The parameters are set to “none” at the factory!

5 FAQ

5.1 Activation options of pump outlets

Pump 0.1 – 7.2, pump 1

The following settings are possible at the hydraulic modules as well as at pump 1 on the core module with pump outlets 0.1 – 7.2.

- **Pump without control line)**
  Set when a standard pump is run at the respective output. This is controlled at the 230V output using pulse packets.
- **HE pump without control line**
  Set when a high efficiency pump without control line (e.g. Grundfos Alpha, WILO Yonos Pico, etc.) is run at the respective output.
- **Field pump / PDM**
  There is a permanent power supply of 230V at the output for the high efficiency pump. The pump is controlled using pulse duration modulation at the respective PDM output.
- **Solar pump / PDM**
  Here again, the pump is controlled by means of pulse duration modulation at the respective PDM output. In this case, however, the characteristic line is inverted and can only be used for specially marked high efficiency solar pumps.
- **Field pump PDM +valve**
  The signal for the field pump is emitted at the PDM output. If the signal exceeds 2%, the 230V output is switched on. If the signal is below 2% for more than 4 minutes, the output is switched off again.
- **PDM sol.pump +valve**
  The signal for specially marked high efficiency solar pumps is emitted at the PDM output. If the signal exceeds 2%, the 230V output is switched on. If the signal is below 2% for more than 4 minutes, the output is switched off again.
- **Field pump / 0–10V**
- **Solar pump / 0–10V**
- **Field pump 0–10 +valve**
- **Sol. pump 0–10V +valve**
  The same functions that apply with PDM apply to the parameter values with 0-10V. The only difference is that instead of pulse duration modulation, a 0-10V signal is used to control the pump.
- **Switch valve**
  When set to “Isolating valve” the output is activated either with 0% or 100%. This setting value is only available in the “Water” or “Boiler 2” menu.

HKP0

The following applies to pump outlet HKP0 at the core module:

- Relay output
- Speed control is not possible

5.2 Pump stall protection

After extended standstill times, there is a risk the pump drive may block due to corrosion and deposits. The pump stall protection feature is intended to prevent this.

The control ensures that the circulation pumps are switched on briefly on a regular basis, even outside the season of use.

At that time, the pumps are activated for 15 seconds at 100%.

The following components are affected:

- DHW loading pump
- Buffer pump
- Collector pump (not applicable to system 12 and system 13)
- Difference control pump
- Heating circuits (15 seconds pump run, subsequently the mixer starts up and shuts down again)

5.3 Boiler operating statuses

Availability of the listed operating statuses depend on the set boiler type!

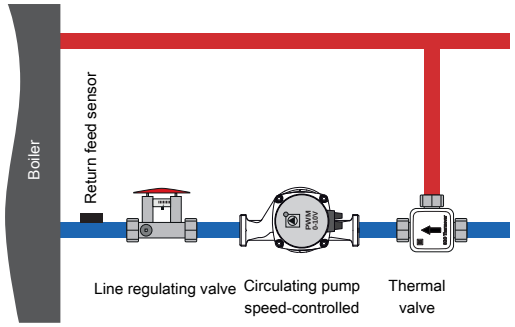
Preparation	The boiler is ventilated, the Lambda probe heated and the ash screws are switched on; underpressure test.
Heating up	The stoker is filled with fuel and a quantity of fuel that can be ignited is pushed onto the grate.
Close BBF	The burn back protection system (burn-back flap) closes. (depending on the boiler type).
Pre-heating	The fan-assisted ignition switches on and the fuel is pre-warmed until a flame forms. For this period infeed is deactivated.
Pre-heating – Ignition	
Ignition	The fan-assisted ignition ignites the fuel. The flame is distributed throughout the entire combustion chamber. Control of the induced draught fan and infeed for this operating status are defined in the "Ignition" parameter menu.
Open BBF	The burn back protection system (burn-back flap) opens. (depending on the boiler type).
Heating	The boiler controller controls combustion according to the boiler setpoints.
Heating - Cleaning	The output of the boiler and the infeed unit are reduced and the grate is cleaned. After cleaning the boiler output is increased again.
Empty stoker	The stoker is emptied according to procedure.
Awaiting shutdown	Safety time during which the residual material on the grate is burnt.
Fan run-on 1	1. Safety time during which the residual material on the grate is burnt.
Fan run-on 2	2. Safety time during which the residual material on the grate is burnt.
Stopped	The combustion process has ended.
Tip grate	The grate opens / closes a specified number of times.
Cleaning	The grate is tipped and the boiler is ventilated for 1 minute. The stoker switches on and the ignition opening is cleared by blowing. The ash screw runs and the grate open / close twice the specified number of times during the entire procedure. This operating status can only be opened in "`Boiler off`" mode. The status that follows is "`Boiler off`", and the boiler must be activated by pressing the start key.
Standby	The boiler is ready to start and is waiting for a heat requirement (a start command).
Cleaning possible	Operating status for boiler cleaning tasks, which is activated after the service key has been pressed and a cleaning cycle has been carried out. The grate is in open position, the tipping grate and ash screw can be switched off and on manually.
Boiler off	The boiler controller now only controls the connected heating components. All parts of the boiler are deactivated. Lambda probe heating remains active for 1 hour after the operating status has been reached.
Fault	CAUTION - There is a fault!
TS (Troubleshooting)	If a fault occurs during heating (up), the boiler will switch to "`Troubleshooting`" status. In this status the stoker is emptied at minimum fuel feed-in (Parameter: "`The time until the stoker is empty is`") whilst the ignition fan is active. The boiler then switches to "`Shutdown wait`" status and "`Tilt grate`". It will remain in this status for at least 30 mins depending on the boiler output, the fuel used and the parameters set.

5.4 Determination of the quantity of heat

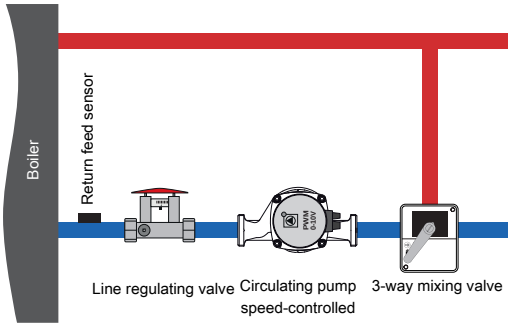
5.4.1 Assembly Information

The contact sensor and the line regulating valve must be positioned in the direction of flow downstream of the circulating pump and immediately upstream of the return connection of the boiler. Additional contact sensors and line regulating valves are required for boilers without return temperature control or return temperature control with thermal valve. A return feed sensor is already fitted on the return temperature control with 3-way mixing valve, which means that only the line regulating valve is required additionally.

Return temperature control with thermal v. (FE pump assembly)



Return temperature control with mixing v. (ME pump assembly)

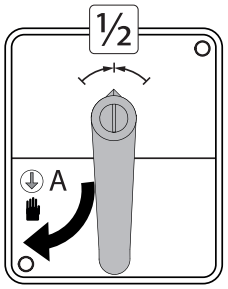


5.4.2 Functioning and configuration

Software version V50.04 – B05.19 at minimum is required for the heat quantity calculation to work. The difference between the boiler temperature and the boiler return temperature as well as the flow of the circulating pump are used to calculate the heat quantity.

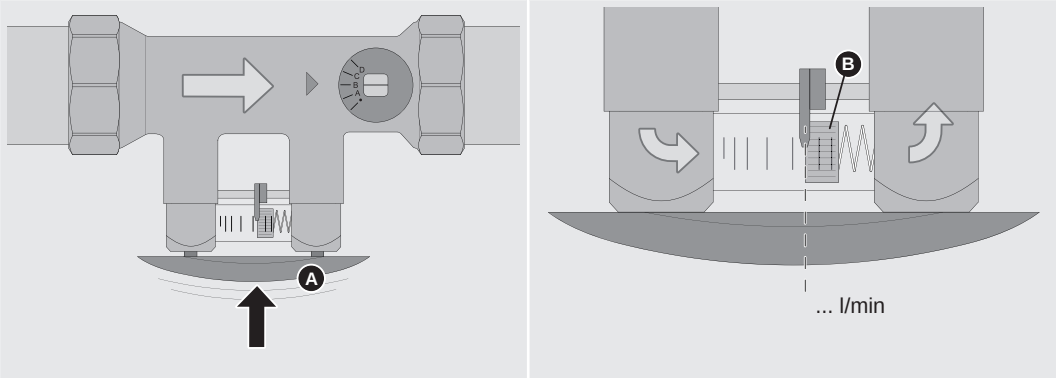
Calculating the feed output of the circulating pump

Boiler with 3-way mixing valve



❒ Set mixing valve to manual operation and turn the lever to the central position

❒ Activate the circulating pump in manual operation with 100% speed



❒ Press the handle (A) on the line regulating valve

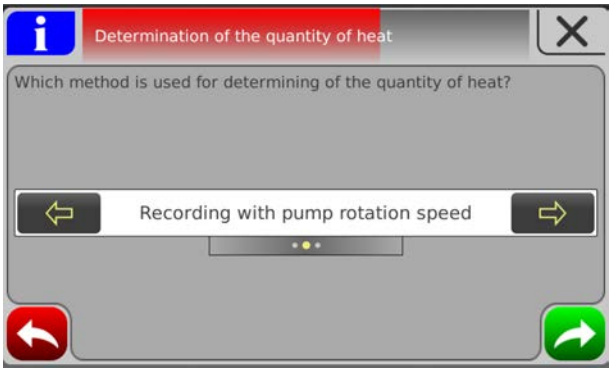
❒ Read and record the flow rate in l/min at the underside of the floater (B)

❒ Activate the circulating pump in manual operation at 50% speed

❒ Press the push bar on the line regulating valve; make a note of the flow on the scale

Setting the type of heat quantity calculation

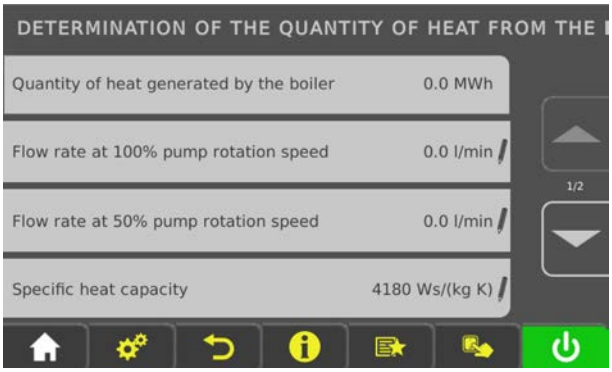
❒ In the boiler's setting wizard, select "`Record with pump speed`"



Configuring the heat quantity calculation

❒ Go to the menu "System → Settings → Boiler heat quantity calculation"

❒ Enter the recorded values for the flow of the circulating pump at the respective parameter



5.5 Boiler modes

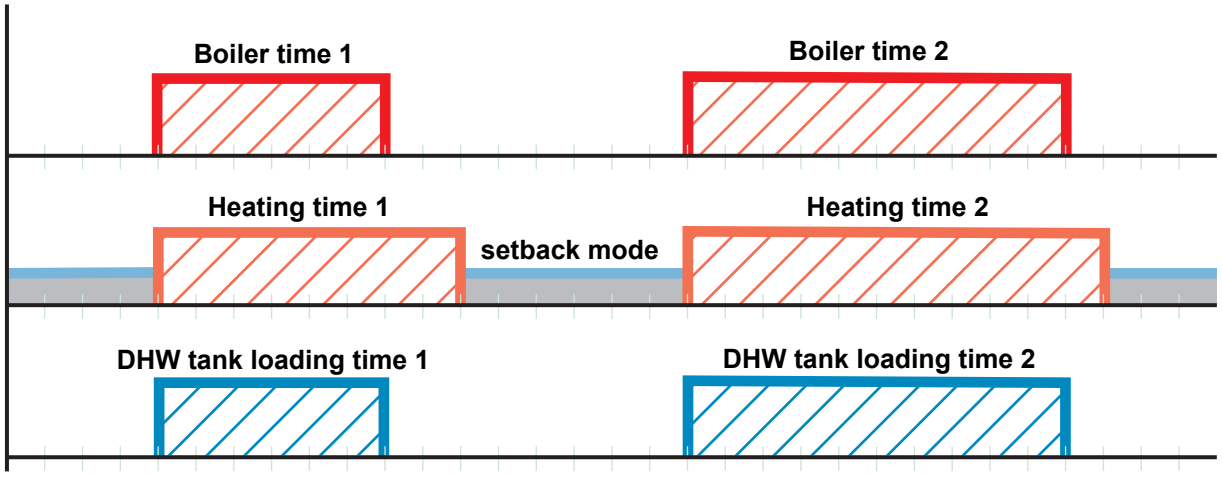
5.5.1 "Automatic" mode without storage tank

When "Automatic" is selected without a storage tank, the boiler only produces heat during the specified boiler times. Outside these times the boiler follows the shutdown procedure and switches to "Standby" status. It is, therefore, important to note that in this mode the heating circuits and DHW tank are only supplied with heat during the boiler times.

In Example 1 the boiler times have been set to cover the necessary heat requirement. The heating times and DHW tank loading times have been set within the boiler time range, with the heating time being extended approximately one hour beyond the boiler time. This allows the residual energy in the boiler to be used by the heating circuits after the end of the boiler time.

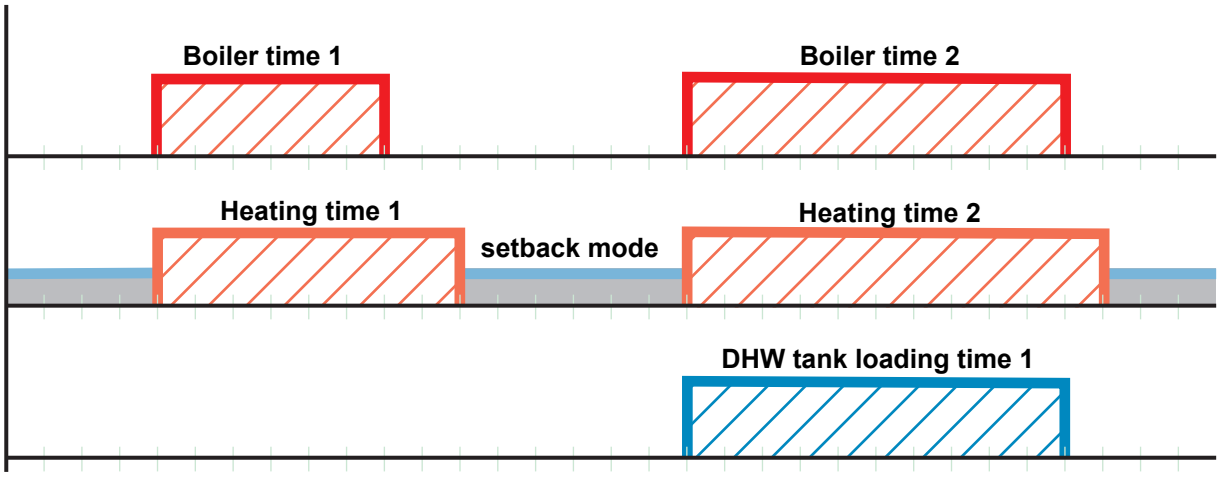
Note that outside the boiler times for setback mode, heat is only available until the boiler temperature falls below the setting value (parameter "Minimum boiler temperature to release all pumps").

Example 1: "Automatic" mode without storage tank



Tip: In systems with solar panels, choose the DHW tank loading time so that solar energy can be used.

Example 2: "Automatic" mode without storage tank with solar panel system



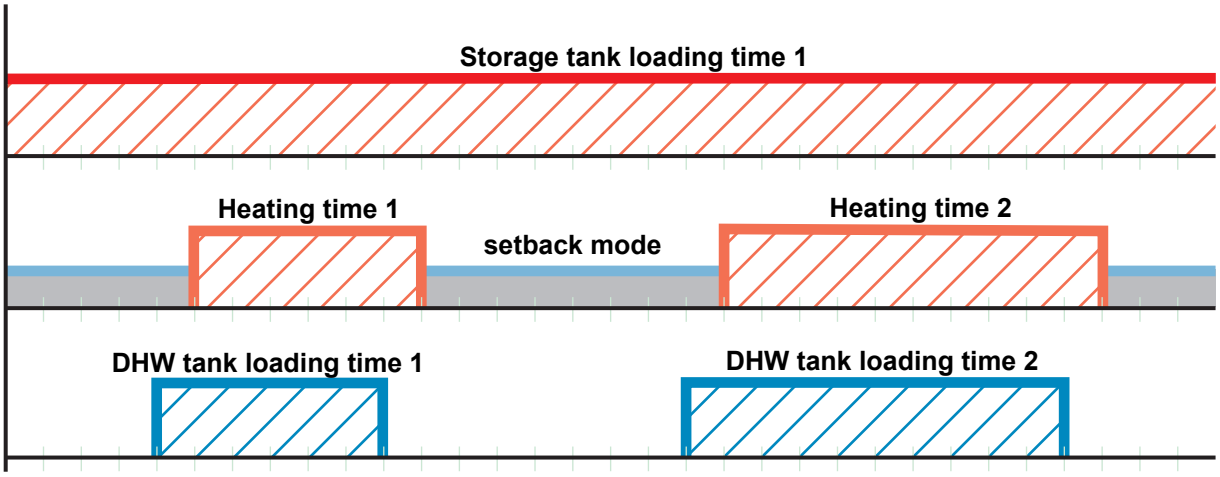
5.5.2 “Automatic” mode with storage tank

When “Automatic” is selected with storage tank, the boiler only produces heat if the storage tank actually requests heat within the specified storage tank loading time. Outside these times the boiler is in "Standby" status.

The heating times should be set within the storage tank loading times so that the provision of heat is guaranteed over the entire heating time.

Note that the heating circuit and DHW tank are only supplied with heat for as long as the storage tank temperature is sufficient for the demand.

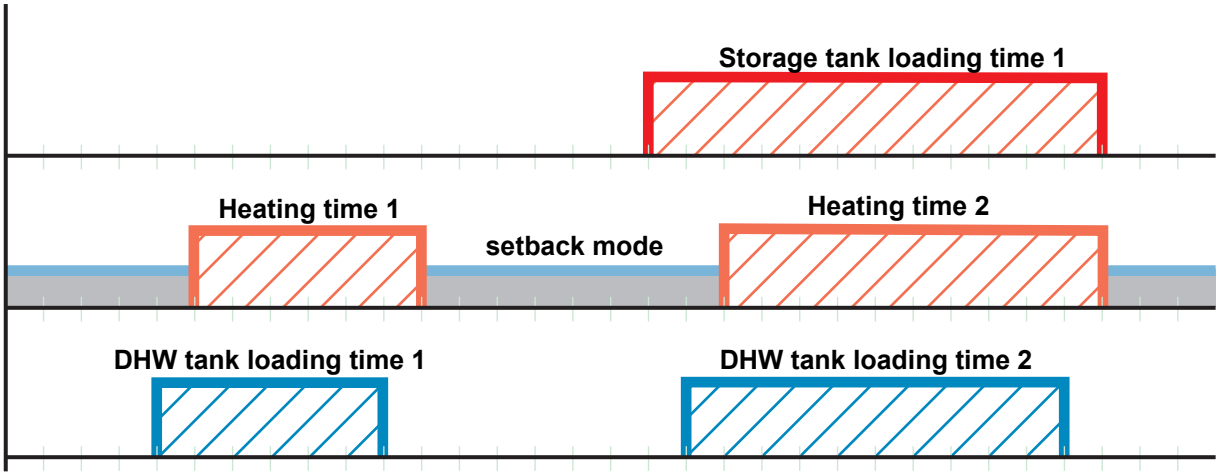
Example 1: “Automatic” mode with storage tank



Tip: In systems with a storage tank and solar panels, choose the storage tank loading time so that solar energy can be used.

In order to ensure that there is sufficient heat at the start of the DHW tank loading time and heating time, we recommend setting the storage tank charging time to begin before the start of the DHW tank time or heating time.

Example 2: “Automatic” mode with storage tank and solar panel system

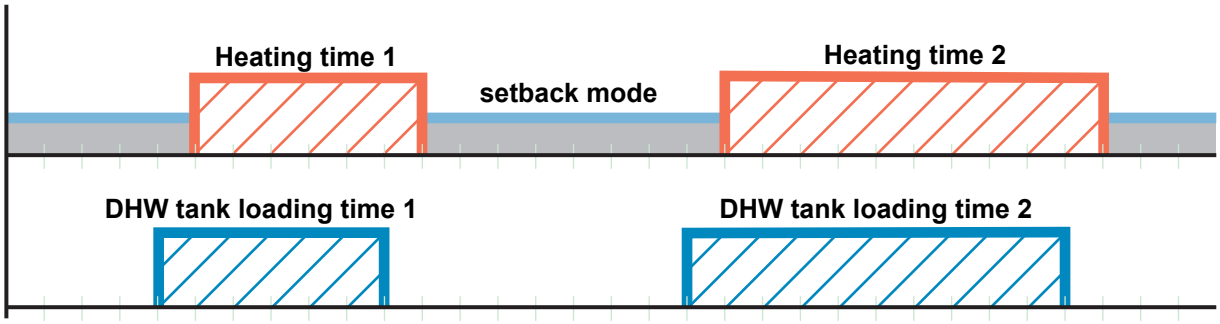


5.5.3 “Continuous load” mode without storage tank

When “Continuous load” is selected, the boiler produces heat around the clock, in other words it tries to maintain its boiler temperature setpoint 24 hours a day. The boiler time settings are ignored in this mode.

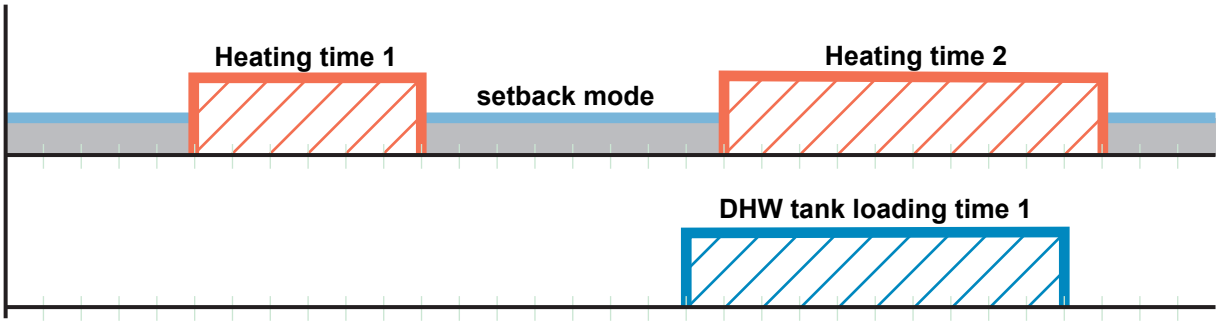
The heating times and DHW tank loading times can be distributed throughout the day as required.

Example 1: “Continuous load” mode



Tip: In systems with solar panels, choose the DHW tank loading time so that solar energy can be used.

Example 2: “Continuous load” mode with solar panel system



5.5.4 “Continuous load” mode with storage tank

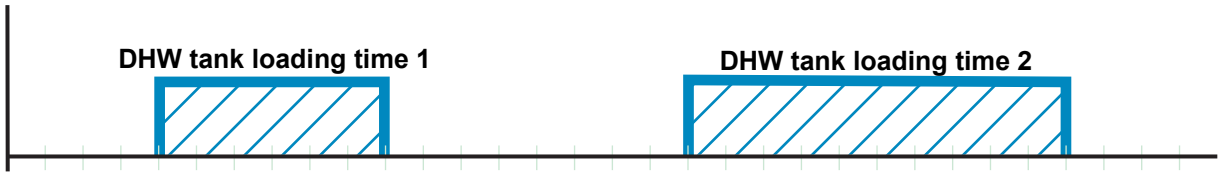
To ensure efficient operation, set systems with a storage tank to “Automatic” mode rather than “Continuous load” mode.

➲ ""Automatic” mode with storage tank" [▸ 101]

5.5.5 “Domestic hot water” mode without storage tank

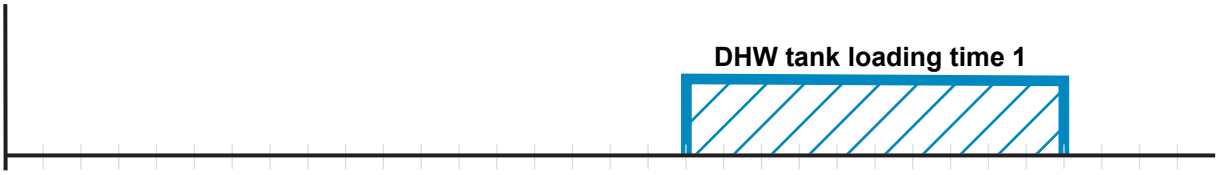
When “`Domestic hot water`” is selected, the boiler only produces heat if the DHW tank actually requests heat within the specified DHW tank loading time.

Example 1: “Domestic hot water” mode without storage tank



Tip: In systems with solar panels, choose the DHW tank loading time so that solar energy can be used.

Example 2: “Domestic hot water” mode without storage tank with solar panel system

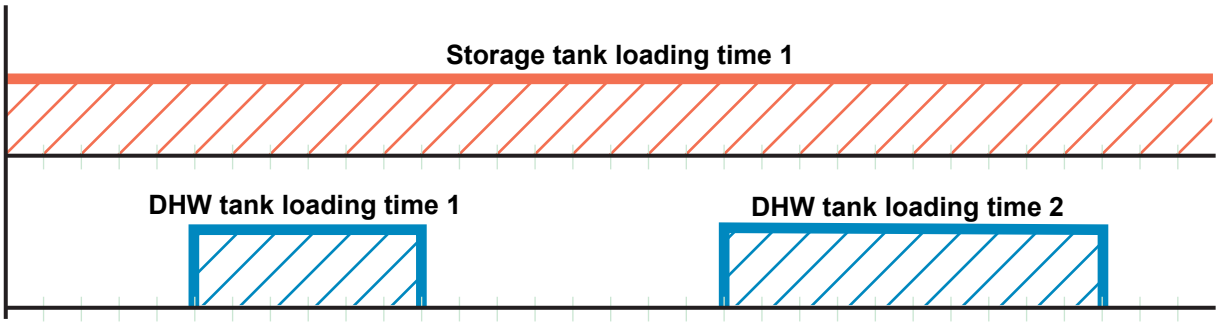


5.5.6 “Domestic hot water” mode with storage tank

In systems with a storage tank, note that in “`Domestic hot water`” mode, the storage tank loading times remain active as the DHW tank is supplied with heat from the storage tank.

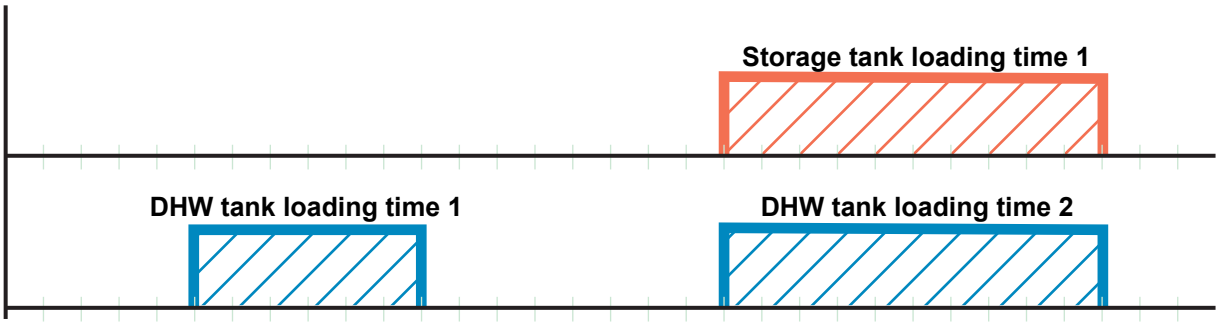
Within the storage tank loading time the boiler only produces heat if the storage tank temperature is below the minimum value and the DHW tank is requesting heat.

Example 1: “Domestic hot water” mode with storage tank



Tip: In systems with a storage tank and solar panels, choose the storage tank loading time so that solar energy can be used.

Example 2: “Domestic hot water” mode with storage tank and solar panel system



5.6 Setting times

The desired time window for the component can be set in the "Times" tab in the individual menus of the heating components (heating circuits, DHW tanks etc.). The structure of the time menu and the procedure for changing the times are always the same.

❒ Use the left or right arrow to navigate to the desired day of the week

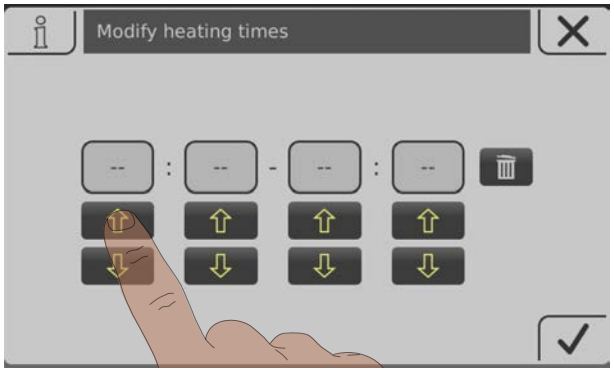
❒ Tap the symbol under the day of the week

↳ The edit window will appear

You can specify up to four time windows per component and day.

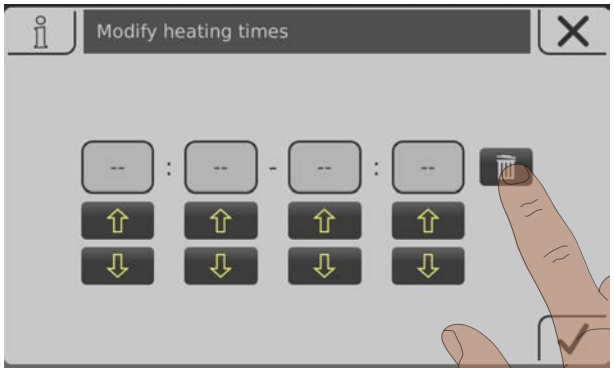
❒ Tap the desired time window

❒ The time window will open for editing
❒ Set the start and end time for the time window using the up and down arrows
❒ Save the time window setting by tapping on the confirm icon



If you want to apply the time window setting to another day in addition, you can do this by activating the relevant day.

A set time window can be deleted by tapping on the “Recycle bin” symbol.

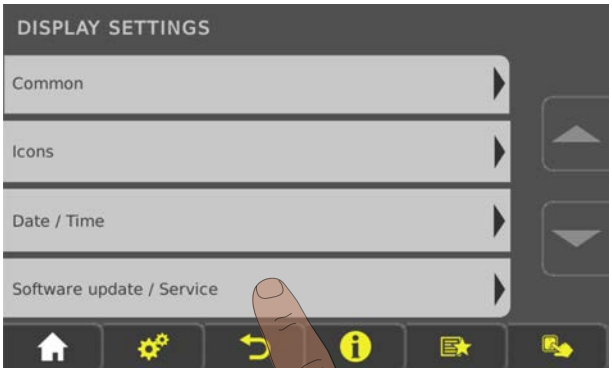


5.7 Calibrating the touchscreen

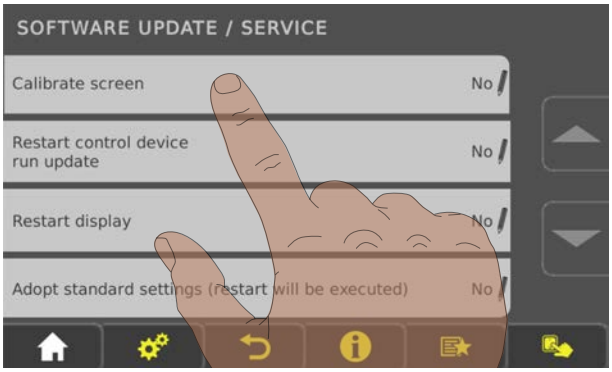
If the touchscreen stops working properly, it will need to be calibrated.

❒ Go to the “Display settings” menu

❒ Scroll down until the “Software update / Service" submenu appears and open the submenu

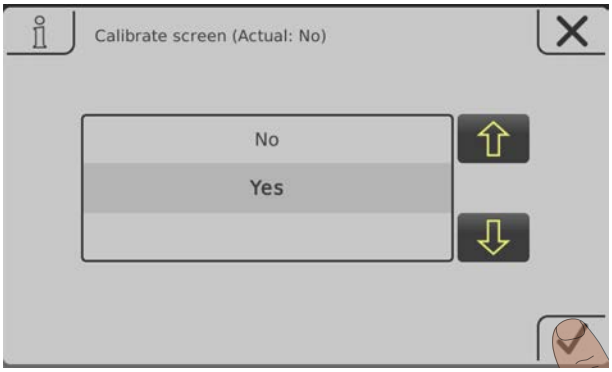


❒ In the “Software update / Service" menu open the “Recalibrate touch control” parameter



❒ Set the parameter to “YES” and confirm at the bottom right

↳ The touchscreen will restart and begin calibrating



To calibrate the touchscreen, you much press five points indicated by a crosshair in the order shown. The control will restart after calibration.

NOTICE

Inaccurate calibration

If you do not tap the indicated points accurately, the control may stop working properly and a software update may be required.

5.8 Software update Lambdatronic 3200

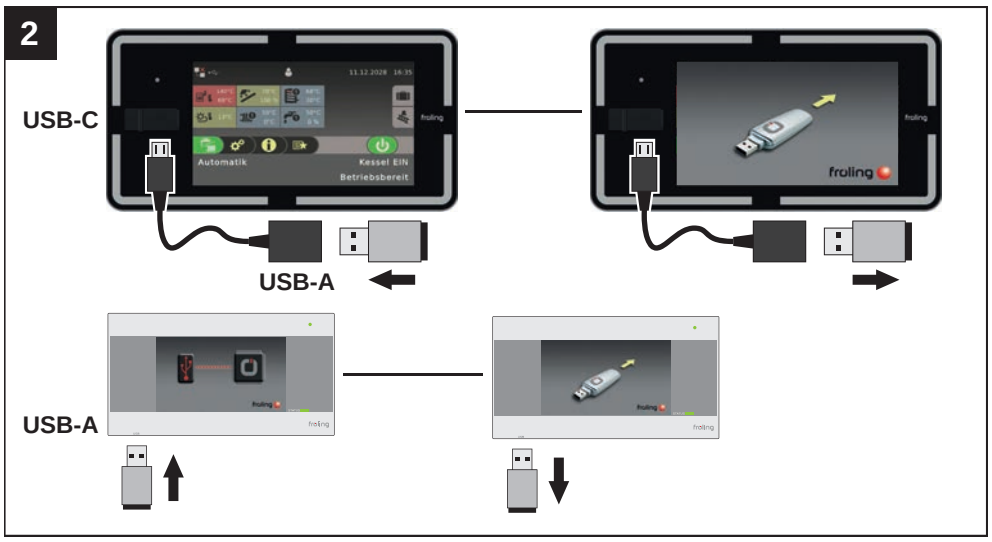
The following description shows the software update process for systems with Lambdatronic 3200 and a touch control in the system environment (also applies to systems with button boiler console and touch room console). The Froling Flash Update Wizard (core module) as well as a USB storage device is necessary to perform the software update. The procedure for establishing a connection and any necessary bootloader update is described in the documentation of the Flash Update Wizard.

Overview of main steps during a software update

❒ Perform flash update - but do not close the Wizard

➲ "Carrying out a software update on the boiler controller" [▸ 110]

❒ Perform software update of all touch controls



➲ "Carrying out a software update on the touch control" [▸ 112]

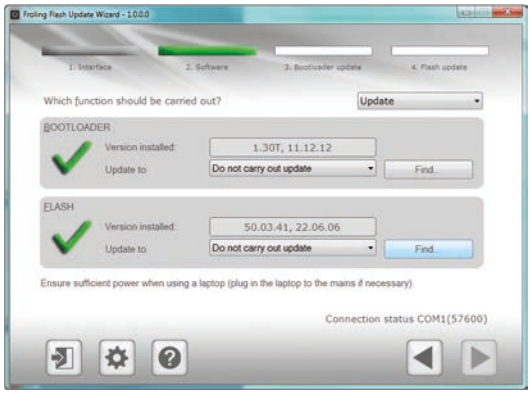
❒ Close Flash Update Wizard - restart controller

➲ "Finishing a software update" [▸ 113]

5.8.1 Carrying out a software update on the boiler controller

Selecting a Flash file

Once the connection has been established, the main window displays the update files which can be installed:



- The "Version installed" field displays the Flash version which is currently installed on the boiler controller
- There is a drop-down list next to the "Update to:" field which shows the Flash files available in the standard folder

If the Flash file is located in the standard folder:

❒ Select the required Flash file from the drop-down list

If the Flash file is not located in the standard folder:

❒ Click on the "`Find`" button in the "FLASH" section

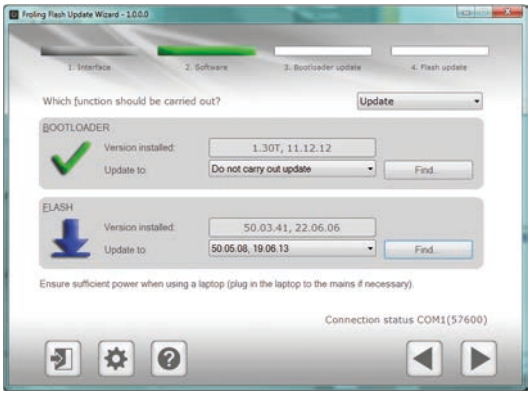
↳ A window is displayed where you can search for the Flash file

❒ Navigate to the folder where the file is saved

❒ Select the Flash (*.s19) file and click on the "Open" button

Starting the Flash update

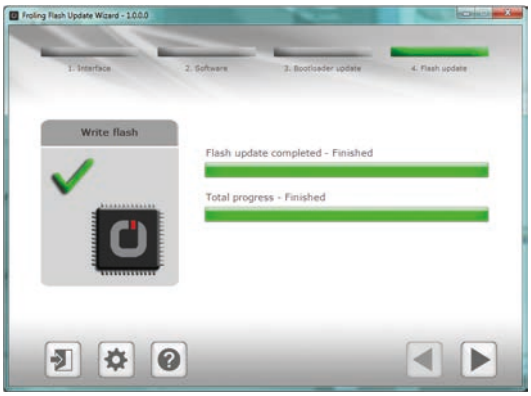
After selected the desired Flash file, it will be displayed next to the "Update to:" field:



❒ Click on the "Next" button

↳ The update process will now start and a progress bar displays the current status

When the flash update is successfully transferred to the boiler controller, the following window appears:



NOTICE! Do not close the update at this time and do not disconnect the boiler controller!

5.8.2 Carrying out a software update on the touch control

NOTICE! If several touch controls are installed, we recommend the use of several USB sticks to perform the updates in parallel!

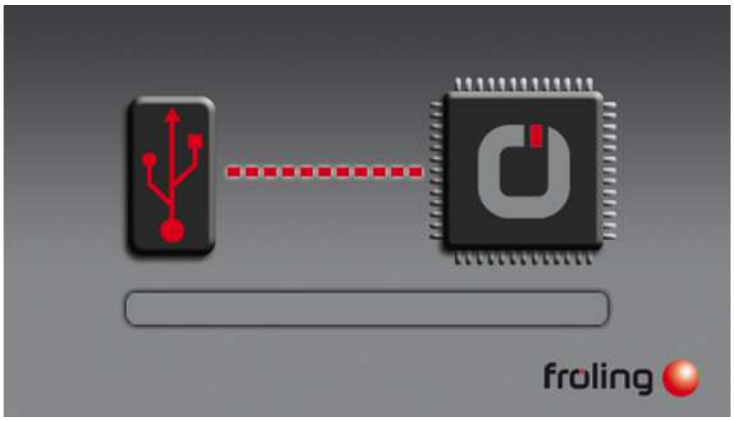
❒ Insert the USB stick with the necessary data (autostart.txt, froresetdemo.inc, frorestart.inc, rootfs.ubi, update, V 60.01 B01.38.15 K37) into the USB port.

↳ Note: the data files must not be located in sub-directories!

↳ System message for restart is displayed

❒ Tap “OK” to carry out a restart of the touch control

↳ After the restart, the update process will begin automatically



Once the update is complete, a message will appear that you can remove the stick

❒ Remove the USB stick

↳ The touch control restarts automatically

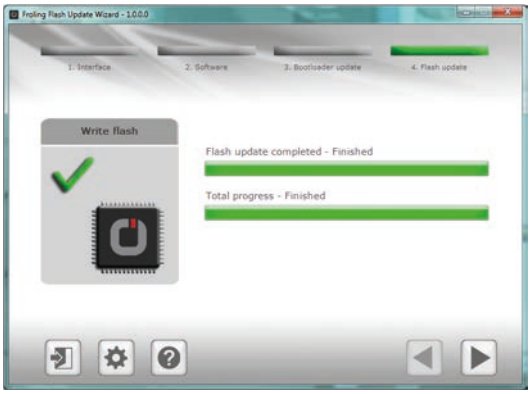
The touch control software is up-to-date following the restart.

❒ Perform updates to any other touch controls

5.8.3 Finishing a software update

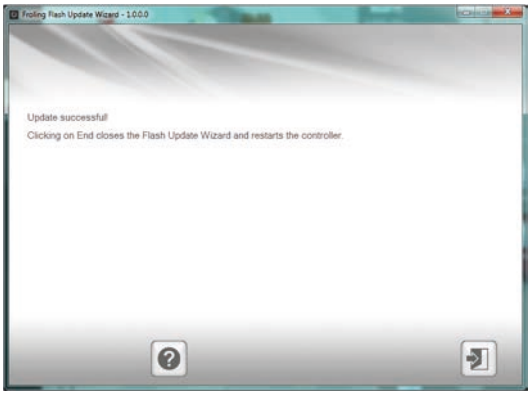
When the software update has been performed on all touch controls, the Flash Update Wizard must be ended correctly.

End flash update



❒ Click on the "Next" button

↳ The completion window appears



❒ Clicking on "Close" closes the Flash Update Wizard and restarts the boiler controller

↳ After restarting the boiler controller, check whether all touch controls have started up correctly

NOTICE! If not all touch controls connect to the boiler control, a restart of the entire system (main switch OFF/ON) is necessary!

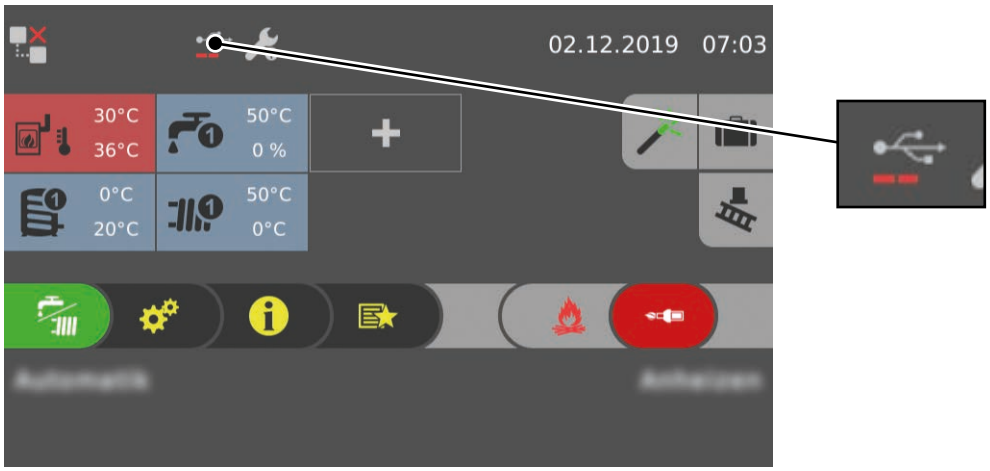
5.9 USB data recording

❒ Switch off the boiler using the main switch

❒ Turn on the main switch and connect USB to the extension

↳ The USB must not contain a software update

↳ Recording starts automatically once the touch display has started



Data recording is indicated in the status line by means of the USB symbol with an activity bar.

Notes

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