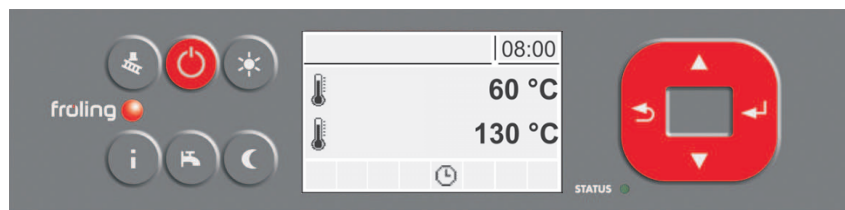


S-Tronic Plus / Lambda - S3 Turbo

Core module version 55.04 - Build 05.21



Translation of original German version of service handbook for technicians.

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

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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:



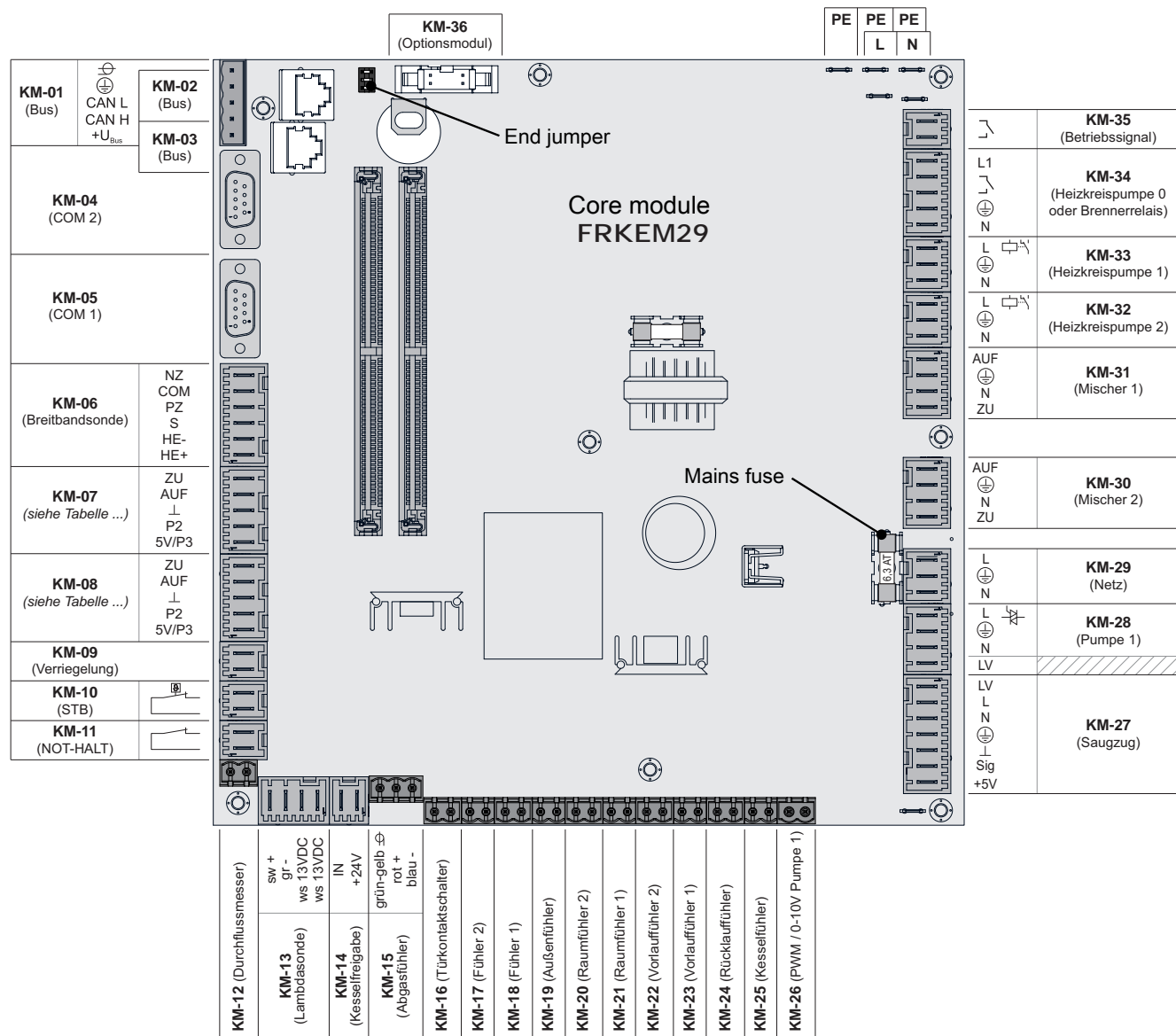
- ☐ Shut down the boiler according to procedure ("Off" operating status) and allow it to cool down
- ☐ Protective gloves must usually be worn for work on the boiler, and it should only be operated using the handles provided
- ☐ Insulate the flue gas pipes and do not touch them during operation

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



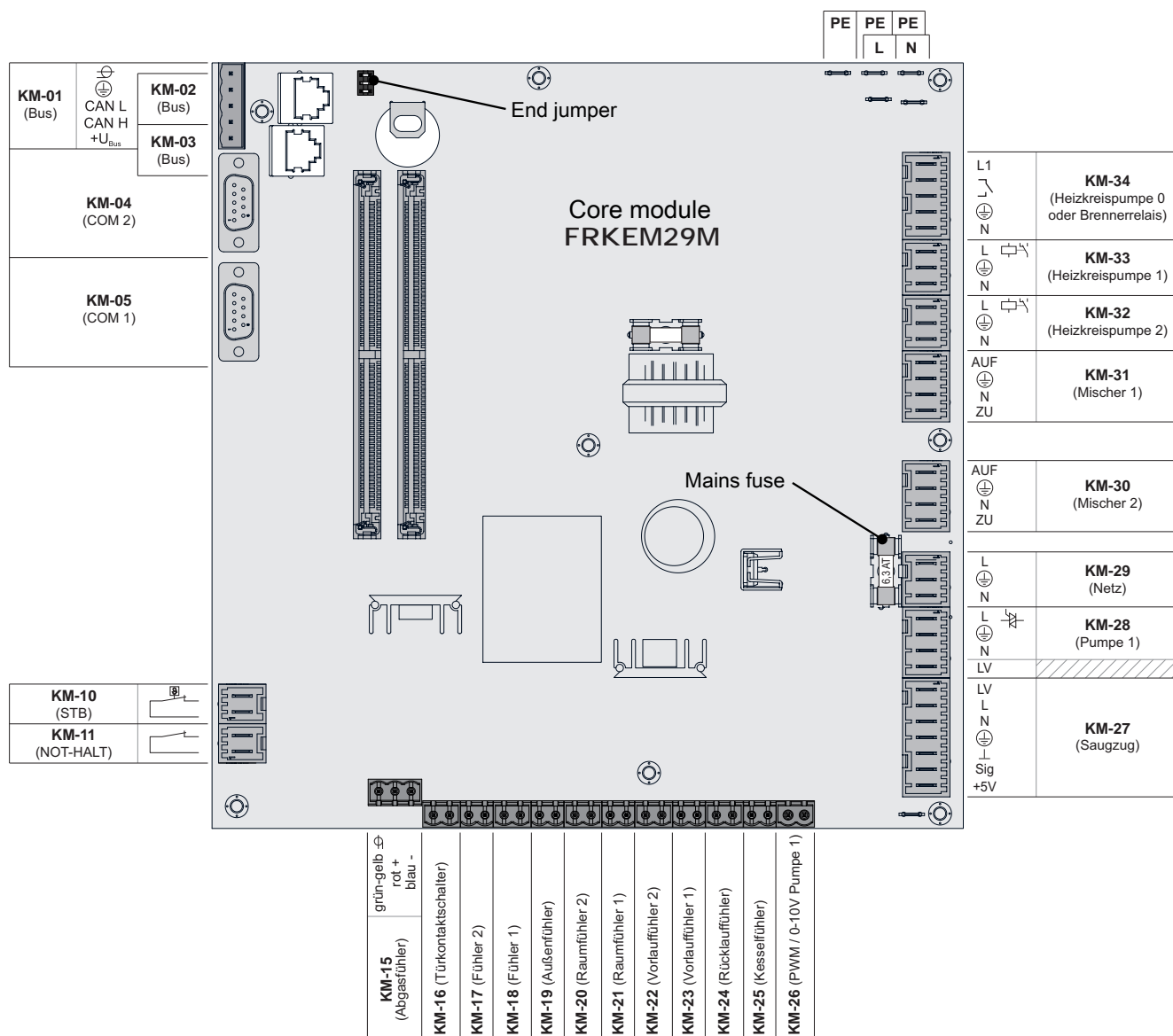
Connection / Name		Note
KM-01	BUS	Connection with cable – LIYCY paired 2x2x0.5; ➡ "Connecting the bus cable" [▶ 31] Caution! CAN L and CAN H must not be connected to +U _{BUS} !
KM-02	BUS	Patch cable CAT 5 RJ45 SFTP 1:1 Assignment: pellet module connection
KM-03		
KM-04	COM 2	Null modem cable 9-pin SUB-D; 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
KM-06	Broadband probe	Connection cable ¹⁾ 5 x 0.75 mm ² Connection of a Bosch (item number 69001A) or NTK (item number 69003) broadband Lambda probe
KM-07	Secondary air	Connection cable ¹⁾ 5 x 0.75 mm ² ;
KM-08	Primary air	Connection cable ¹⁾ 5 x 0.75 mm ²
KM-09	Lock	Connection cable ¹⁾ 2 x 0.75 mm ²
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 mm ²
KM-13	Lambda probe	Connection cable ¹⁾ 4 x 0.75 mm ² Connection of a Bosch switching-type sensor (type LSM11) or NTK switching-type sensor (type OZA685, item number: 69400)
KM-14	Boiler release	Connection cable ¹⁾ 2 x 0.75 mm ² Caution! The connection must be a floating connection! Boiler enable contact 24 V supply ➡ "Analogue module" [▶ 28]
KM-15	Flue gas temperature sensor	Only use connection cable of the component 24 V supply ➡ "Analogue module" [▶ 28]
KM-16	Door switch	Connection cable ¹⁾ 2 x 0.75 mm ²
KM-17	Sensor 2	Connection cable ¹⁾ 2 x 0.75 mm ²
KM-18	Sensor 1	Connection cable ¹⁾ 2 x 0.75 mm ² , sensor 1 in the STL housing
KM-19	Outside temperature sensor	Connection cable ¹⁾ 2 x 0.75 mm ² , 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	Return feed sensor	Connection cable ¹⁾ 2 x 0.75 mm ²
KM-25	Boiler sensor	
KM-26	PWM / 0-10V pump 1	
KM-27	Induced draught fan	Connection cable ¹⁾ 3 x 1.5 mm ² for power supply, Connection cable ¹⁾ 3 x 0.75 mm ² for analysis of current speed

Connection / Name		Note
KM-28	Pump 1	Connection cable ¹⁾ 3 x 1.5 mm ² , max. 1.5A / 280W / 230V
KM-29	Mains connection	Connection cable ¹⁾ 3 x 1.5 mm ² , fuse provided by customer: C16A
KM-30	Mixing valve heating circuit 2	Connection cable ¹⁾ 4 x 0.75 mm ² , max. 0.15A / 230V
KM-31	Mixing valve heating circuit 1	
KM-32	Heating circuit pump 2	Connection cable ¹⁾ 3 x 1.5 mm ² , 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 mm ² , max. 2A
KM-35	Potential-free contact	Connecting cable ¹⁾ 2 x 0.75 mm ²
KM-36	Optional module	Ignition expansion connection
1. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0881-5		

Fuses

F2	6.3 AT	KM-27, KM-28
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2.1.2 Board view - core module medium (for S-Tronic Plus)



Connection / Name		Note
KM-01	BUS	Connection with cable – LIYCY paired 2x2x0.5; ➡ "Connecting the bus cable" ▶ 31] Caution! CAN L and CAN H must not be connected to +U _{Bus} !
KM-02	BUS	Patch cable CAT 5 RJ45 SFTP 1:1 configuration; pellet module connection
KM-03		
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 update and connection to visualisation software
KM-10	High-limit thermostat	Connection cable ¹⁾ 2 x 0.75 mm ²
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-15	Flue gas temperature sensor	Only use connection cable of the component

Connection / Name		Note
KM-16	Door switch	Connection cable ¹⁾ 2 x 0.75 mm ²
KM-17	Sensor 2	Connection cable ¹⁾ 2 x 0.75 mm ²
KM-18	Sensor 1	Connection cable ¹⁾ 2 x 0.75 mm ² , sensor 1 in the STL housing
KM-19	Outside temperature sensor	Connection cable ¹⁾ 2 x 0.75 mm ² , 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	Return feed sensor	Connection cable ¹⁾ 2 x 0.75 mm ²
KM-25	Boiler sensor	
KM-26	PDM / 0-10V pump 1	
KM-27	Induced draught fan	Connection cable ¹⁾ 3 x 1.5 mm ² for power supply, Connection cable ¹⁾ 3 x 0.75 mm ² for analysis of current speed
KM-28	Pump 1	Connection cable ¹⁾ 3 x 1.5 mm ² , max. 1.5A / 280W / 230V
KM-29	Mains connection	Connection cable ¹⁾ 3 x 1.5 mm ² , fuse provided by customer: C16A
KM-30	Mixing valve heating circuit 2	Connection cable ¹⁾ 4 x 0.75 mm ² , max. 0.15A / 230V
KM-31	Mixing valve heating circuit 1	
KM-32	Heating circuit pump 2	Connection cable ¹⁾ 3 x 1.5 mm ² , 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 mm ² , max. 2A

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

2.1.3 Mains connection

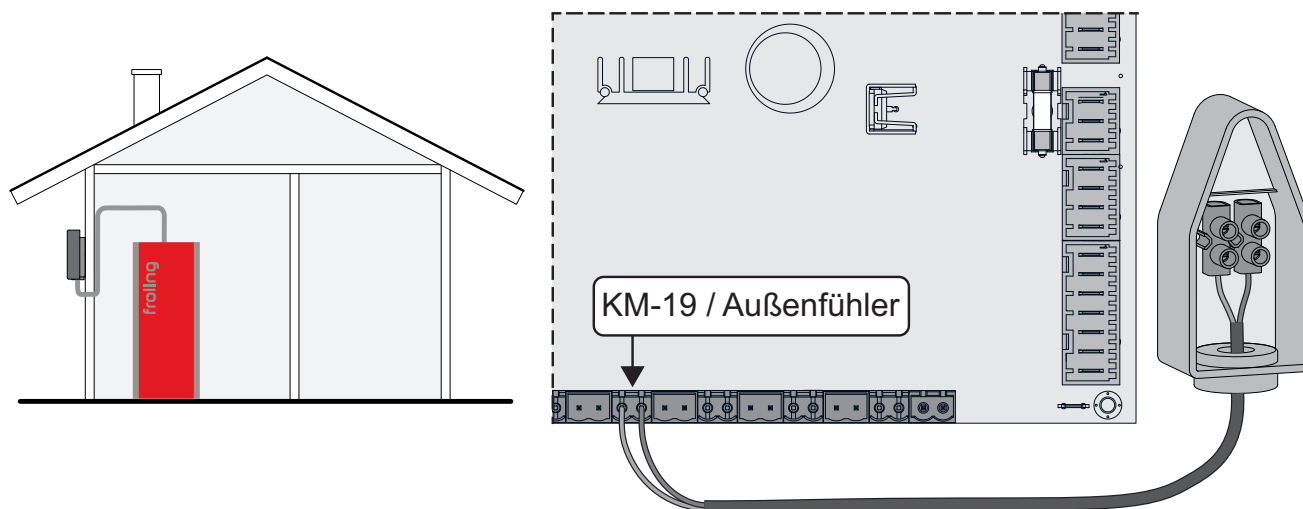
Plug the "Mains connection" plug into the power supply socket.

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

Boiler type	Electric fuses	Fuse type
S3 Turbo	13A	C13A

2.1.4 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.

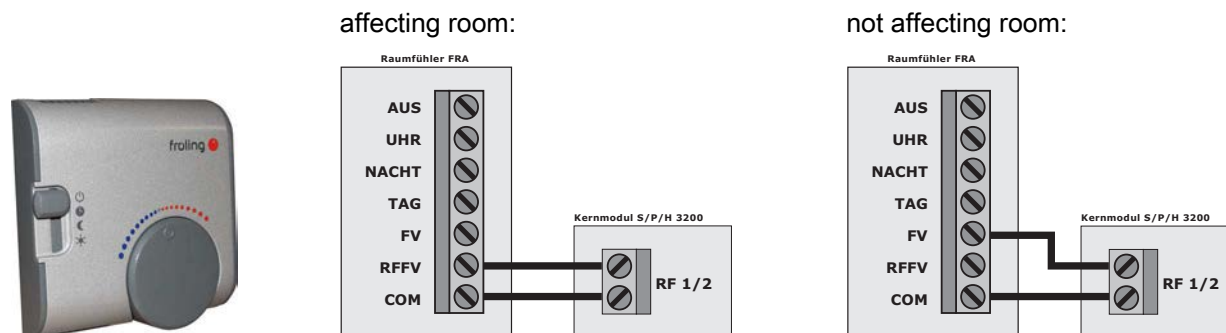


In the delivered state, the outside temperature sensor is read in by the core module ("KM-19 / outside temperature sensor" connection). Alternatively, the outside temperature sensor can be connected to an additional heating circuit module.

➡ "Heating circuit module" ► 17]

2.1.5 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.



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	

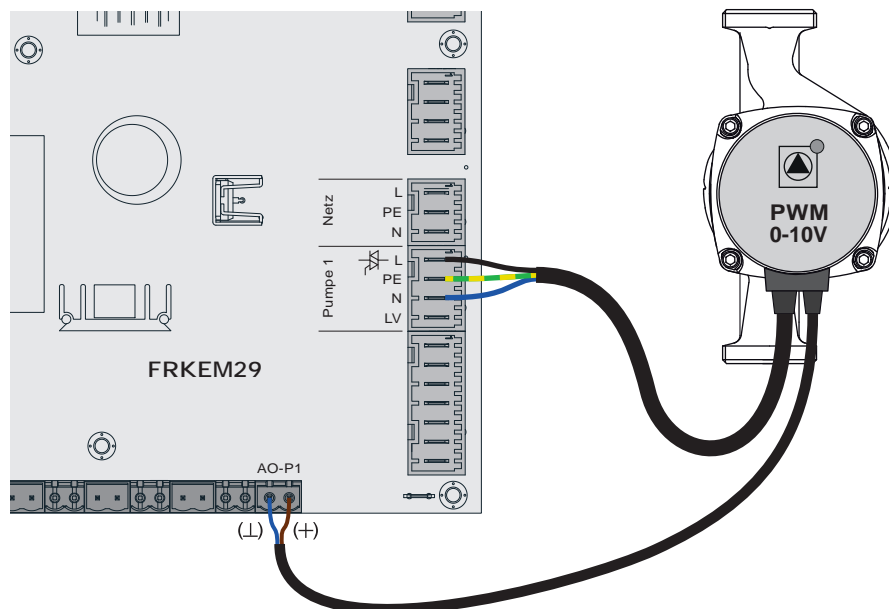
IMPORTANT! Refer to the supplied assembly instructions for more detailed explanations on connecting and operating the FRA room temperature sensor.

2.1.6 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)

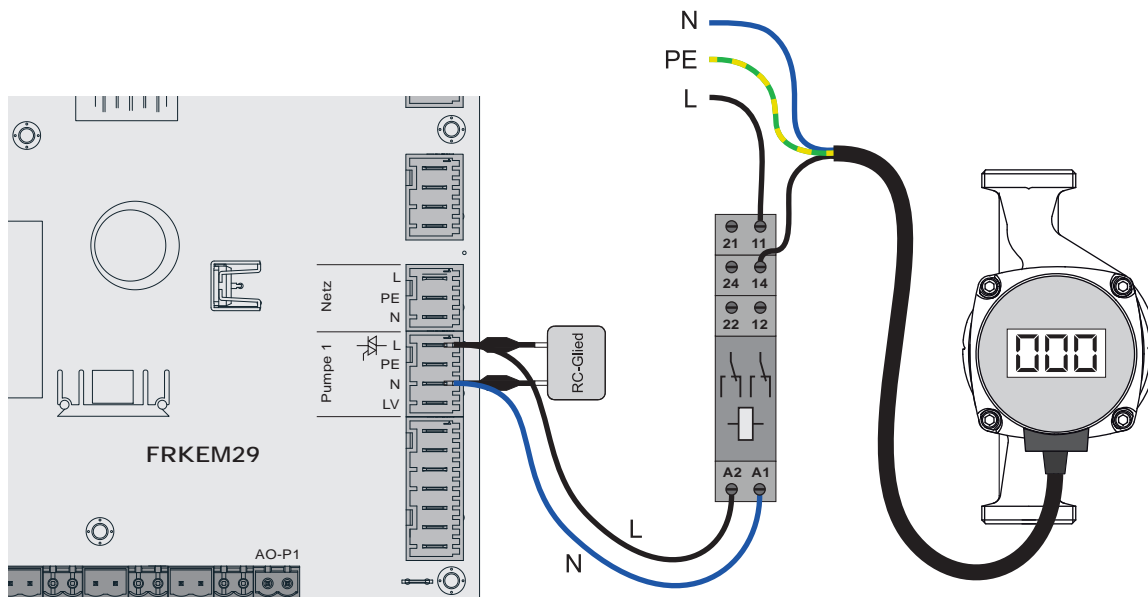
On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PWM or 0-10V signal.



- ☐ 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

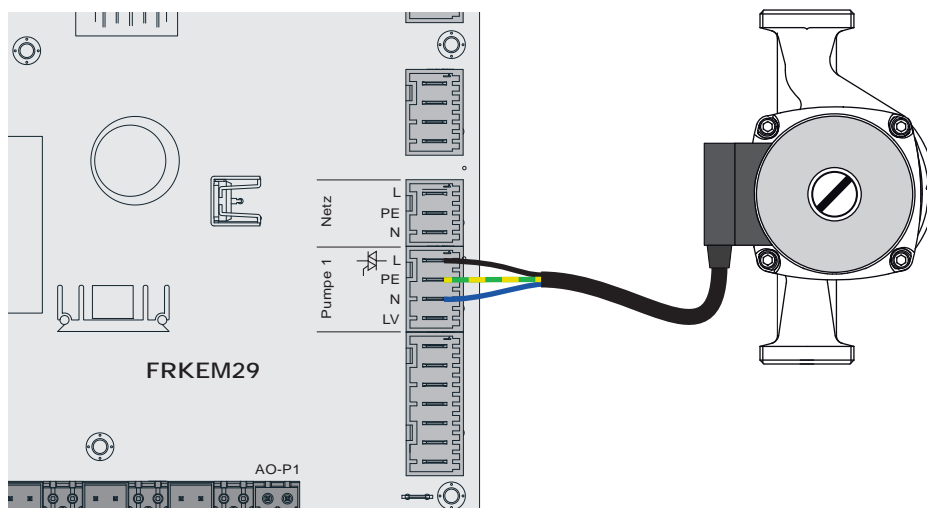
It is not possible to control the speed when using this type of pump. The use of a line regulating valve (e.g.: Setter balancing valve) is recommended.



- ☐ 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%).



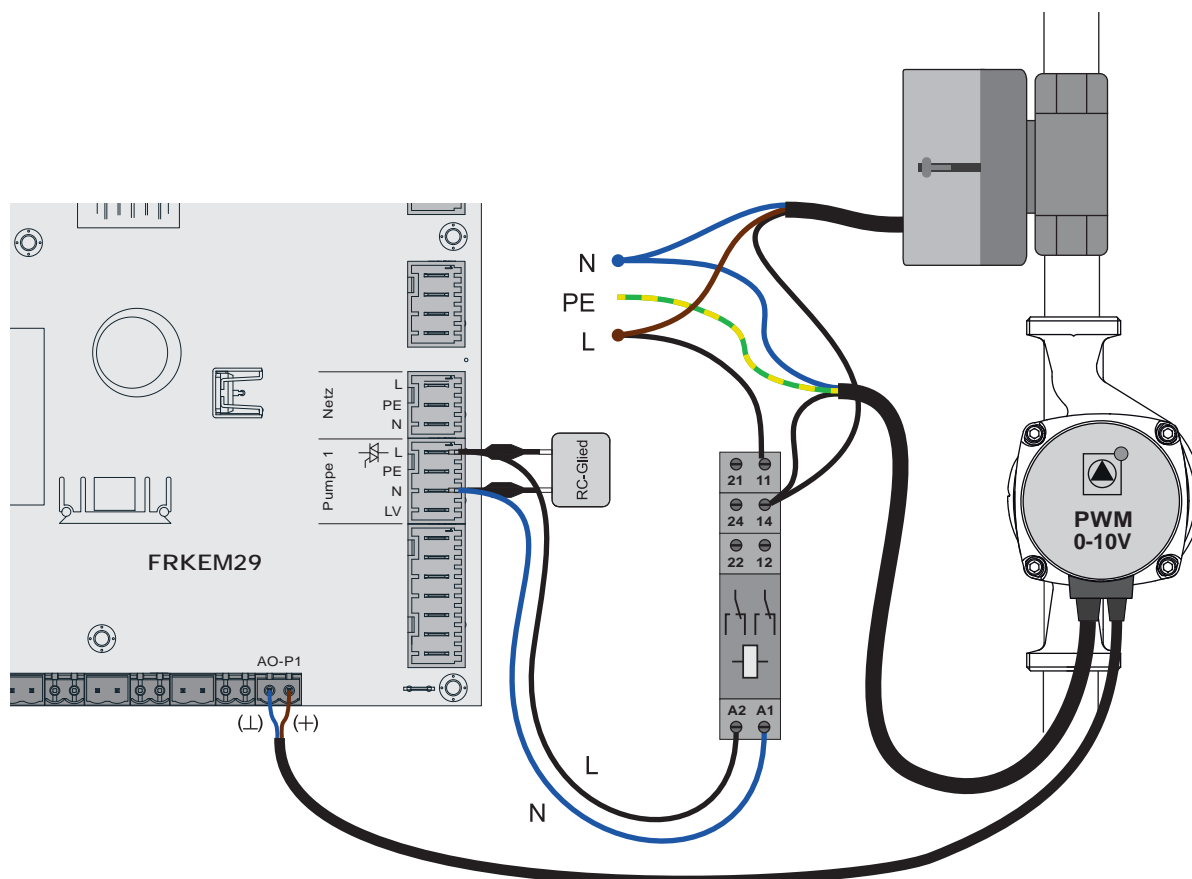
- ☐ Connect pump to output “Pump 1” of the core module
- ☐ In the relevant menu, set the pump control to “Pump without control signal”

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)

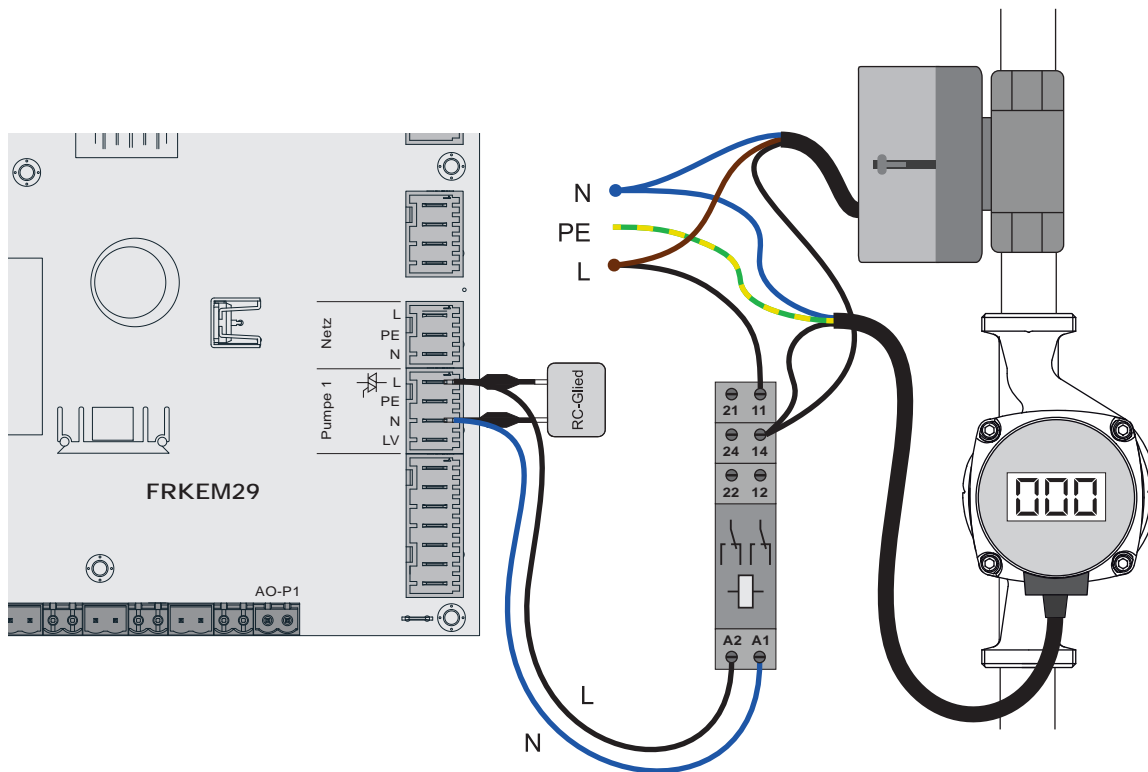
On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PDM or 0-10V signal.



- ☐ 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

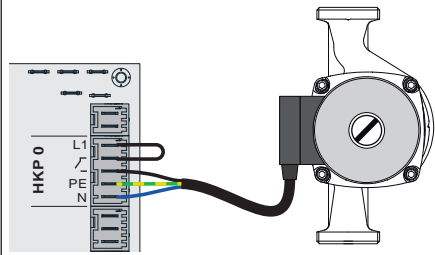
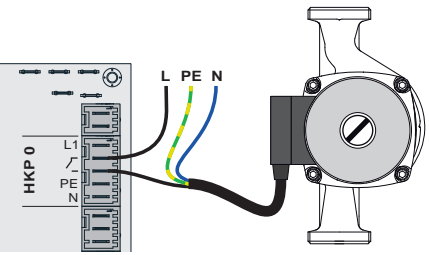
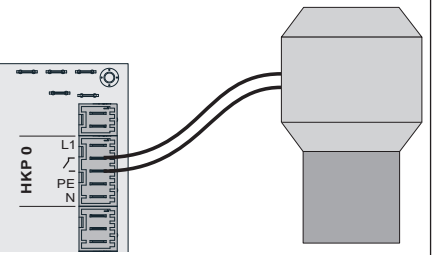
When this type of pump is used, the speed is not controllable! The use of a line regulating valve (e.g.: Setter balancing valve) is recommended!



- ☐ 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:

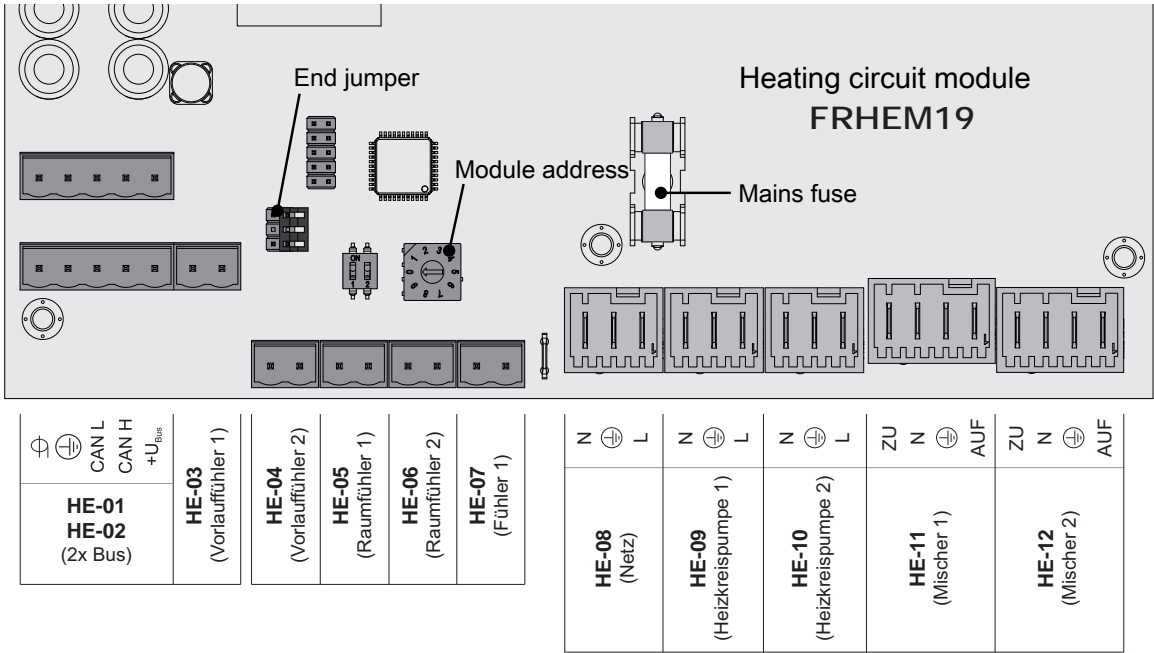
Heating circuit pump 0		Burner relay
		
The pump can be supplied with up to a max. 2 Ampere directly via the output. During this process, phase (L1) of the output is connected to the switch contact.	The pump must be supplied externally with 2 Ampere. Up to max. 5 Ampere, the floating contact can be used 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.

2.2 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" ▶ 32]



Connection / Name		Note
HE-01	BUS	Connection with cable – LIYCY paired 2x2x0.5; ➡ "Connecting the bus cable" ▶ 31] Caution! CAN L and CAN H must not be connected to +U _{BUS} !
HE-02	BUS	

Connection / Name		Note
HE-03	Flow temperature sensor 1	Connection cable ¹⁾ 2 x 0.75 mm ² ;
HE-04	Flow temperature sensor 2	
HE-05	Room temperature sensor 1	Connection cable ¹⁾ 2 x 0.75 mm ² ; 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 mm ² ; 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
HE-08	Mains	Connection cable ¹⁾ 3 x 1.5 mm ² , fuse 10A
HE-09	Heating circuit pump 1	Connection cable ¹⁾ 3 x 1.5 mm ² , max. 2.5A / 230V / 500W
HE-10	Heating circuit pump 2	
HE-11	Mixing valve 1	Connection cable ¹⁾ 4 x 0.75 mm ² , 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
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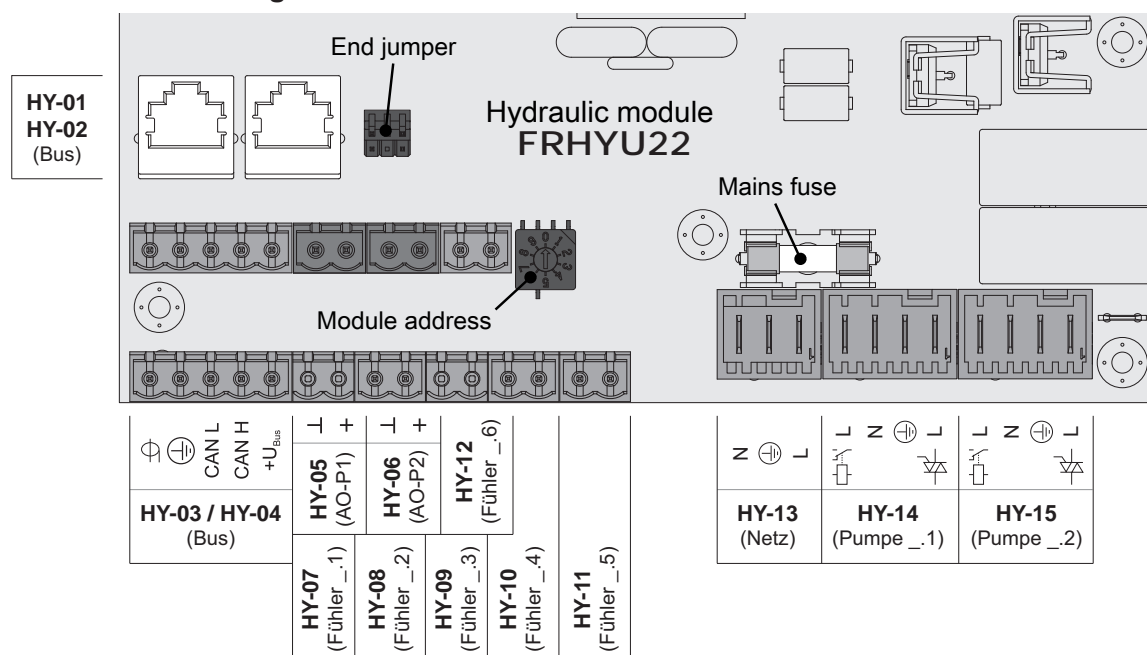
2.2.2 Hydraulic module

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

There is **NO** hydraulic module included in the scope of supply. Expansion can include up to eight hydraulic modules (address 0 to 7).

You must ensure that the module address is assigned correctly! ➔ ["Setting the module address" \[32\]](#)

Hydraulic module starting with version FRHYU22



Connection / Name		Note
HY-01	BUS	Patch cable CAT 5 RJ45 SFTP 1:1 configuration;
HY-02	BUS	
HY-03	BUS	Connection with cable – LIYCY paired 2x2x0.5; ➔ "Connecting the bus cable" [31] Caution! CAN L and CAN H must not be connected to +U _{BUS} !
HY-04	BUS	
HY-05	AO-P1	Connection cable ¹⁾ 2 x 0.75 mm ² Connection of control signal for relevant pump
HY-06	AO-P2	
HY-07	Sensor _1	Connection cable ¹⁾ 2 x 0.75 mm ² , 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-12	Sensor _6	
HY-13	Mains	
HY-14	Pump _1	
HY-15	Pump _2	Connection cable ¹⁾ 3 x 1.5 mm ² , fuse 10A Connection cable ¹⁾ 3 x 1.5 mm ² , 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. Connecting a circulating pump to the hydraulic module

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

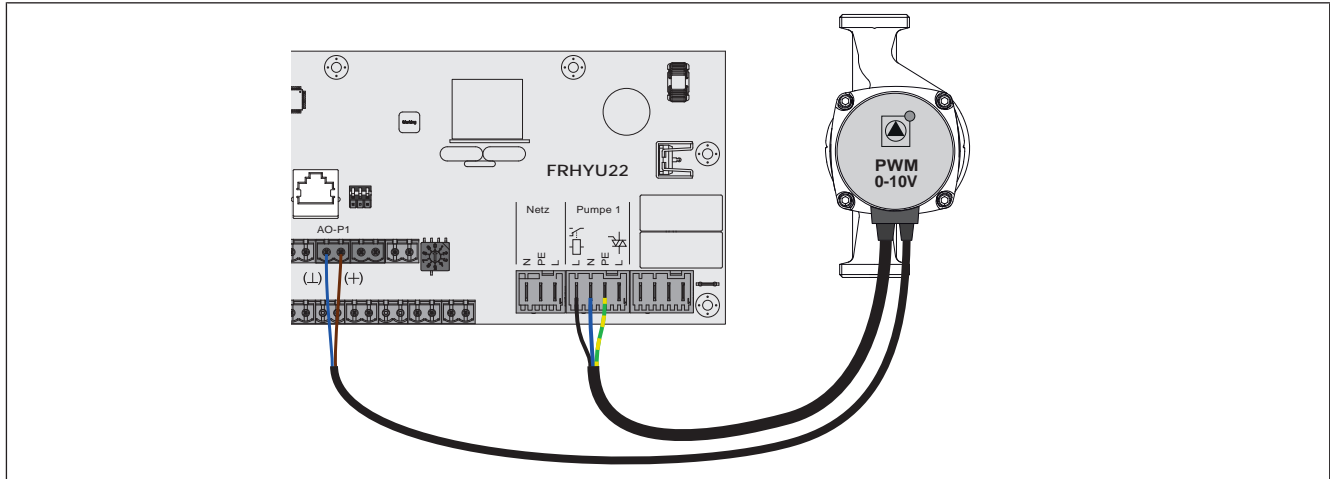
Fuses

F1	6.3 AT	HY-14, HY-15
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Connecting a circulating pump to the hydraulic module

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

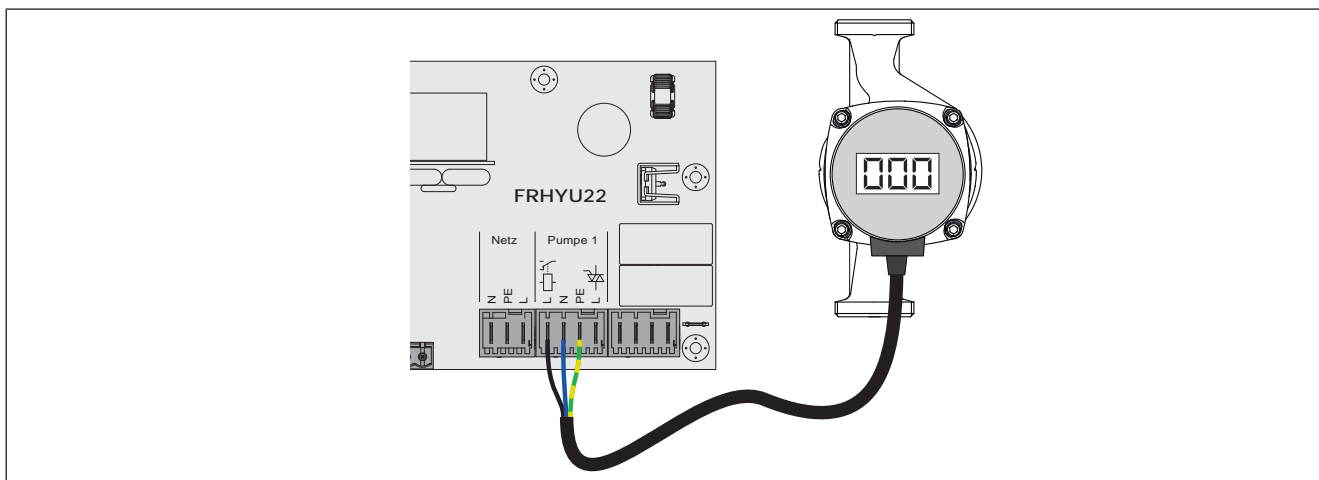
On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PDM or 0-10V signal.



- ☐ 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

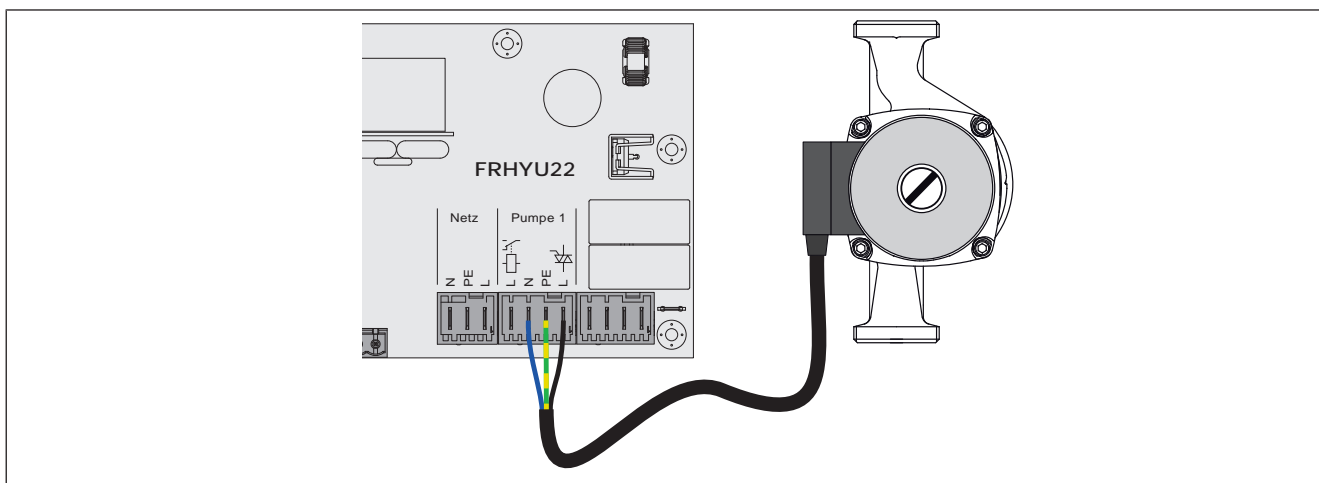
When this type of pump is used, the speed is not controllable! The use of a line regulating valve (e.g.: Setter balancing valve) is recommended!



- ☐ 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)

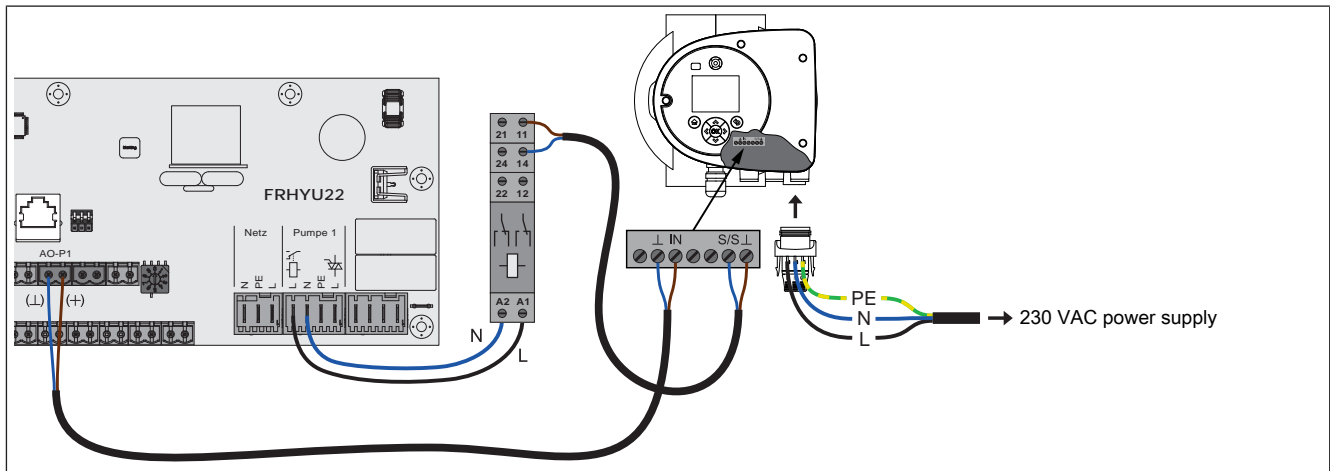
On older pumps without a control signal that are not highly efficient, the speed control is implemented via a pulse package control. Please note that the minimum speed may need to be adjusted on some pumps (default setting: 30%).



- ☐ 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.



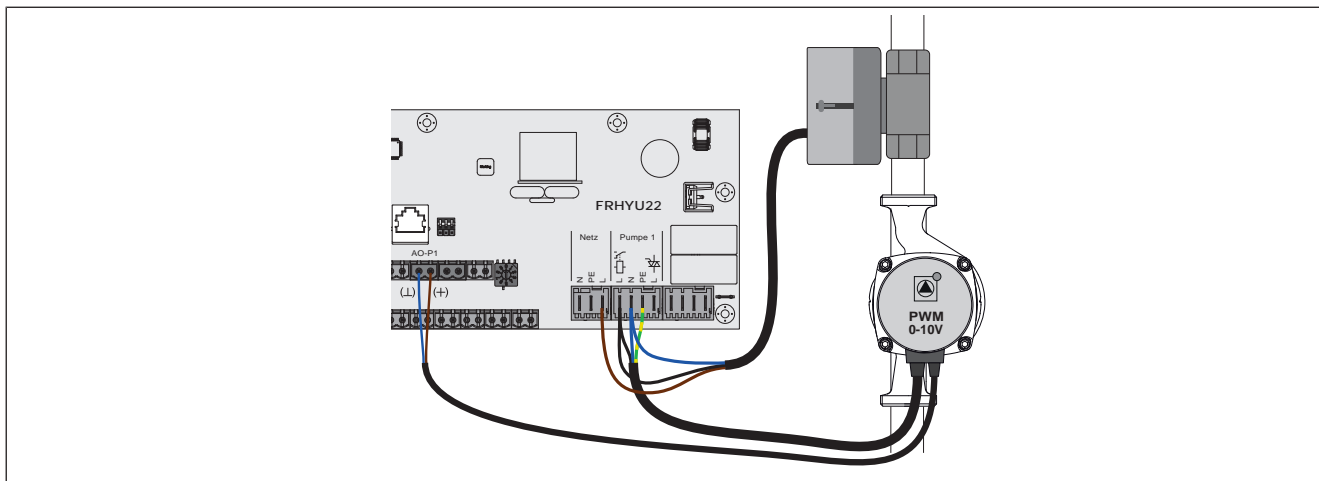
- ☐ Connect the pump relay to output “Pump 1” or “Pump 2” and use the relay output for phase (L)
- ☐ Install and connect two-pole cable (2 x 0.75 mm²) from connection “AO-P1” or “AO-P2” to the pump and connect terminal “+” with terminal “IN” of the pump
- ☐ Install and connect two-pole cable (2 x 0.75 mm²) 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)

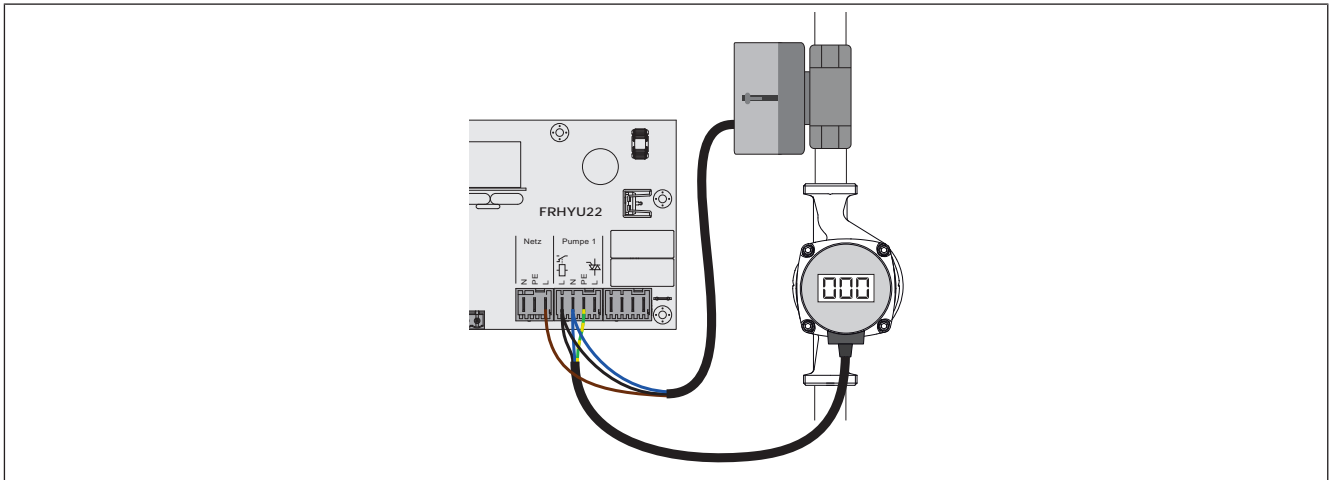
On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PDM or 0-10V signal.



- ☐ 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”

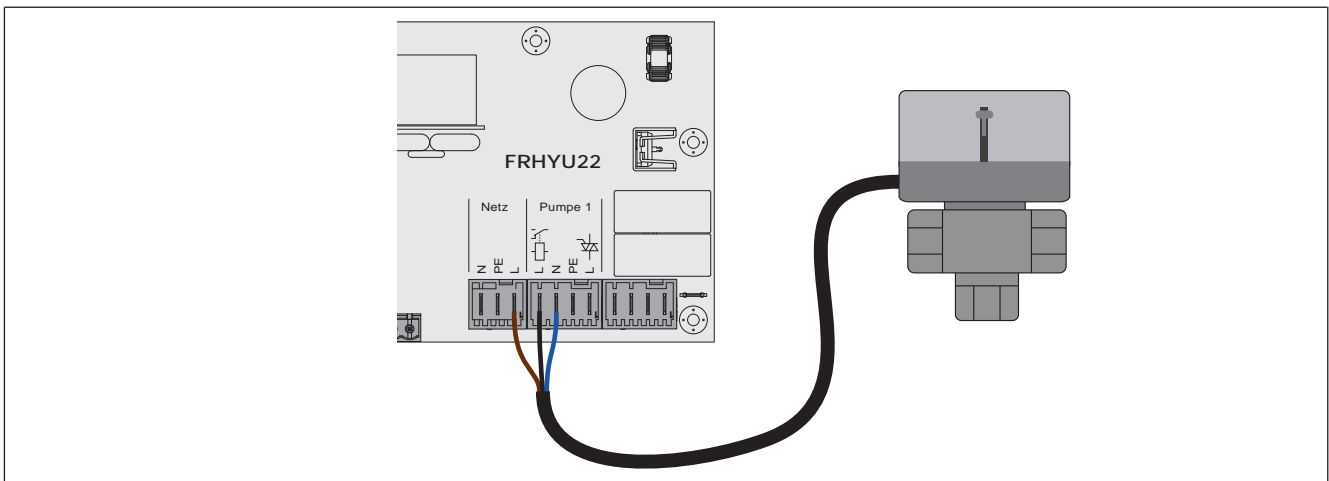
High efficiency pump without control signal

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"

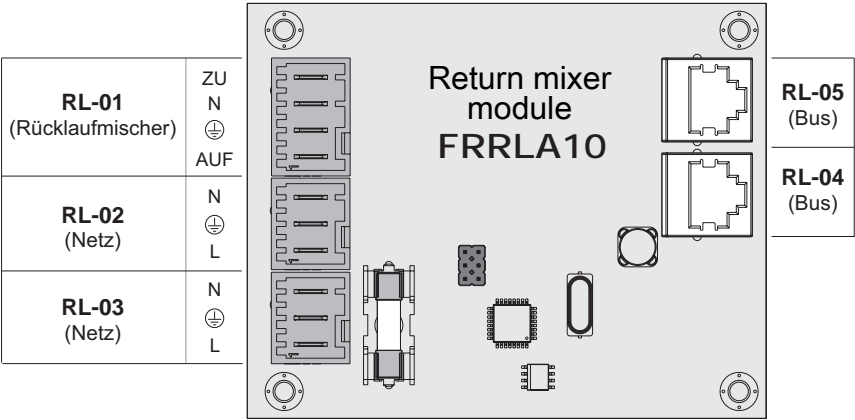
Connecting an isolating valve to the hydraulic module



- ☐ 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 Return mixer module

The return mixer module provides the connection for a return mixer. The relevant sensor is the return feed sensor on the core module. If this module is used, the "Return mixer through external mixer module" parameter ("System selection" menu => "Boiler type") must be set to "YES".



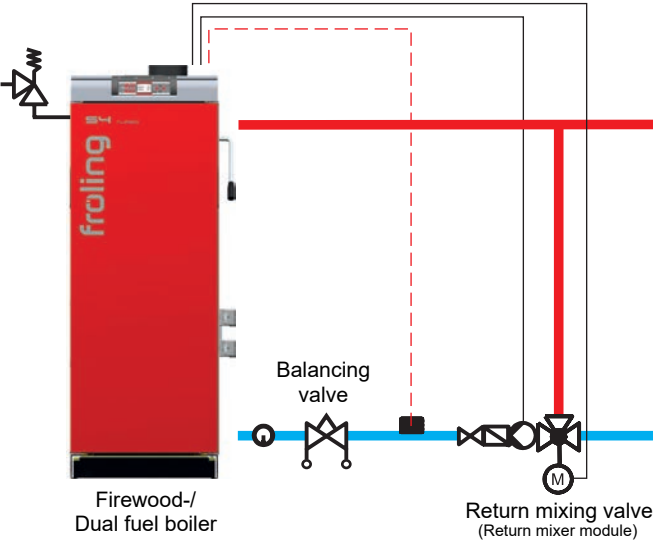
Connection / Name		Note
RL-01	Return mixer	Connection cable ¹⁾ 4 x 0.75 mm ² , max. 0.15A / 230V
RL-02	Mains	Connection cable ¹⁾ 3 x 1.5 mm ²
RL-03	Mains	
RL-04	Bus	Patch cable CAT 5 RJ45 SFTP 1:1 configuration, included in delivery
RL-05	Bus	

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

Fuses

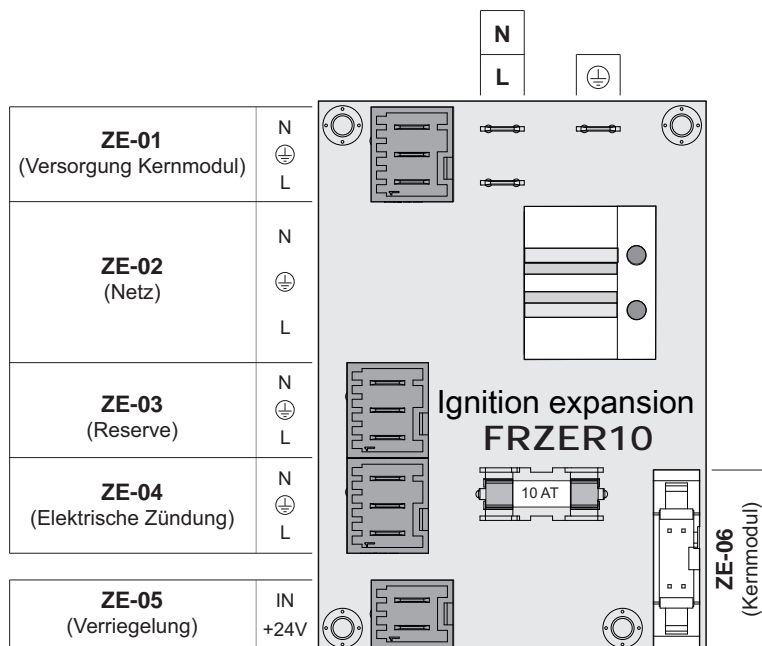
F1	6.3 AT	RL-01
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Connection example



2.2.4 Ignition expansion

The ignition expansion makes provision for the connection of an electric ignition fan, thereby allowing the boiler to be heated up automatically. The power supply of the ignition expansion must be established using the supplied cable between the terminal block and the “ZE-01 core module power supply” connection.



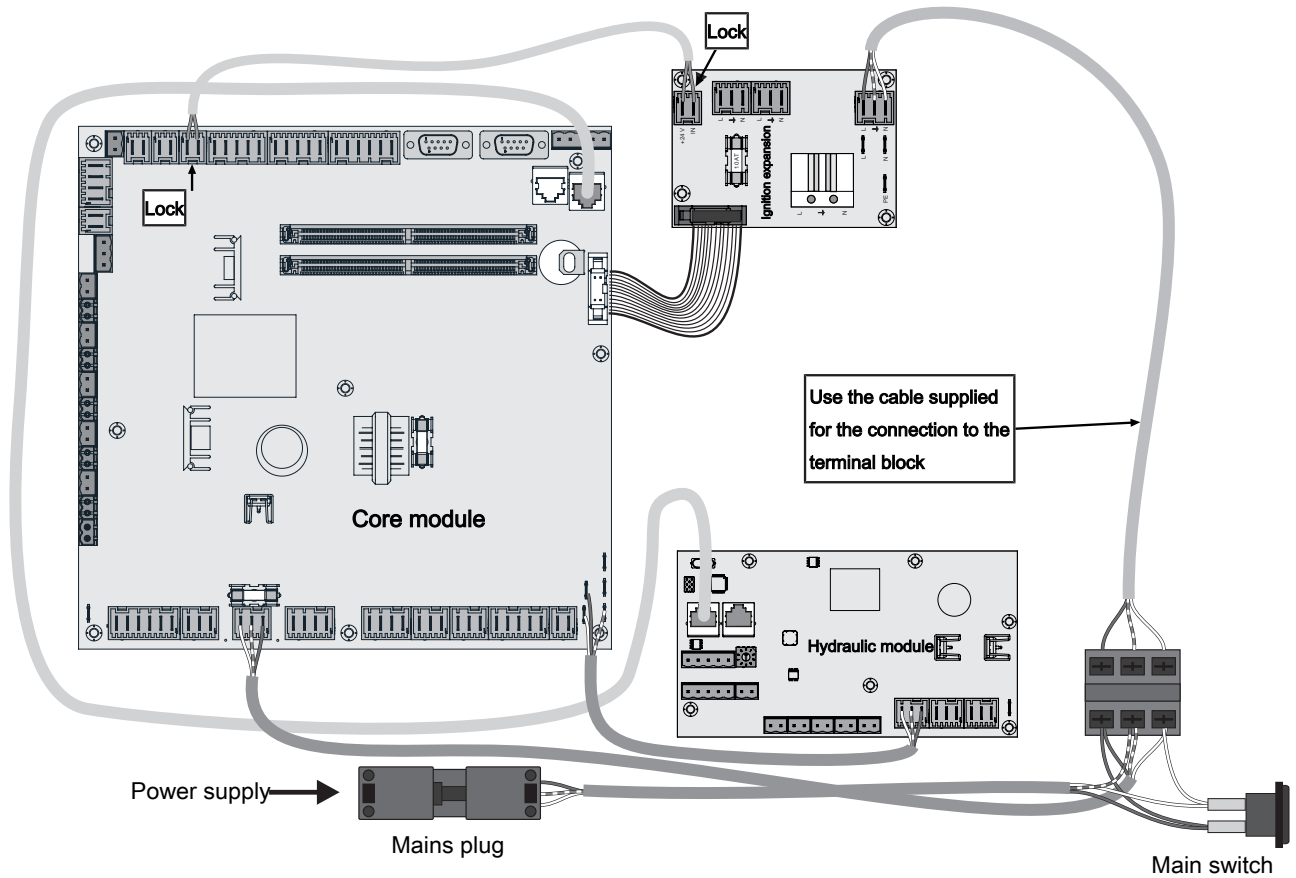
Connection / Name		Note
ZE-01	Core module power supply	Connection cable ¹⁾ 3 x 1.5 mm ²
ZE-02	Mains	Connection cable ¹⁾ 3 x 1.5 mm ²
ZE-03	Reserve	
ZE-04	Electric ignition	Connection cable ¹⁾ 3 x 1.5 mm ²
ZE-05	Lock	Connection cable ¹⁾ 2 x 0.75 mm ² , 24V looped through
ZE-06	Core module	Use the ribbon cable supplied

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

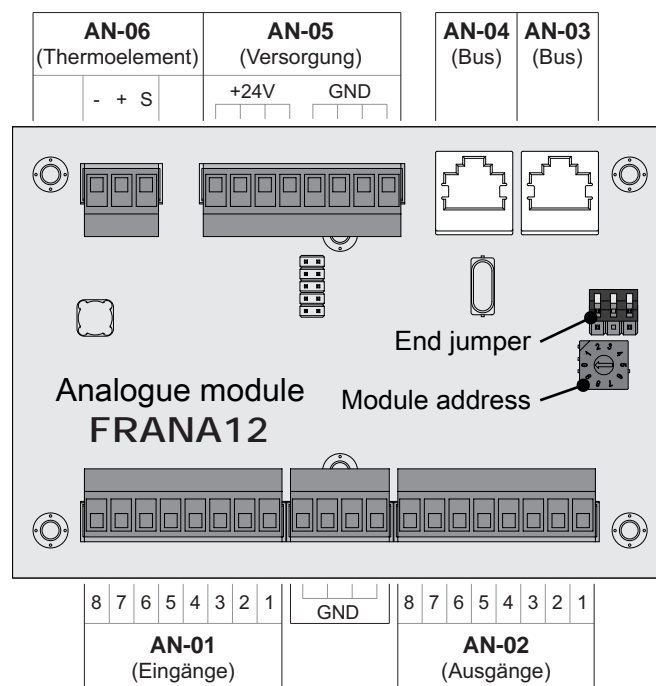
Fuses

F1	10 AT	ZE-04
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Connection diagram



2.2.5 Analogue module



Connection / Name		Note
AN-01	Inputs 1...8	Connection cable ¹⁾ 1 x 0.75 mm ²
AN-02	Outputs 1...8	Connection cable ¹⁾ 1 x 0.75 mm ²
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 mm ² - 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 0

Input	Designation
3	External power specification (0-10V)

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 a firewood boiler

The demand works on firewood boilers with an automatic ignition. If the signal at the input is above 75%, the automatic ignition is enabled (prerequisite: ignition is started via external release). The minimum output of the modulation area is limited. If the signal falls below 70% (0-69%), the boiler is activated at a boiler output of 70% until the firewood has burnt 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).

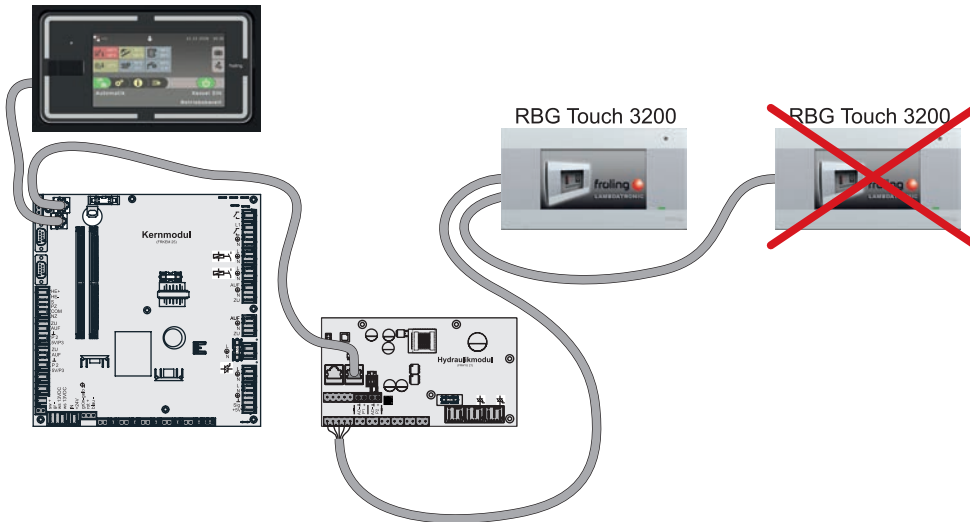
Necessary parameters for setting the power demand can be found in the "*Boiler – General settings*" menu.

2.3 BUS connection

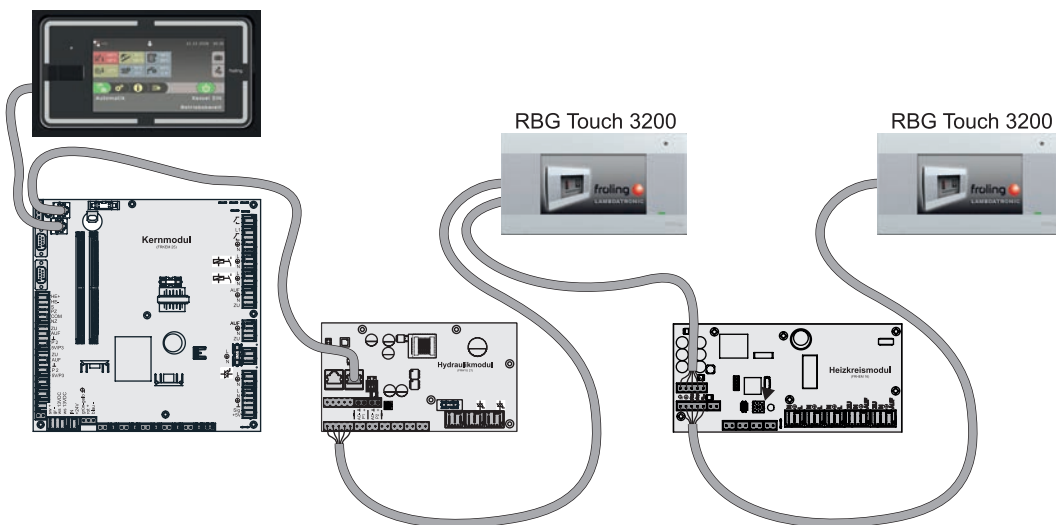
All of the bus models are connected with a bus line. The specification of the cable that is used must adhere to the LIYCY 2x2x0.5 type. A maximum cable length of 200 m must be observed. The cable length can be extended using the Fröling bus repeater.

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.

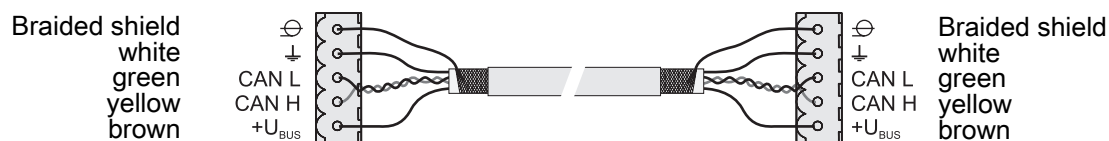


A voltage supply unit must be used for every touch room console (heating circuit module, hydraulic module).



2.3.1 Connecting the bus cable

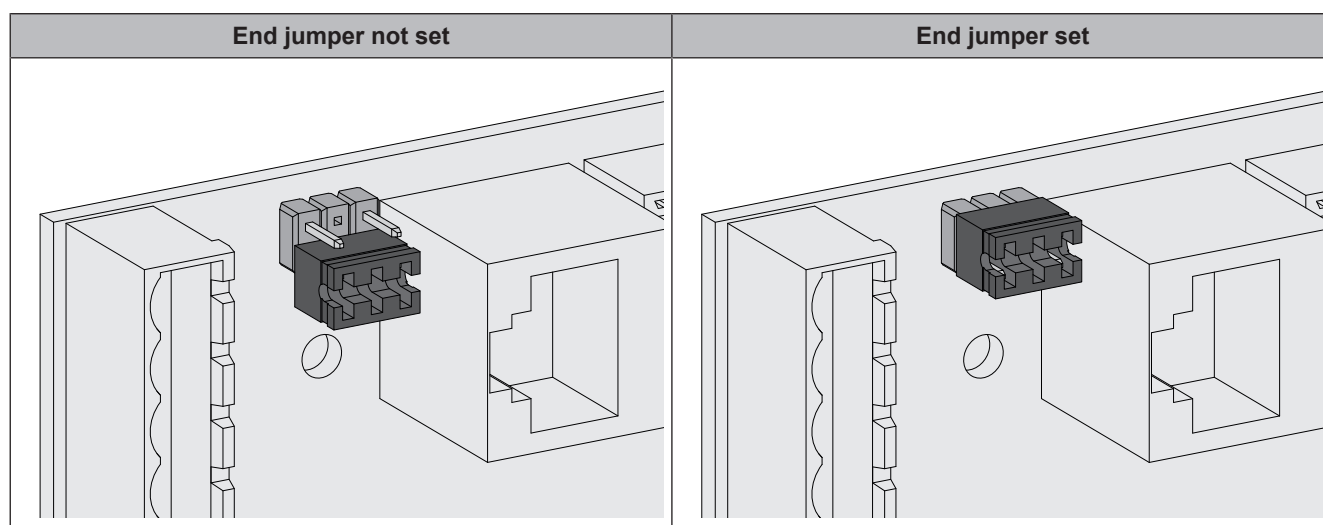
For the bus connections between the individual modules, cable type **LIYCY paired 2x2x0.5** should be used. The connection to the 5-pin plugs should be carried out according to the following diagram:



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.



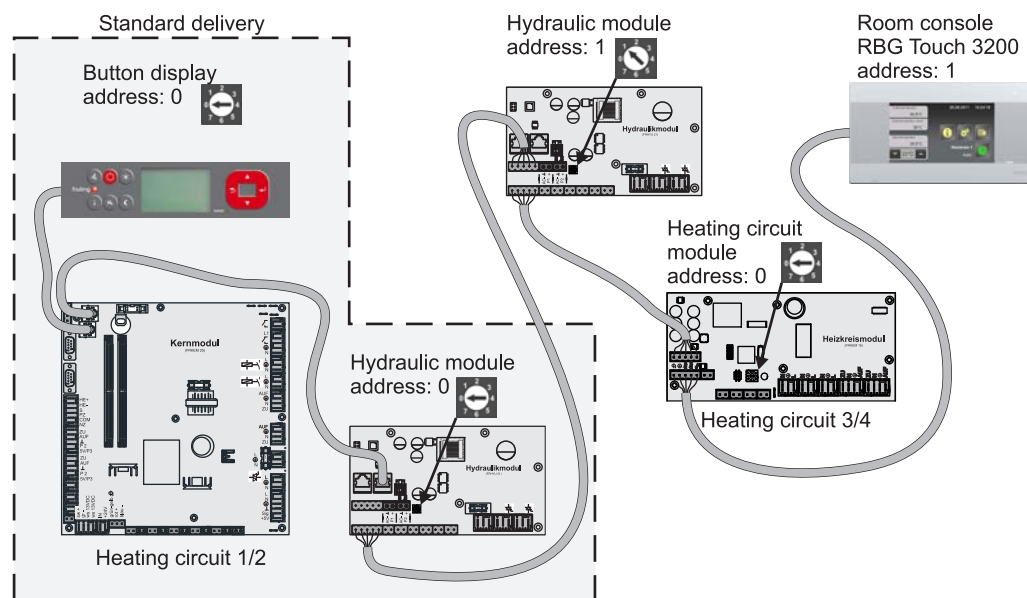
If the contacts at the base of the end jumper are not bridged (image left), it is referred to as "not set". In this case there is no bus termination. If the contacts are closed (image right), the end jumper is set and the bus connection is terminated.

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.

There is **NO** hydraulic module included in the scope of supply. Expansion can include up to eight hydraulic modules (addresses 0 to 7).

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

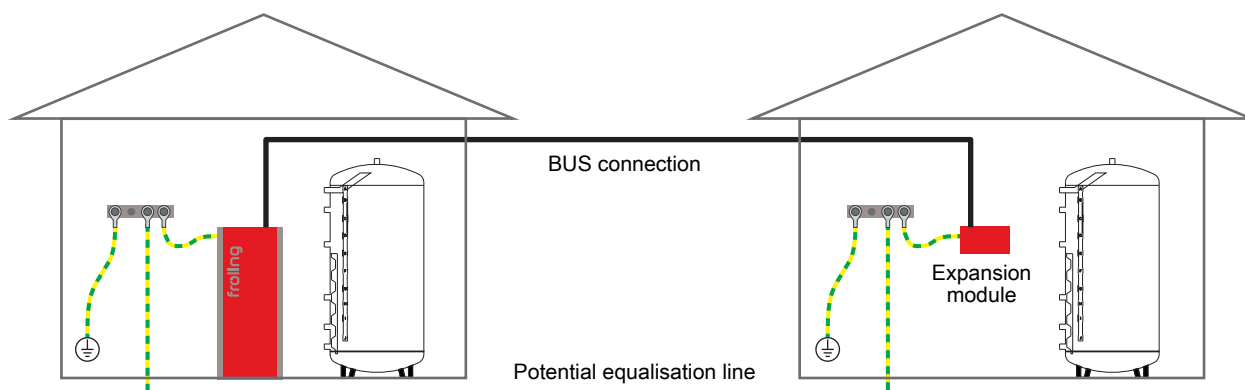


Module address set	Heating circuit module	Hydraulic module	
	Heating circuit	Sensors	Pump
0	03 – 04	0.1 – 0.6	0.1 – 0.2
1	05 – 06	1.1 – 1.6	1.1 – 1.2
2	07 – 08	2.1 – 2.6	2.1 – 2.2
3	09 – 10	3.1 – 3.6	3.1 – 3.2
4	11 – 12	4.1 – 4.6	4.1 – 4.2
5	13 – 14	5.1 – 5.6	5.1 – 5.2
6	15 – 16	6.1 – 6.6	6.1 – 6.2
7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

2.3.4 Potential equalisation / potential separation

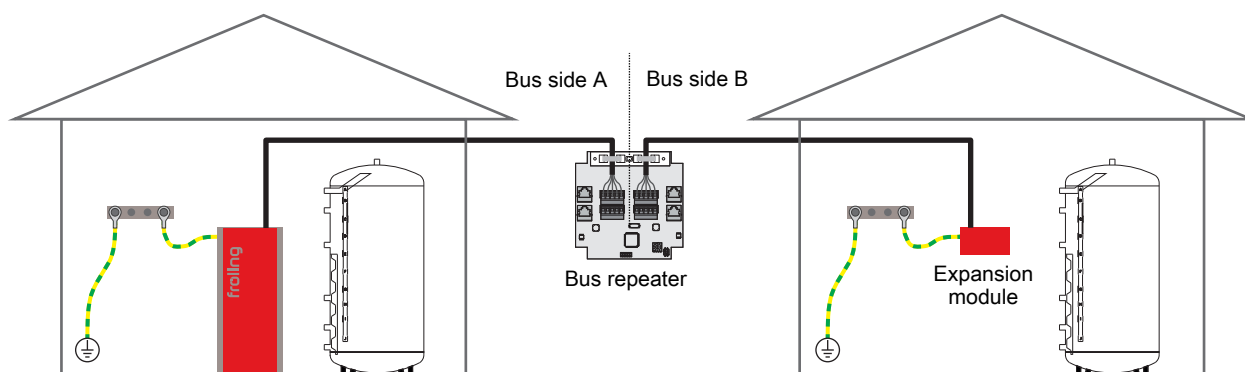
There can be potential shifts between buildings. In this case, equalising currents flow via the bus connection shield which can damage the modules.

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.

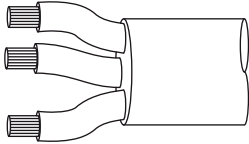
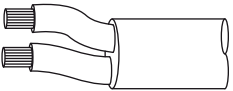
Instead of the potential equalisation, a Fröling bus repeater can be used in the bus connection line to the next building. The potential separation (galvanic isolation) allows the bus network to be split into two separate sub-networks.



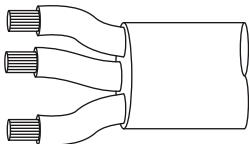
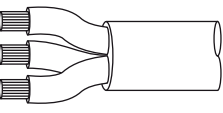
2.4 Connection information according to pump types

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:

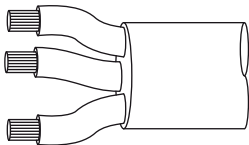
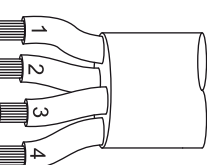
Pump type with 2-pin control cable

Power supply	2-pin control cable
(brown) L  (blue) N (yellow/green) PE	(blue) ⊥  (brown) +
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

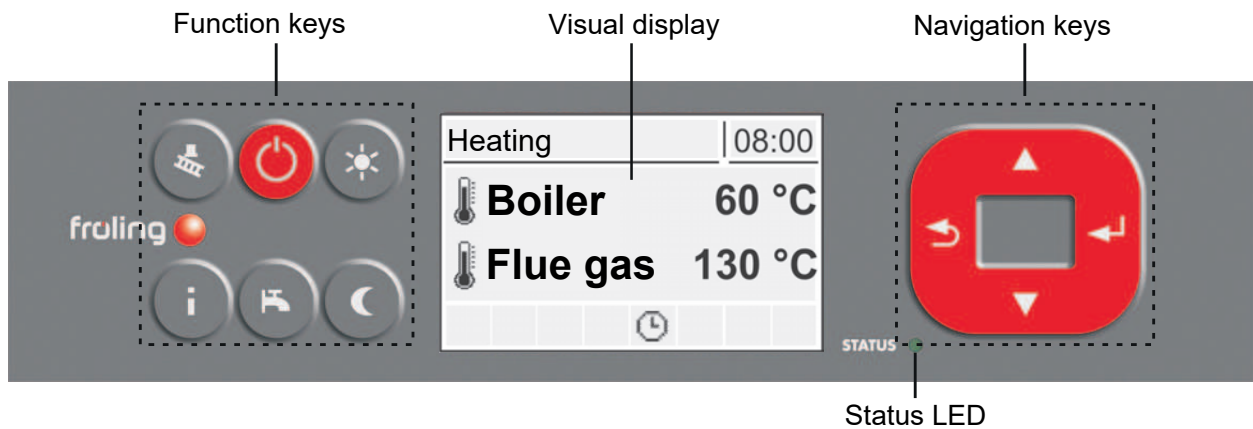
Power supply	3-pin control cable
(brown) L  (blue) N (yellow/green) PE	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> PWM </div> <div style="margin-right: 10px;"> (blue) ⊥ (brown) + (black) </div>  </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px; margin-left: 10px;"> not used </div>
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
(brown) L  (blue) N (yellow/green) PE	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> PWM </div> <div style="margin-right: 10px;"> (brown) ⊥ (white) + (blue) (black) </div>  </div> <div style="border: 1px solid black; padding: 5px; margin-top: 5px; margin-left: 10px;"> not used </div>
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





3 Overview of the basic functions

3.1 Control keys and display



3.1.1 Navigation keys

The navigation keys are used to move within the menu and to change parameter values.

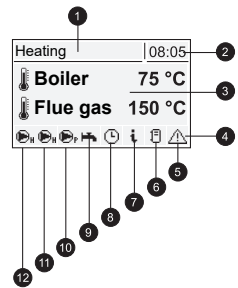
Key	Function for	
 UP arrow	navigation: move up a menu level	
	parameter change:	depending on how long the key is pressed: <ul style="list-style-type: none"> - short: increase value - long: increase value in increments of 10 - long (>10 secs): increase value in increments of 100
 DOWN arrow	navigation: move down a menu level	
	parameter change:	depending on how long the key is pressed: <ul style="list-style-type: none"> - short: reduce value - long: reduce value in increments of 10 - long (>10 secs): reduce value in increments of 100
 Enter key	navigation: go to selected menu	
	parameter change:	release the parameter for editing, or save parameter value after changing
 Back key	navigation: go back up a menu level	
	parameter change:	depending on how long the key is pressed: <ul style="list-style-type: none"> - short: do not save parameter - long: back to basic display without saving

3.1.2 Status LED

The status LED shows the operating status of the system:

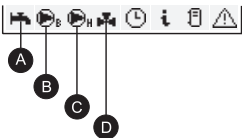
- GREEN flashing (interval: 5 sec OFF, 1 sec ON): Off
- GREEN constant: **BOILER SWITCHED ON**
- ORANGE flashing: **WARNING**
- RED flashing: **FAULT**

3.1.3 Graphic display



Ref.	Description	
1	Shows operating status or menu name	
2	Shows the current time	
3	Displays the main values in the basic display (adjustable) menu contents, parameters and info texts	
4	Status toolbar	
5	Displayed when a fault is pending. Press the info key to display texts describing the fault and the solution	
6	Shows the storage tank loading status (storage tank is optional)	
7	Indicates that an info text is displayed. Info texts are also identified by a frame	
8	Shows which function is active ➡ "Function keys" [▶ 37]	
9	Shows that the DHW tank loading pump is active	Only shown in the basic display !
10	Shows that the storage tank loading pump is active	
11	Shows that the heating circuit pump of the 2nd heating circuit is active	
12	Shows that the heating circuit pump of the 1st heating circuit is active	

In the service technician user level, the function of the relevant components is also shown in the individual status menus by the corresponding status display:



Ref.	Description	
A	Shows whether the storage tank (or oil boiler) is hot enough for hot water preparation	Only for service technicians in the status menus
B	Shown when the DHW tank or return temperature control pump is active	
C	Shown when the heating circuit or storage tank loading pump is active	
D	Shows the status of the heating circuit mixer	


3.2 Function keys

The function keys of the key control partially have dual functions. Short or long pressing of the keys can access different functions (see below):

short keystroke < 1 sec

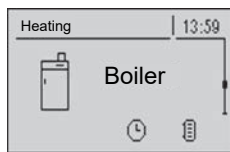
long keystroke > 4 sec

3.2.1 Info key

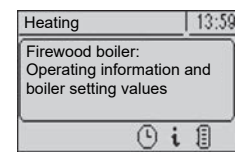
Keystroke		Function
	short	Shows plain text information about the menu items or fault messages
	long	Choose language: Deutsch, English, Francais, Italiano, Slovenski, Cesky, Polski, Svenska, Espanol, Magyar, Suomi, Dansk, Nederlands, Russian, Serbian

The info key can be pressed at any time and always shows information about the current menu item or the current fault message. Fault messages take highest priority.

Info key in normal mode:

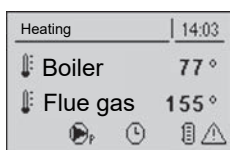


In normal operation (without pending fault messages) the info key can be pressed to display information or an explanation for every menu item or parameter.

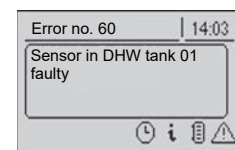


The info text is also identified by the frame and the info symbol in the status line.

Info key when there is a pending fault:



If a fault has been acknowledged after arising, but not resolved, this is shown by a warning symbol at the bottom right on the status line.




Pressing the info key calls up the information on the currently pending fault message again.


Procedure for troubleshooting:

➔ "Troubleshooting" [► 94]


3.2.2 Service program key

Keystroke		Function
	short	The chimney sweep function is used for measuring boiler emissions using the chimney sweeper. For further information and the procedure for measuring emissions, see the operating instructions of the boiler and/or the "Instructions for the procedure for measuring emissions for the firewood boiler".
	long	Function not used


3.2.3 Standby key

Keystroke		Function
	short / long	<p>The currently set mode is activated.</p> <p>By pressing the standby key, the message "BOILER ON" appears on the display. In addition, the currently set or activated mode ("automatic" or "domestic hot water") is displayed in the second line.</p> <p>➡ "System - Boiler mode" [► 91]</p> <p>Mode remains active until another function/mode is pressed or selected.</p>


3.2.4 DHW tank program key

Keystroke		Function
	short	<p>Single manual loading of domestic hot water.</p> <p>The function is indicated during DHW tank loading by the tap symbol in the status line. After loading, the mode that was previously set becomes active again.</p>
	long	<p>To switch the boiler mode.</p> <p>Pressing and holding the water tap key takes you directly to the parameter "Boiler mode". After selecting the desired mode, the boiler remains in the selected mode until the parameter is changed.</p> <p>➡ "System - Boiler mode" [► 91]</p>

3.2.5 Party program key

Keystroke		Function
	short	<p>To activate party mode on the room console.</p> <p>Caution: Function only possible on the room console!</p> <p>After an optional change to the room temperature setpoint, the heating circuit controller remains in heating mode until the end of the next heating period or another mode is activated. This function is not possible in summer mode!</p> <p>Observe the additional information in the operating instructions of the room console.</p>
	Long	<p>During extra heating, heating and domestic hot water are heated for 6 hours. The mode setting is ignored. The function is indicated by the sun symbol in the status line.</p> <p>Caution: The external temperature heating limit set in the "Heating" menu is active and can prevent release of the heating circuits.</p>

3.2.6 Setback program key

Keystroke		Function
	short	<p>To activate setback mode on the room console.</p> <p>Caution: Function only possible on the room console!</p> <p>After an optional change to the setback temperature the heating circuit controller remains in setback mode until the start of the next heating time or until activation of another mode.</p> <p>Observe the additional information in the operating instructions of the room console.</p>
	Long	<p>To activate continuous setback mode on the room console.</p> <p>Caution: Function only possible on the room console!</p> <p>The room temperature is reduced to the preset setback temperature until automatic mode is activated.</p> <p>Observe the additional information in the operating instructions of the room console.</p>

4 Operation

- ☐ Before the initial startup check the wiring of the pumps and mixing valves is correct.
- ☐ Check that the connected components have maximum connected load

4.1 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.

4.1.1 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...)

4.1.2 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

4.1.3 System check

- ☐ Check that the main fuse for the boiler has a sufficient rated amperage
- ➡ "Mains connection" [► 10]

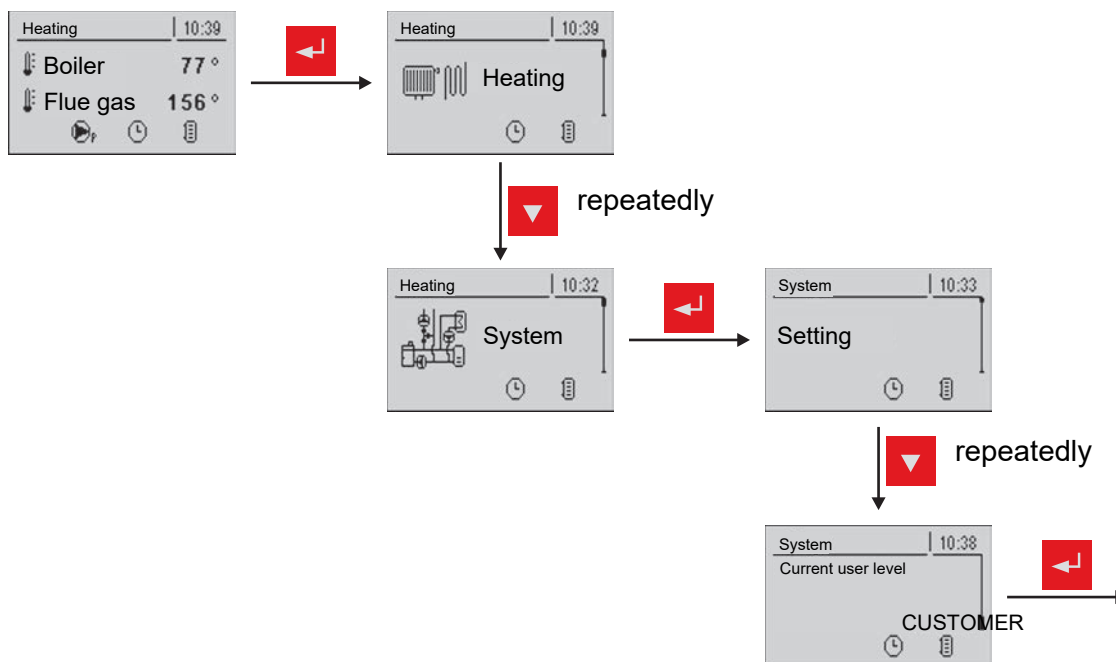
4.2 Initial startup

After power up and when the main switch has been switched on, the start logo is displayed and the controller carries out a system check.

After the system check the basic display is shown. The basic display is shown as standard, giving information about the two most important parameters. The display can be adjusted individually.

4.2.1 Changing the operating level

For safety reasons individual parameters are only visible at specific operating levels. To change to another level, it is necessary to enter the relevant user code:



Child lock (Code "0")

At "Child lock" level, only the "Status" menu appears. It is not possible to change parameters at this level.

Customer (Code "1")

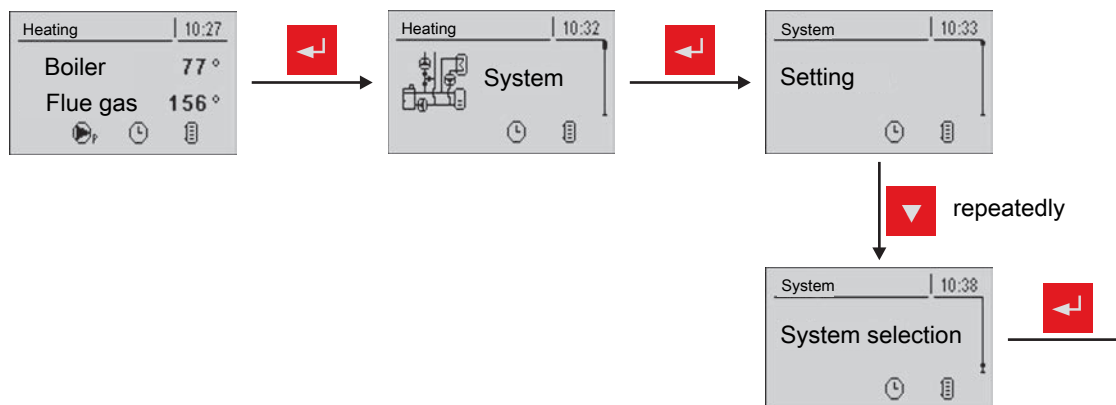
Standard user level for normal operation of the display. All customer-specific parameters are displayed and can be changed.

Installer / Service

Releases parameters to adjust the controller to the system components (if configured).

4.2.2 Setting the system type

NOTICE! Only for trained personnel - service code must be entered.



Boiler type

☐ In the “Boiler type” menu, select the correct option and activate the output and relevant boiler type parameter

⚠ **Warning! Incorrect settings can lead to faults.**

- S1 Turbo
- S3 Turbo
- S4 Turbo
- S4e Turbo

☐ After selecting the actual output, the boiler specified values must be adopted

⚠ Confirm the pop-up that appears with “YES”.

The boiler type parameters listed below depend on the boiler type selection previously made and must be activated according to the system configuration.

Lambda probe installed



If a Lambda probe is installed (Bosch, NTK, LSM11) then this parameter must be activated.
NOTE: This parameter is not available on boiler types SP Dual compact and T4.

Actuators installed

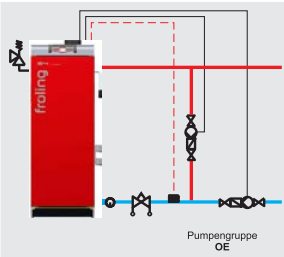


If two actuators are installed for air control on the boiler, then this parameter must be activated.

Ignition type

Indicates which automatic ignition is being used.

Bypass pump installed



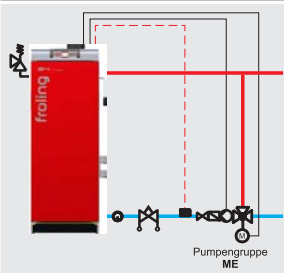
If the return temperature control is by way of bypass pump, then this parameter must be activated.

Return sensor connection: Core module

Bypass pump connection: Free pump outlet (e.g.: pump 1 on core module)

Storage tank pump connection: Free pump outlet (e.g.: pump 0.1)

Return mixer using HC1



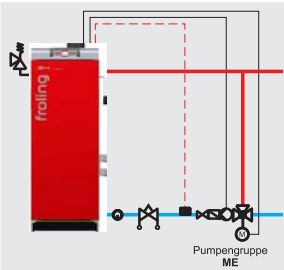
If the return temperature control is by way of mixing valve and the control is carried out via the heating circuit 1 on the core module, then this parameter must be activated.

Return sensor connection: Core module

Return feed mixer connection: Mixing value 1 on core module

Storage tank pump connection: Free pump outlet (e.g.: pump 0.1)

Return mixer using external mixer module



If the return temperature control is by way of mixing valve and the control is carried out via the external mixer, then this parameter must be activated.

Return sensor connection: Core module

Return feed mixer connection: Mixer output on return mixer module

Storage tank pump connection: Free pump outlet (e.g.: pump 0.1)

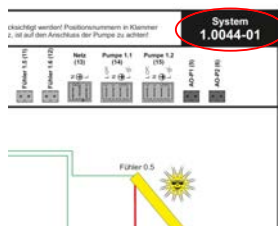
Boiler heat quantity recording method

Method used for determining the quantity of heat produced by the boiler.

System selection

In contrast to the standard configuration, the sensors and pumps for systems with S-Tronic Plus / S-Tronic Lambda are determined by the corresponding system due to the missing hydraulic module.

➔ "Hydraulic system for S-Tronic Plus / S-Tronic Lambda" ► 47]



If the system has been installed according to a "Non-binding Planning Suggestion", the hydraulic system setting can be found at the top right-hand corner of the planning suggestion.

If there is no planning suggestion, the selection table below also shows the hydraulic system to be set for the specific system:

	System-specific components								Additional functions								
	Storage tank	Boiler 2	4-sensor management	Middle storage tank sensor	Solar system via external HE	Storage tank in boiler house	Storage tank in house 2	Storage tank in building 3	Storage tank in building 4	Oil boiler blocking	Switch valve installed	DHW priority	Randomly programmable feature	Network pump	Circulation pump	Master boiler in the cascade	Solar system
Hydraulic System 0												✓	✓	✓	✓		✓
Hydraulic System 1	✓			✓								✓	✓	✓	✓	✓	✓
Hydraulic System 2	✓	✓		✓						✓	✓	✓	✓	✓	✓	✓	✓
Hydraulic System 3		✓										✓	✓	✓	✓		✓
Hydraulic System 4	✓	✓	✓							✓	✓	✓	✓	✓	✓		✓
Hydraulic System 12	✓	✓		✓	✓					✓		✓	✓	✓	✓	✓	
Hydraulic System 13	✓	✓		✓	✓					✓	✓	✓	✓	✓	✓	✓	
Variant 1												✓	✓	✓	✓		
Variant 2 and 5		✓		✓		✓				✓	✓	✓	✓	✓	✓	✓	✓
Variant 3		✓		✓		✓	YES / NO			✓	✓	✓	✓	✓	✓	✓	✓
Variant 4							✓	✓	✓			✓	✓	✓	✓		✓
Slave boiler in the cascade													✓	✓	✓		

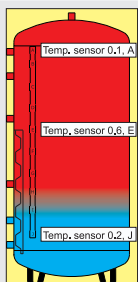
Is a standby boiler installed? (oil, gas, wood)

If a second heat generator (oil, gas, etc.) is installed, which should be integrated into the hydraulic system via the Frothing boiler controller, this parameter must be activated.

Which backup boiler is installed?

- Oil boiler
- Gas boiler
- Automatic fed
- Manually fed
- Gas boiler

Middle storage tank temperature sensor installed



If an additional sensor is used in the middle of the storage tank (e.g. reload calculation, shutdown criteria of a dual fuel boiler pellet unit etc.), in addition to the two standard sensors installed in the storage tank, this parameter must be activated.

Number of sensors for storage tank 1 with multi-sensor management

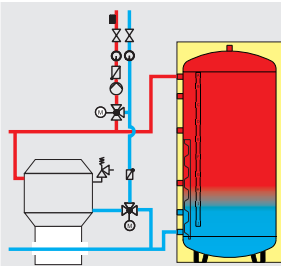
Indicates the number of sensors installed in the storage tank. All of the sensors are used to calculate the storage tank charge status.

Allow both boilers on

- **Yes:** Parallel mode
- **No:** Single mode

Using this parameter it can be set whether a standby boiler, if present, should run at the same time (if required) as the Froling boiler. If parallel mode is permitted (each boiler has its own chimney system; country-specific) or required, this parameter must be activated.

Switch valve installed

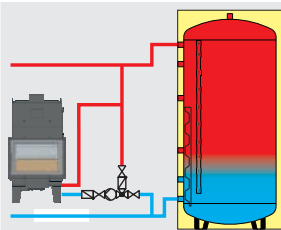


If an switch valve is installed in the standby boiler return in conjunction with a standby boiler, this parameter must be activated.

DHW priority

If the heating circuits should be switched off for the duration of domestic hot water tank loading, this parameter must be activated.

Additional freely programmable differential controller installed



If an additional heat generator (e.g.: wood burner with water pocket) is installed, which should be connected to the hydraulic system via the Froling boiler controller, this parameter must be activated.

Network pump installed

A network pump monitors all loads. The network pump starts if at least one load requires heat. The pump is speed controlled via a return feed sensor. If the return temperature rises, i.e. the setpoint of the return temperature is reached, the pump is controlled at minimum speed. The network pump stops only when all consumers no longer require heat.

If a network pump is activated in conjunction with a multiple house diagram (variant 3 or 4), you can set whether the pump is to monitor all consumers, or just the heat requirement of the storage tank.

If a network pump is installed, this parameter must be activated.

Circulation pump installed

If a domestic hot water circulation pump is installed, this parameter must be activated. The domestic hot water circulation pump can be combined with a time program, a flow sensor in the cold water line or a return feed sensor.

In the cascade, this boiler is the MASTER

For a cascade system, a boiler must be configured as a master boiler, the others configured as slave boilers. All of the hydraulic information (outside air temperature, storage tank temperatures, etc.) is combined on the master boiler and it decides which boiler is to run at which output. If this boiler is the MASTER, this parameter should be activated (this parameter has no function in conjunction with "Hydraulic system 0").

DHW tank system

DHW tank 01 ... 08 installed

If one or several domestic hot water tanks are installed in the hydraulic system, the respective parameter must be activated.

Heating circuit system

Heating circuit 01 ... 18 installed

If one or several heating circuits are installed, the respective parameter must be activated.

Remote control 1 ... 18 installed



If one of the three remote controls shown is installed in the respective heating circuit, the respective parameter must be activated.

Solar system

Solar collector 01 installed

If a solar panel system is installed, which is controlled via the Froeling boiler controller, this parameter must be activated.

A second pump is used instead of the switch valve

If one pump per solar element is used instead of the combination of collector pump and switch valve, this parameter must be activated.

Boiler remote control

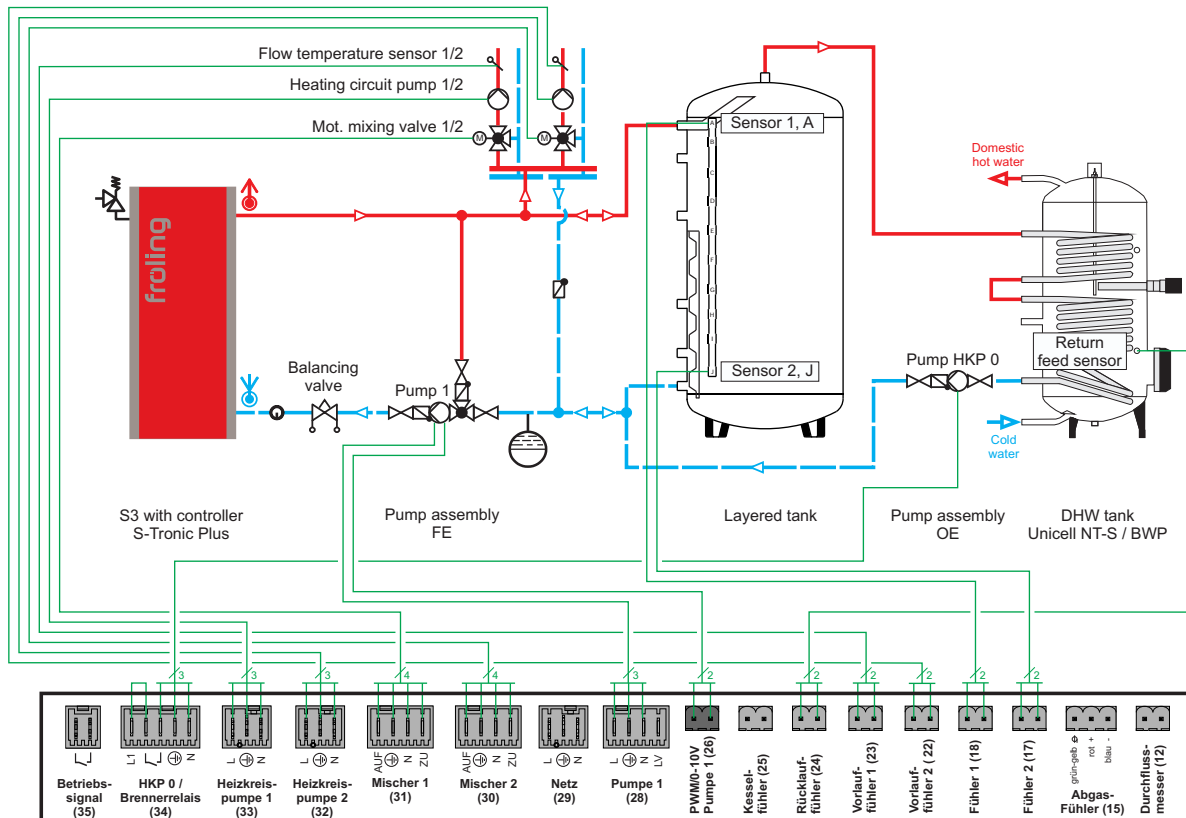
Remote control of the boiler can be activated

This menu item or parameter is only relevant for systems equipped with touch control and also use the internet portal froeling-connect.com!

4.2.3 Hydraulic system for S-Tronic Plus / S-Tronic Lambda

No hydraulic module is included in the standard delivery of facilities with S-Tronic Plus or S-Tronic Lambda (the same as S-Tronic Plus but with Lambda controller for the boiler). The system selection “Hydraulic system for S-Tronic” ensures the sensors are automatically assigned to the following inputs.

S-Tronic Plus / S-Tronic Lambda with layered tanks and water heater



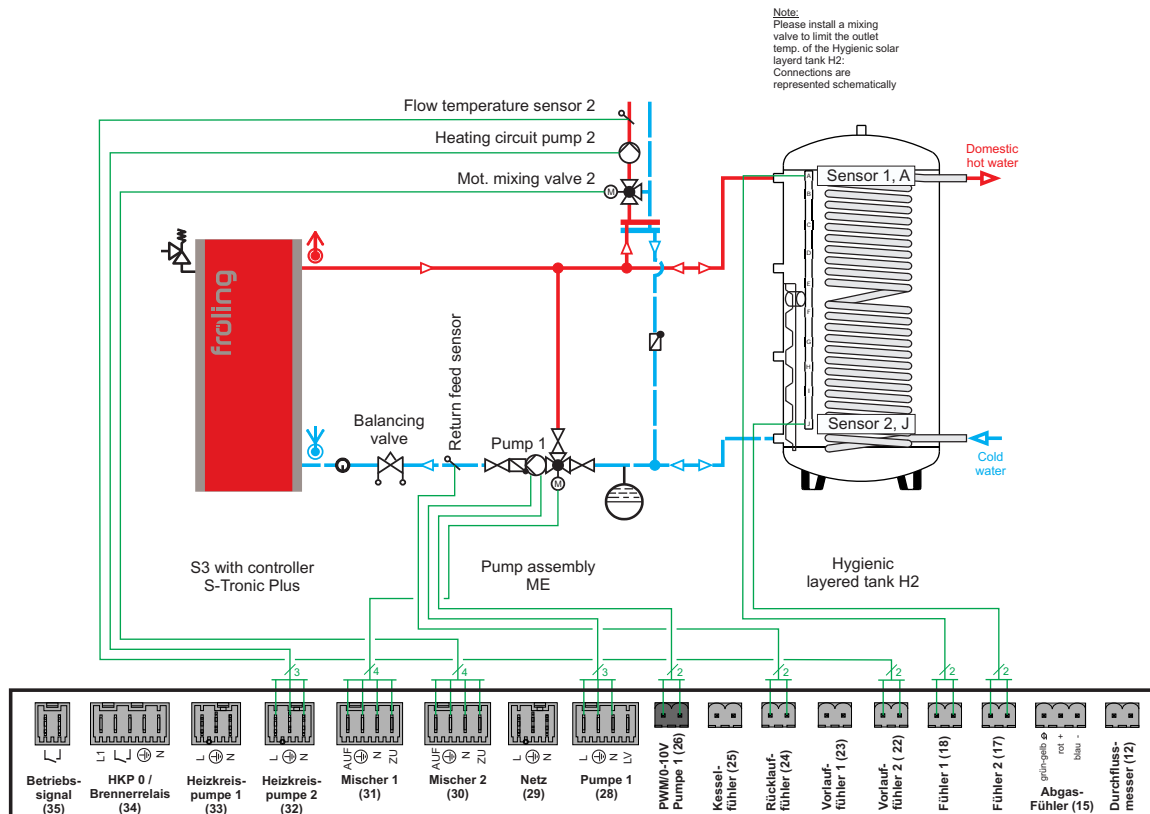
☐ Select “Hydraulic system for S-Tronic” system

↳ Sensor 1 is used for the top storage tank sensor, sensor 2 is used for the bottom storage tank sensor

☐ In the DHW tank service menu, set the “DHW tank 1 pump will be controlled from HCP0” parameter to “YES”

↳ The return feed sensor is used for the DHW tank sensor

S-Tronic Plus / S-Tronic Lambda with hygienic layered tanks and return temperature control with mixing valve



☐ Select “Hydraulic system for S-Tronic” system

↳ Sensor 1 is used for the top storage tank sensor, sensor 2 is used for the bottom storage tank sensor

☐ In the boiler configuration, set “Return temperature control via HK1” to “YES”

NOTICE! The hot water preparation is implemented via the hygiene element of the layered tank. As no sensor can be assigned, no DHW tank can be parameterised either. We recommend fitting some sort of control device (e.g. thermometer with external sensor) for the domestic hot water temperature.

4.2.4 Before heating up for the first time

- ☐ Check the system pressure of the heating system
- ☐ Check that the heating system is fully ventilated
- ☐ Check that the safety devices are present and working correctly
- ☐ Check that there is sufficient ventilation in the boiler room
- ☐ Check the seal of the boiler.

↳ All doors and inspection openings must be tightly sealed!

- ☐ Calibrate the broadband probe
- ☐ Check that the digital inputs are working correctly
- ☐ Check that the drives and servo motors are working and turning in the right direction

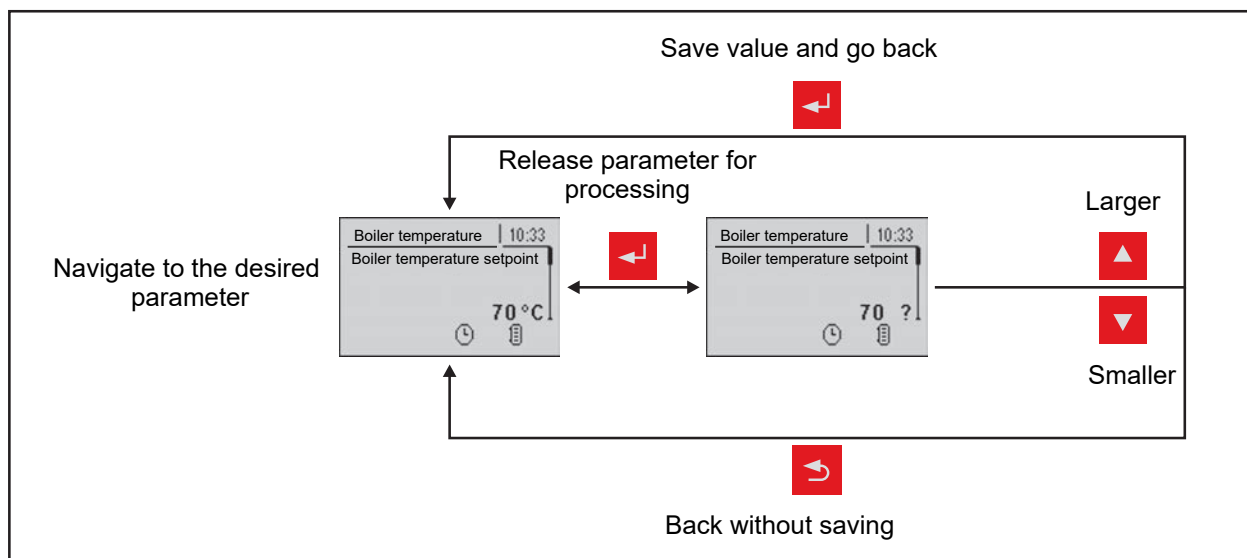
4.3 Operating statuses

The different operating statuses are displayed at the top left of the visual display:

Heating up	Boiler status during the heating up process up to a certain minimum flue gas temperature. Fan and primary air at 100%.
Preventilation (with auto ignition)	Safety function with operation with automatic ignition. Within a specified time, the boiler attempts to reach the status Heating without activating the ignition. Within this time period, heating up can be carried out manually, to bypass the automatic ignition.
Awaiting ignition (with auto ignition)	When the safety time has elapsed (preventilation operating status), the boiler remains in the status "Awaiting ignition" until the time specified in the ignition menu for the automatic ignition has been reached.
Ignition (with auto ignition)	The fuel is ignited with fan assistance. The boiler attempts to reach the criteria for heating status within a specified time.
Heating	The boiler controller controls combustion according to the boiler setpoints.
Slumber	Very low power consumption. When the boiler temperature setpoint is exceeded by a specified value, the boiler goes to "Slumber" status. The fan stops and the air flaps are closed to the minimum opening. If the temperature falls below the boiler temperature setpoint, the boiler returns to "Heating" status.
Door open	The insulating door is open and the fan runs at maximum speed.
Off	The fuel burns down to residual embers.
Fault	CAUTION - There is a fault!

4.4 Setting parameters

Values for all parameters are changed in the following way:



For initial startup the following parameters should be checked and adjusted if required:

- **Heating curve:** Radiator or underfloor heating

The other parameters are factory set in such a way that in most cases optimal operation is possible without making further changes to the parameters.

The following parameters, however, can/should be set as desired by the customer:

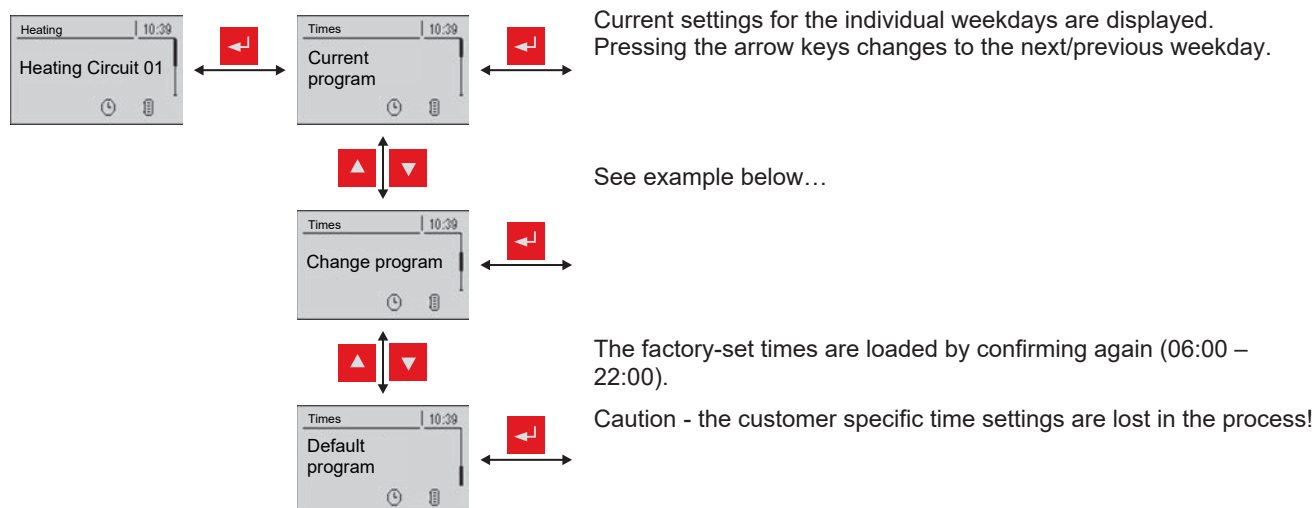
- **Desired boiler setpoint**
- **DHW tank loading times**
- **Solar controller**
- **Heating and setback times of the individual heating circuits**

4.5 Setting times

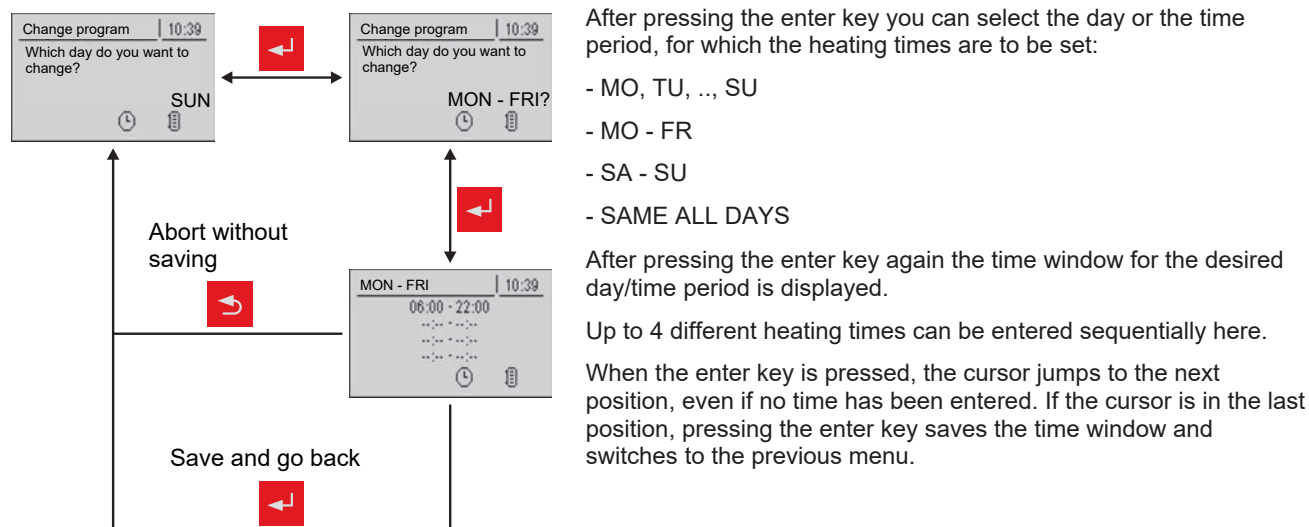
The desired time window for the component can be set in the "Times" submenu in the individual menus of the heating components (heating circuits, DHW tanks ...). The structure of the time menu and the procedure for changing the times are always the same.

Example - Setting times for heating circuit 01:

In the "Heating" menu -> "Times":



... In the "Change program" menu:



4.5.1 Deleting a time window

To delete a time window, the end time of the desired time window must be put to 24:00. If you press the up arrow key repeatedly, the time disappears and is replaced by dashes. Then carry out the same process with the start time. After the enter key has been pressed repeatedly, the changes are adopted and it returns to the previous menu.

5 Parameters overview

5.1 Heating

5.1.1 Heating - Status

Basic display



Heating



Heating circuit 1



Status

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.

5.1.2 Heating - Temperatures

Basic display



Heating



Heating circuit 1



Temperatures

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

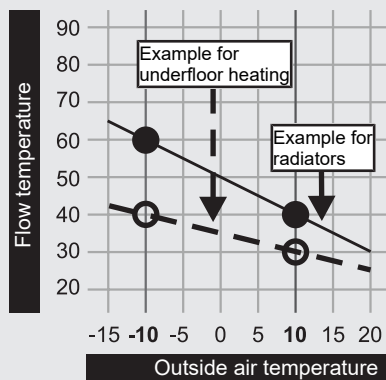
Room temperature which is regulated outside of the set heating times.

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.

5.1.3 Heating - Times



➤ "Setting times" [► 51]

5.1.4 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.

5.1.5 Heating - Heating up program

Basic display



Heating

Heating up
program

Service

Heating up program active

- **NO:** The heating up program is deactivated. When the heating up program is 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.

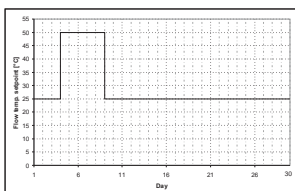
Heating up program 8 allows you to pre-define the progression of the flow temperature for each individual day.

Outfeed setpoint for all days in program 7

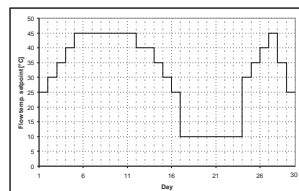
If heating up program 7 is active, the selected heating circuit is adjusted to the specified flow temperature.

Heating up programs

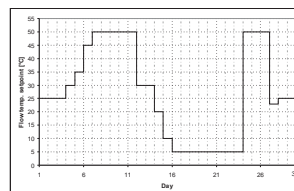
Heating up program 1:



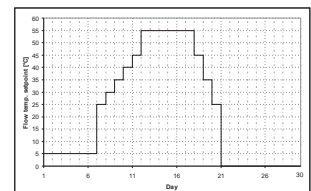
Heating up program 2:



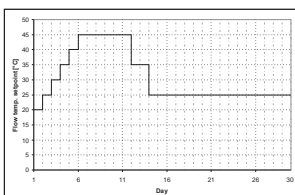
Heating up program 5:



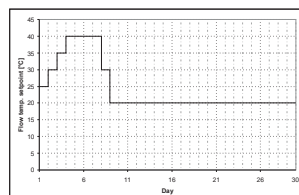
Heating up program 6:



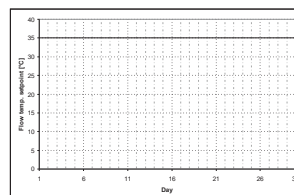
Heating up program 3:



Heating up program 4:

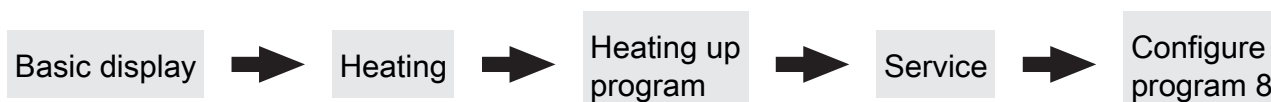


Heating up program 7:



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!

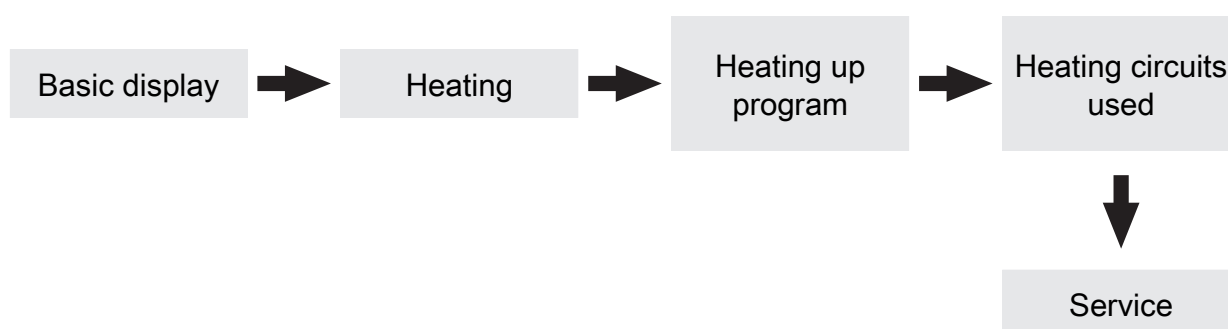
Configure program 8



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



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!

5.1.6 Heating - General settings

Basic display



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

5.2 Water

5.2.1 Water - Status

Basic display



Water



State

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.

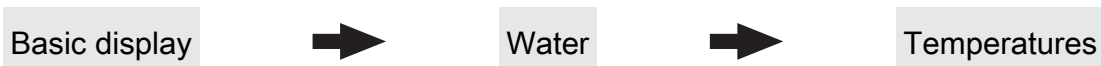
DHW tank bottom temperature

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.

5.2.2 Water - Temperatures



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).

5.2.3 Water - Times



➡ "Setting times" [▶ 51]

5.2.4 Water - Service



DHW tank 1 pump will be controlled from HCP0

Prerequisite: Hydraulic system for S3 Turbo

- **NO:** The HKP0 output switches to the parameter "Heating circuit release from following buffer tank temperature".
- **YES:** The DHW tank loading pump is controlled via the HKP0 output. The DHW tank sensor must be connected to the "Return feed sensor" sensor input.

NOTICE! The DHW tank can only be loaded using HCP0 if the return temperature control is not performed by the mixing valve.

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.

5.3 Solar

5.3.1 Solar - Status

Basic display



Solar



State

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

Outfeed: 80°C / RL: 50°C

P: 0.0 kW / DFL: 0

Today: 0 kWh

Total: 0 kWh

- **OUTFEED:** Current collector flow temperature
- **Return:** Current collector return feed temperature
- **P:** Current output which is generated by the solar collector
- **DFL:** Current flow rate of solar collector
- **Today:** Heat quantity that has been produced by the solar panel system today
- **Total:** Heat quantity that has been produced since activation of the solar panel system

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.

5.3.2 Solar - Temperatures

Basic display



Solar



Temperatures

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.

5.3.3 Solar system - Times

Basic display



Solar system



Times

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.

5.3.4 Solar - Service

Basic display



Solar



Service

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.

5.3.5 Solar - Heat meter

Basic display



Solar



Solar heat meter

Outfeed: 80°C / RL: 50°C
P: 0.0 kW / DFL: 0
Today: 0 kWh
Total: 0 kWh

- **OUTFEED:** Current collector flow temperature
- **Return:** Current collector return feed temperature
- **P:** Current output which is generated by the solar collector
- **DFL:** Current flow rate of solar collector
- **Today:** Heat quantity that has been produced by the solar panel system today
- **Total:** Heat quantity that has been produced since activation of the solar panel system

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.

5.4 Buffer tank

5.4.1 Buffer tank - Status

Basic display



Buffer tank



Buffer tank 01



Status

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.

5.4.2 Buffer tank - Temperatures

Basic display



Buffer tank



Buffer tank 01



Temperatures

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 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.

Top buffer temp. when the start-up relief valve switches to bottom buffer

If the temperature set is exceeded at top sensor in buffer tank, the start relief valve switches to bottom buffer tank.

Buffer 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 to calculate the amount of fuel required to load 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.

5.4.3 Buffer tank - Service

Basic display



Buffer tank



Buffer tank 01



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"

Residual heat use



Prerequisite: Return temperature control with mixing valve

YES: Diverts the residual energy to the buffer tank, the "Minimum boiler temperature to release all pumps" parameter is ignored. Minimum boiler temperature to release all pumps" parameter is then ignored. The pump is activated at minimum speed until the boiler temperature is lower than the bottom buffer tank temperature +3°C.

Mid buffer controller active? If No the sensor is only a display



Prerequisite: Middle buffer tank temperature sensor installed

- **NO:** The sensor in the mid area of the buffer tank is shown on the display.

YES: The sensor in the middle area of the buffer tank is used for the border layer loading function.

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.

Refill calculation active (sensors have to be assigned correctly)



- **YES:** When opening the insulated door a recommendation message regarding the amount of fuel required to load up the layered tank appears on the display.

Minimum value for the reload quantity



If the calculated reload quantity is less than the minimum value setting, an instruction is displayed to the user that he need not heat up/reload.

Is a hygienic layered tank used



- **YES:** If a hygienic layered tank (combi tank) is used, 1/3 of the storage volume is subtracted when calculating the amount of fuel.

Volume of the used buffer tank



The buffer tank volume set here is used for calculating the required amount of fuel to fully load the buffer tank.

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.

Pump outlet for buffer tank relief valve

The switch valve switches off part of the layered tank until an adjustable temperature has been reached in the top layer of the tank so that the boiler reaches the temperature more quickly. Once this temperature has been reached, the switch valve switches back and the entire volume of the layered tank is available to the boiler.

Invert pump outlet for buffer relief valve

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

5.5 Boiler

5.5.1 Boiler - Status

Basic display



Boiler



State

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.

ID fan speed

Display of the current ID fan speed.

Primary air

Display of the current value of the primary air flap according to controller.

Position of primary air flap

Display of the current position of the primary air flap (adjusted for the air settings).

Residual oxygen content

Display of the current residual oxygen content.

Oxygen control

Display of control of primary and secondary air flap.

Secondary air

Display of the current value of the secondary air flap according to controller.

Position of secondary air flap

Display of the current position of the secondary air flap (adjusted for the air settings).

Sensor 1

Display of the current temperature at sensor 1.

Return sensor

Prerequisite: Return temperature control with mixing valve or bypass pump

Display of the current temperature at the boiler return.

Return pump controller

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

5.5.2 Boiler - Temperatures

Basic display



Boiler



Temperatures

Boiler temperature setpoint

The boiler temperature is regulated to this temperature. 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 switches to “slumber” status. 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.

5.5.3 Boiler - Service

Basic display



Boiler



Service

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!

Output fire off message using HCP0

- **NO:** The HKP0 output toggles as determined by the parameter „Minimum boiler temperature to release all pumps“.
- **YES:** The HKP0 output toggles when the boiler switches to “Fire Off” status.

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.

5.5.4 Boiler - General settings

Basic display



Boiler



General settings

Fuel selection

- **Dry firewood:** If firewood is to be burnt with a water content of less than 15%, this setting should be selected. A prompt then appears to confirm whether the specified values for the chosen fuel selection should be adopted.
- **Wet firewood:** If firewood is to be burnt with a water content of more than 15%, this setting should be selected. A prompt then appears to confirm whether the specified values for the chosen fuel selection should be adopted.

Abort heating up --> ID fan off, close air flaps

- **NO:** The heating up process is not aborted.
- **YES:** If the criteria for "Off" is reached, the heating up process of the boiler can be cancelled. The air flaps close, the induced draught fan stops.

NOTICE! In order to cancel the heating up process, the criteria for "Off" must be fulfilled!

The current flue gas temperature is set lower than under "Flue gas temperature, below which boiler switches to OFF status".

The current residual oxygen content is higher than that set under "Residual oxygen content, above which it switches to OFF".

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.

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" [► 29]

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.

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.

General settings - MODBUS settings

Basic display



Boiler



General settings



MODBUS settings

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.

5.6 Boiler 2**5.6.1 Boiler 2 - Status**

Basic display



Boiler 2



State

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.



5.6.2 Boiler 2 - Temperatures

Basic display



Boiler 2



Temperatures

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.

5.6.3 Boiler 2 - Service

Basic display



Boiler 2



Service

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.

5.7 Ignition

Basic display



Ignition

Automatic ignition

- **NO:** Automatic ignition deactivated
- **YES:** Automatic ignition activated.

Ignition time (date - time)

Day (date or daily) and time setting for the start of ignition. The parameter is active only if the parameter "Start ignition" is set to "by time". „Start ignition“ is set to "Date and time", "Buffer tank min" or "Buffer < maximum flow temperature".

NOTICE! The boiler status must generally be "Ignition wait" for ignition to start! Follow the instructions for heating up with the automatic ignition!

- **"Date and time" method:** Ignition starts at the specified time exactly. If the parameter is set to "daily" instead of the date, ignition starts every day at the specified time.
- **"Buffer tank min" method:** The ignition process starts if heat is requested from the buffer tank from the specified time (parameter „Boiler start if difference between boiler setpoint and top buffer tank is larger"). The period applies from the specified time until 24:00 h on the specified date. If the specified time is not subsequently changed and ignition is not disabled, the buffer tank loading criterion applies daily from the specified time.
- **"Buffer < maximum flow temperature" method:** The maximum flow temperature required by the system environment (e.g. heating circuit) is compared with the current buffer tank temperature from the specified time. The ignition process starts if the top buffer tank temperature falls below the maximum flow temperature setpoint. The period applies from the specified time until 24:00 h on the specified date. If the specified time is not subsequently changed and ignition is not disabled, the start criterion applies daily from the specified time.

Maximum ignition duration

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

Oxygen reduction for fire detection

If the residual oxygen content decreases by the set value, ignition stops after a defined delay time elapses.

ID fan during ignition

In "Ignition" status, the induced draught blower fan is operated with the specified control.

Time from turning on ignition to rising ID fan controller

Time after activating ignition after which the induced draught fan controller starts to rise.

5.8 Network pump

5.8.1 Network pump - Status

Basic display

Network
pump

State

Network return temperature



Display of the current return temperature of the remote line.

Network pump speed



Specifies the current speed of the network pump.

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.

5.8.2 Network pump - Temperatures

Basic display

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.

5.8.3 Network pump - Service

Basic display

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.

5.9 Difference regulator

5.9.1 Difference regulator - Status

Basic display

Diff.
control

State

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.

5.9.2 Difference regulator - Temperatures

Basic display

Diff.
control

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.

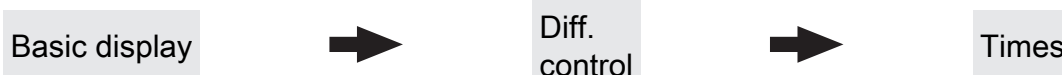
Minimum temperature for heat source

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.

5.9.3 Difference regulator - Times



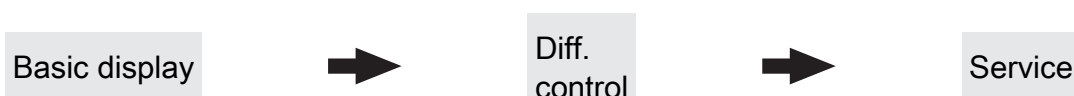
Diff. control start time

If, after reaching the specified time, the criteria for starting the differential controller are permitted, the pump of the differential controller starts.

Diff. control stop time

Also when the criteria for starting the differential controller is fulfilled, the differential controller is only active until the specified time.

5.9.4 Difference regulator - Service



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

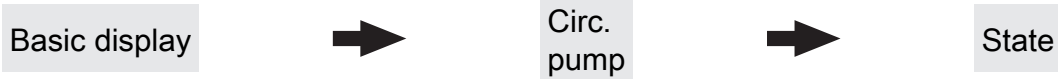
Sensor input to which the heat sink sensor is connected.

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.

5.10 Circulation pump

5.10.1 Circulation pump - Status



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

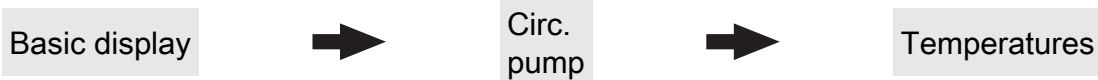
If the flow sensor is implemented as a push-button:

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

Speed of the circulation pump

Specifies the current speed of the circulation pump.

5.10.2 Circulation pump - Temperatures



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!

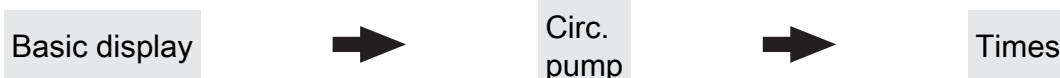
Circulation pump run-on

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.

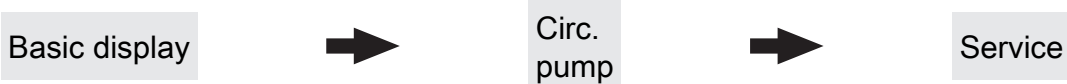
NOTICE! Parameter only relevant when using a flow switch!

5.10.3 Circulation pump - Times



➡ "Setting times" [▶ 51]

5.10.4 Circulation pump - Service



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.

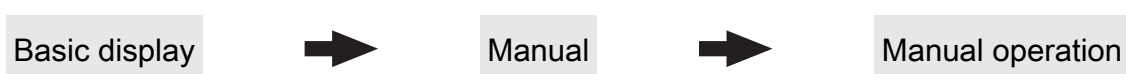
➡ "Activation options of pump outlets" [▶ 95]

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.

5.11 Manual

5.11.1 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!

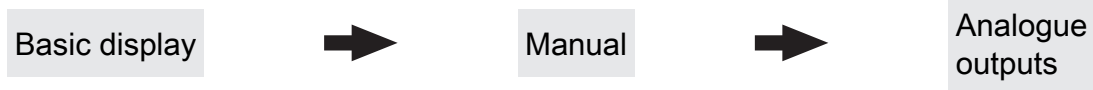
5.11.2 Manual - Digital outputs



The parameters displayed depend on the boiler configuration!

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

5.11.3 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

5.11.4 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

5.12 System

5.12.1 System - Settings

Setting - Boiler temperature



↪ "Boiler - Temperatures" [► 70]

Setting - Flue gas



Maximum heating up time, during which HEATING status must be reached

If the criteria for the "Heating" status is not reached after a specified time, it switches to "Heating" status regardless. If the flue gas temperatures rises and the residual oxygen content falls, the "Heating" status remains active. If the criteria for "Heating" status is not reached within 5 mins, the boiler switches to "Off" status.

Minimum flue gas temperature

Lowest operation point of flue gas temperature for continuous operation.

Max. flue gas temperature

Highest operation point of flue gas temperature for continuous operation.

Start increase of flue gas temperature

The flue gas temperature setpoint rises by the specified value set here during "Heating up" status.

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.

Flue gas temperature, below which boiler switches to OFF status

If flue gas temperature remains below this value throughout the period specified by „ for themaximum heating up time during which HEATING status must be reached“, the boiler switches to "Off" operating status.

Activating the prompt to close the door

- **YES:** If the criteria for "Heating" status are reached when heating up, the "Close the door!" prompt appears on the display.
- **NO:** The "Close the door!" prompt is not displayed after reaching the criteria for the "Heating" status.

Increase of flue gas temperature for prompt to close the door

When the flue gas temperature rises by this value in "Heating up" status, the "Close the door!" prompt appears on the display.

Residual O2 content below which the instruction to close the door appears

When the residual oxygen content falls below this value in "Heating up" status, the "Close the door!" prompt appears on the display.

Desired work point of flue gas temperature

Flue gas temperature to be maintained in firewood operation under the influence of the boiler control variable.

Maximum ignition duration

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

Setting - Air settings

Basic display



System



Setting



Air settings

Minimum ID fan speed

Lower operation point of the ID fan characteristic line.

ID fan min

Base point for setting the ID fan characteristic line.

ID fan max

End point for setting the ID fan characteristic curve.

Minimum secondary air in heating

In "Heating" status, the opening of the secondary air flap is not lower than the specified value.

Secondary air at door open during status Heating

If the insulated door of the boiler is opened in "Heating" status, the secondary air flap is opened to the specified value.

Safety time for checking for air leaks

In "Heating" status, if the control of the secondary air flap is "0%" and the current flue gas temperature is over "100°C" the safety time starts. If the control of the secondary air flap does not change within this set period of time, a warning appears on the display.

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.

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.

Setting - Lambda values

Basic display



System



Setting



Lambda values

Residual oxygen content setpoint

Residual oxygen content which is regulated during "Heating" operating status.

Residual oxygen content, above which it switches to OFF

If the current residual oxygen content in "Heating" status exceeds the specified value for the duration of the „Maximum heating up time, during which HEATING status must be reached“, the boiler switches to "Off" status.

Set - Lambda probe

Basic display



System



Setting



Lambda values

Residual oxygen content

Display of the current residual oxygen content.

Lambda probe status

The following status displays are possible:

- Off
- Pre-heating
- Normal operation
- Cooling
- Reheating
- Error

Lambda probe type

Setting the Lambda probe type used:

- Bosch broadband probe
(item number: 69001A, "broadband probe" socket)
- NTK broadband probe
(item number: 69003, "broadband probe" socket)
- Bosch switching-type sensor
(type LSM11, "Lambda probe" socket)
- NTK switching-type sensor
(type OZA685, item number: 69400, "Lambda probe" socket)

Lambda probe heating

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

Lambda probe calibration (probe must be at 21% O2)

- **YES:** After activation of the Lambda probe heating, the Lambda probe can be calibrated.

NOTICE! The Lambda probe must be at 21% oxygen (air)!

Automatic lambda probe calibration active

- **YES:** If the boiler is in one of these statuses ("Boiler off", "Off", or "Standby") for a minimum period, which can be set ("Minimum time at standstill"), the broadband probe will be calibrated to 21%.
For boilers with automatic loading, calibration is carried out at the next start (status "Preparation").
For boilers with manual loading, the boiler changes to the "sensor check" status after this time has elapsed (additional indication on the display). The ID fan is activated and the secondary air is completely opened. If the insulated door is opened in this status, the process is aborted.
The prerequisite for calibration is that the probe provides a stable measurement for one minute. If the measurement exceeds 21% for more than one minute, the probe is also calibrated, regardless of the standstill times.

Minimum time at standstill

Defines the duration that the boiler must be in "Boiler Off", "Off" or "Standby" mode to start automatic Lambda sensor calibration.

Residual oxygen, above which the lambda probe is allowed to switch off

If the boiler switches to "Boiler off" or "Off" mode, the lambda probe heating remains active for at least 1 hour, up to a maximum of 24 hours. If the residual oxygen content exceeds the value set here, the lambda probe heating is switched off.

Switching-type sensor

Basic display



System



Setting



Lambda probe



Switching-type sensor

Residual oxygen content

Display of the current residual oxygen content.

Lambda probe voltage measured

Display of the current measured Lambda probe voltage.

Lambda probe correction value

Correction value for lambda measurement. If too much is displayed, this value must be set to positive, if too little is displayed, the value must be set to negative.

Lambda probe voltage corrected

Display of the measured Lambda probe voltage, at which the „Lambda probe correction value“ governs the response.

Broadband probe

Basic display



System



Setting



Lambda probe



Broadband probe

Residual oxygen content

Display of the current residual oxygen content.

Broadband probe heating current

The measured heating current of the broadband probe is displayed.

Broadband probe heating voltage

The measured heating voltage of the broadband probe is displayed.

Broadband probe Nernst voltage

The measured Nernst voltage of the broadband probe is displayed.

Broadband probe pump current

The measured pump current of the broadband probe is displayed.

Broadband probe internal resistance

Display of the measured internal resistance of the broadband probe.

Pump current at the last calibration

Setting - General settings



↻ "Boiler - General settings" [▶ 71]

Set - Heat quantity 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.

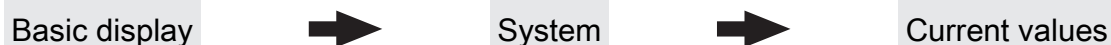
↻ "Calculating the feed output of the circulating pump" [▶ 97]

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" [▶ 97]

5.12.2 System - Current values



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

5.12.3 System - Error

Error - Error display



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.

Error - 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.

Error - Error history



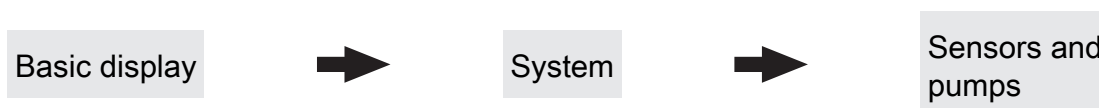
Up to 50 fault indication entries are stored in the error history. A fault can consist of up to 3 fault indication entries. You can determine what type of fault message it is, when the fault occurred (appeared), when the fault was acknowledged and when the fault was eliminated (cleared). If all 50 fault 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.

Error - Clear error history



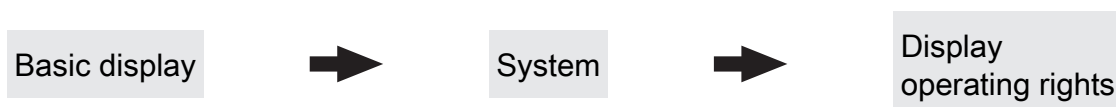
The entire error history can be deleted using this function. From this time on, the error history will be filled again with new fault messages.

5.12.4 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.

5.12.5 System - 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:

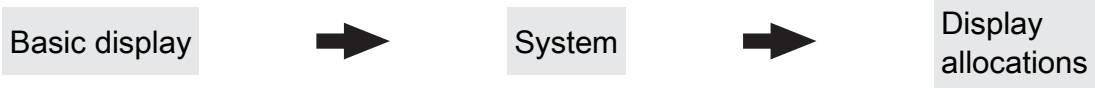
Allow access to solar system 01?	
Specifies whether solar system 01 can be accessed from touchscreen 1 ... 7.	

Heating system:

The parameters displayed depend on the configuration.

Boiler:**Boiler values visible**

If this function is activated, all boiler status values and the “Boiler” menu are available on the room console.

5.12.6 System - Display allocations**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!

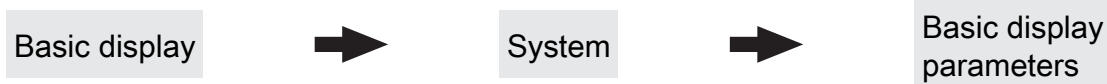
DHW tank system:**Touchscreen with address 1 ... 7 is assigned to the following DHW tank:**

To assign a DHW tank to a specific room console, the respective DHW tank number with its address must 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 DHW tank:

To assign a DHW tank to a specific room console, the respective DHW tank number with its address must be set on the room console. The parameters are set to “none” at the factory!

5.12.7 System - Basic display parameters



You can individually adjust how the two items are shown in the basic display, and for each item you can choose from several parameters: e.g. boiler, flue gas, external, room, DHW tank, storage tank top, storage tank bottom, storage tank graph, etc.

Position 1	Boiler	Selected
Position 2	Flue gas	Selected
<div> <div>Off 10:27</div> <div> <div>Boiler 26 °</div> <div>Flue gas 26 °</div> <div>⌚ 📄</div> </div> </div> <div> <div>Heating 13:52</div> <div> <div>77 ° AT 5 °</div> <div>72 ° KT 30 °</div> <div>BT 36 °</div> <div>🔥 ⌚ 📄</div> </div> </div>		

If the “storage tank graph” is selected, the temperatures of the top, middle (if available) and bottom storage tanks will be displayed next to the graph. In addition, further, fixed predefined values will be displayed:

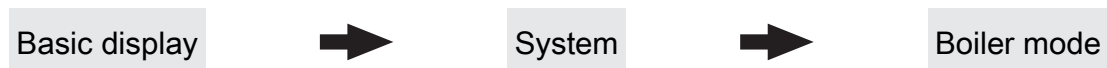
OT ... Outside temperature

BT ... Boiler temperature

RT ... Room temperature (on room console BT is replaced by RT)

DT ... DHW tank temperature (if available)

5.12.8 System - Boiler mode



Boiler mode

- **Automatic mode:** When “Automatic” is selected, the heating circuits as well as the domestic hot water tank are supplied with heat from the storage tank according to the selected heating times.
- **Domestic hot water:** In “Domestic hot water” mode, the domestic hot water tank is supplied with heat from the storage tank within the selected domestic hot water loading times. Heating circuits are not supplied with heat. Frost protection active.

5.12.9 System - Language

Basic display



System



Language

Language - Sprache - Langue - Lingua - Jezik

- Deutsch, English, Francais, Italiano, Slovenski, Cesky, Polski, Svenska, Espanol, Magyar, Suomi, Dansk, Nederlands, Русский, Serbian

5.12.10 System - Current Date

Basic display



System



Current Date

Current Date

Display and setting of current date.

5.12.11 System - Current Time

Basic display



System



Current Time

Current Time

Display and setting the current time.

5.12.12 System - Current User Level

Basic display



System



Current user level

Child lock (Code "0")

At "Child lock" level, only the "Status" menu appears. It is not possible to change parameters at this level.

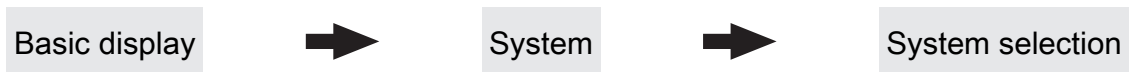
Customer (Code "1")

Standard user level for normal operation of the display. All customer-specific parameters are displayed and can be changed.

Installer / Service

Releases parameters to adjust the controller to the system components (if configured).

5.12.13 System - System selection



➡ "Setting the system type" [▶ 42]

6 Troubleshooting

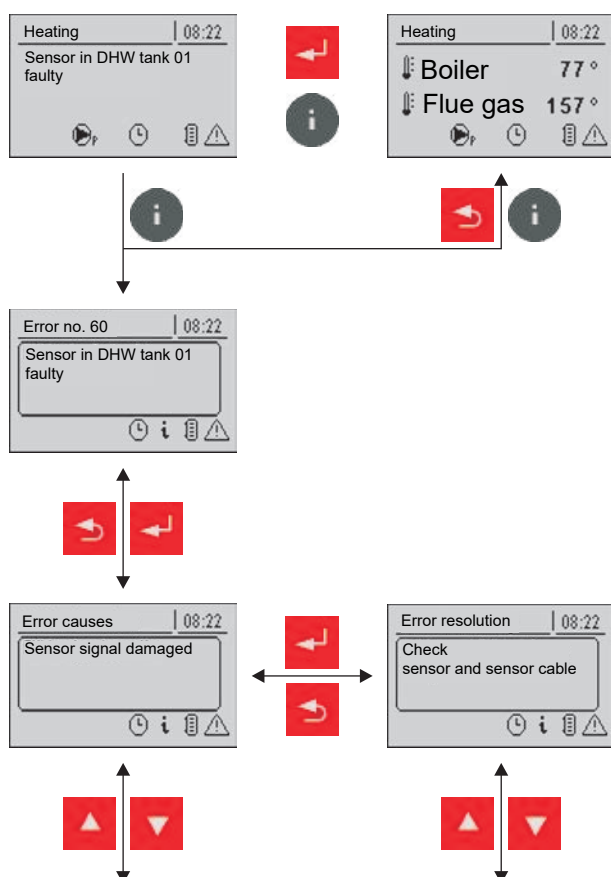
The term "fault" is a collective term for warnings, errors and alarms. The boiler reacts differently to the three types of message:

WARNING	In case of warnings the status LED flashes orange and the boiler initially continues controlled operation.
ERROR	In case of errors, the status LED flashes red, the boiler follows shutdown procedure and remains in operating status "Off", until the error is resolved. After troubleshooting, the boiler switches back to the operating status "Off".
ALARM	An alarm triggers a system emergency stop. The status LED flashes red, the boiler switches off immediately and the heating circuit controller and pumps remain active.

6.1 Procedure for fault messages

When a fault occurs:

- The status LED flashes with a red or orange light
- The display shows the current fault message and the warning symbol in the status line



After pressing the enter key the fault is acknowledged. The warning symbol in the status line shows that the fault is still pending.

Pressing the info key displays the fault as info text with the related fault number. The warning symbol only switches off when the fault has been resolved!

After pressing the enter key, an info text on the cause of the fault is displayed. Pressing the enter key again displays instructions for resolving the fault.

If a fault has various causes or the cause can be resolved in various ways, you can scroll through with the navigation keys.

7 FAQ

7.1 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

7.2 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)

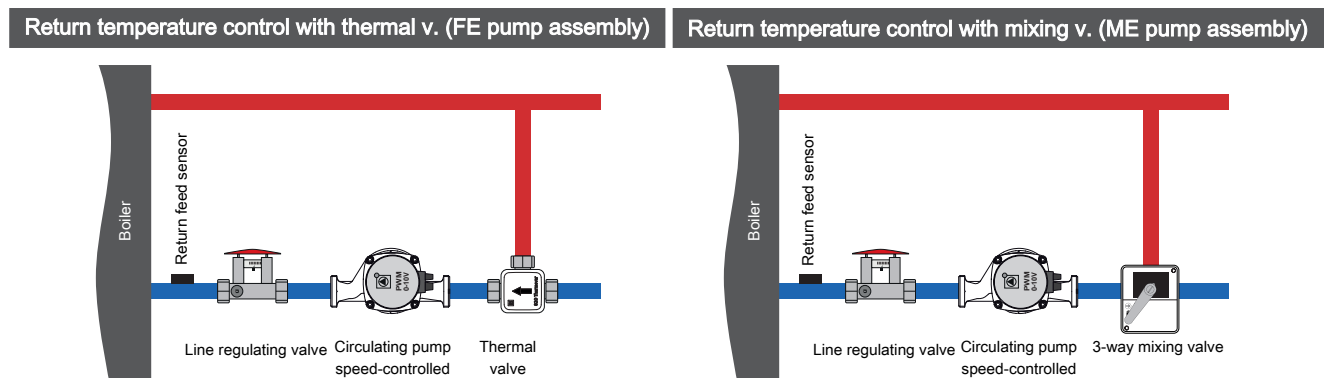
7.3 Boiler operating statuses

Heating up	Boiler status during the heating up process up to a certain minimum flue gas temperature. Fan and primary air at 100%.
Preventilation (with auto ignition)	Safety function with operation with automatic ignition. Within a specified time, the boiler attempts to reach the status Heating without activating the ignition. Within this time period, heating up can be carried out manually, to bypass the automatic ignition.
Awaiting ignition (with auto ignition)	When the safety time has elapsed ("Preventilation" operating status), the boiler remains in the "Awaiting ignition" status until the time specified in the "Ignition" menu for the automatic ignition has been reached.
Ignition (with auto ignition)	The fuel is ignited with fan assistance. The boiler attempts to reach the criteria for heating status within a specified time.
Heating	The boiler controller controls combustion according to the boiler setpoints.
Slumber	Very low power consumption. When the boiler temperature setpoint is exceeded by a specified value, the boiler goes to "Slumber" status. The fan stops and the air flaps are closed to the minimum opening. If the temperature falls below the boiler temperature setpoint, the boiler goes back to "heating" status.
Door open	The insulating door is open and the fan runs at maximum speed.
Off	The fuel burns down to residual embers.
Fault	CAUTION - There is a fault!

7.4 Determination of the quantity of heat

7.4.1 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.



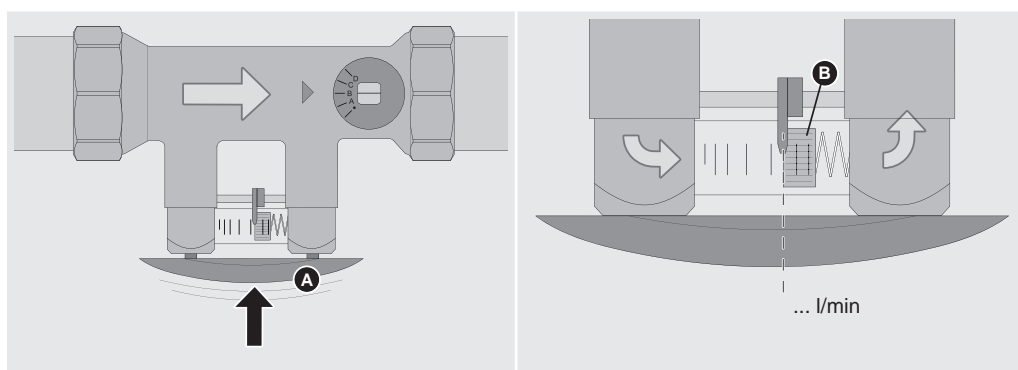
7.4.2 Functioning and configuration

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

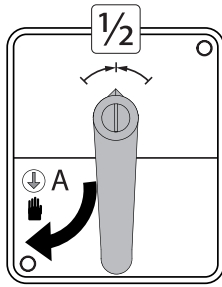
Boiler with thermal valve

- ☐ Bring the boiler to the boiler temperature setpoint

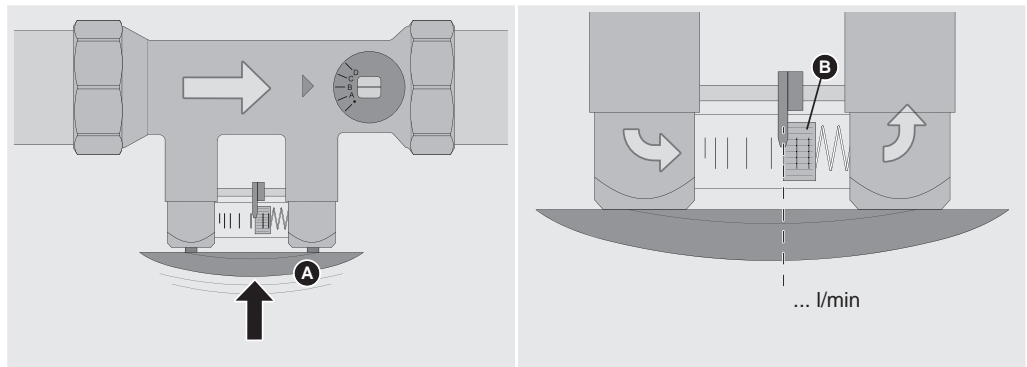


- ☐ Activate the circulating pump in manual operation with 100% speed
- ☐ Press the handle (A) on the line regulating valve
- ☐ Read and record the flow rate in l/min at the underside of the floater (B)
- ☐ Activate the circulating pump in manual operation at 50% speed
- ☐ Press the push bar on the line regulating valve; make a note of the flow on the scale

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 float (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

- ☐ Set the relevant parameters accordingly for boilers with button display in the Boiler type menu (System → System → System selection → Boiler type → Flow rate sensing for calculating the heat quantity)

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

Notes

Manufacturer's address

Fröling Heizkessel- und Behälterbau GesmbH

Industriestraße 12
A-4710 Grieskirchen
+43 (0) 7248 606 0
info@froeling.com

Zweigniederlassung Aschheim

Max-Planck-Straße 6
85609 Aschheim
+49 (0) 89 927 926 0
info@froeling.com

Froling srl

Via J. Ressel 2H
I-39100 Bolzano (BZ)
+39 (0) 471 060460
info@froeling.it

Froling SARL

1, rue Kellermann
F-67450 Mundolsheim
+33 (0) 388 193 269
froling@froeling.com

Installer's address

Stamp

Froling customer services

Austria
Germany
Worldwide

0043 (0) 7248 606 7000
0049 (0) 89 927 926 400
0043 (0) 7248 606 0



www.froeling.com

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