

Service manual

Lambdatronic S 3200 & S-Tronic Plus/Lambda

Core module Version 50.04 - Build 05.20



Translation of the original German installation instructions for technicians

Read and follow the instructions and safety information!

Technical changes, typographical errors and omissions reserved!

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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:

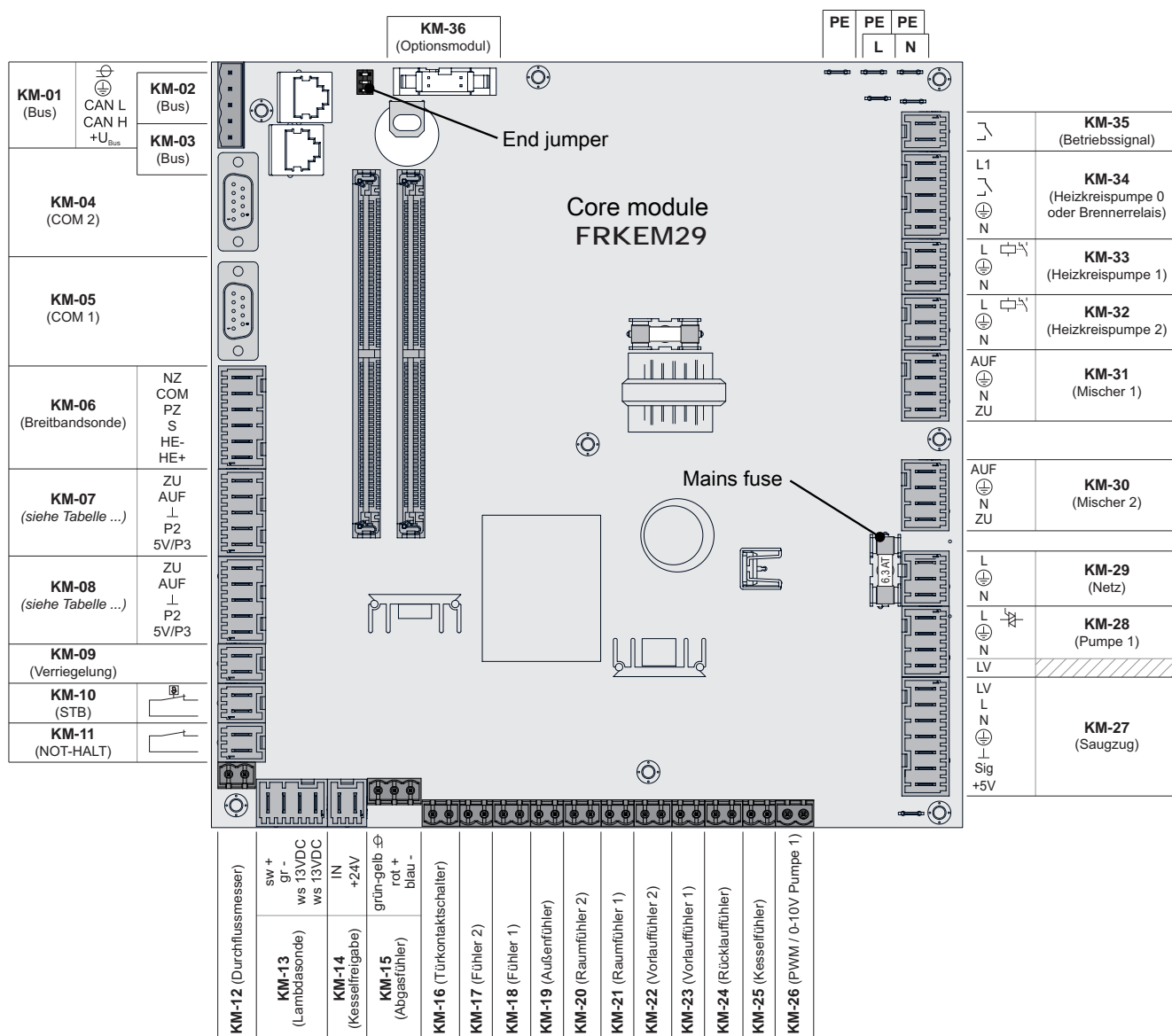
- ☐ Shut down the boiler according to procedure ("Off" operating status) and allow it to cool down
- ☐ Protective gloves must usually be worn for work on the boiler, and it should only be operated using the handles provided
- ☐ Insulate the flue gas pipes and do not touch them during operation

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; ⇒ See "Connecting the bus cable" [page 29] 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 | BUS | |
| KM-04 | COM 2 | Null modem cable 9-pin SUB-D; Connection is used e.g. as MODBUS interface |

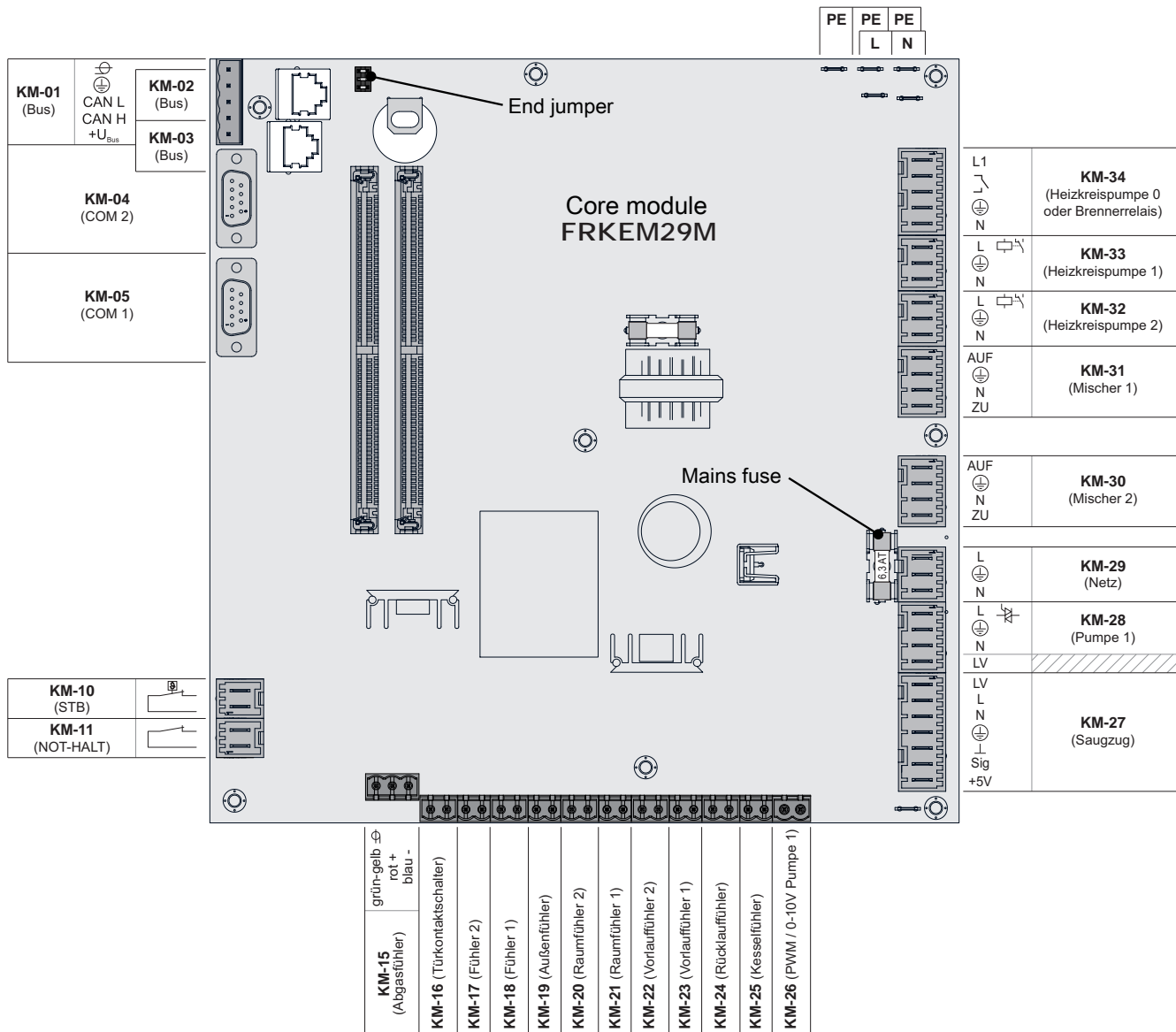
| Connection / Name | | | Note |
|-------------------|---|---|--|
| KM-05 | COM 1 | | Null modem cable 9-pin SUB-D; Service interface for software update and connection to visualisation software |
| KM-06 | Broadband probe | | Connection cable ¹⁾ 5 x 0.75 mm ² Connection of a Bosch (item number 69001A) or NTK (item number 69003) broadband Lambda probe |
| KM-07 | Secondary air | S1 Turbo S3 Turbo S4 Turbo S4e Turbo | Connection cable ¹⁾ 5 x 0.75 mm ² ; S1 Turbo: Combined air damper for primary and secondary air |
| KM-08 | Primary air | S3 Turbo S4 Turbo S4e Turbo | 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 ⇒ See "Analogue module" [page 26] |
| KM-15 | Flue gas temperature sensor | | Only use connection cable of the component 24 V supply ⇒ See "Analogue module" [page 26] |
| 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 |

| Connection / Name | | Note |
|--|--|---|
| 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 | Operating signal | Connection cable ¹⁾ 2 x 0.75 mm ² ⇒ See "Operating signal" [page 15] |
| 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 | Pump 1, induced draught fan |
|----|--------|-----------------------------|

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; ⇒ See "Connecting the bus cable" [page 29] 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. |

| Connection / Name | | Note |
|-------------------|---|--|
| KM-15 | Flue gas temperature sensor | Only use connection cable of the component |
| 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

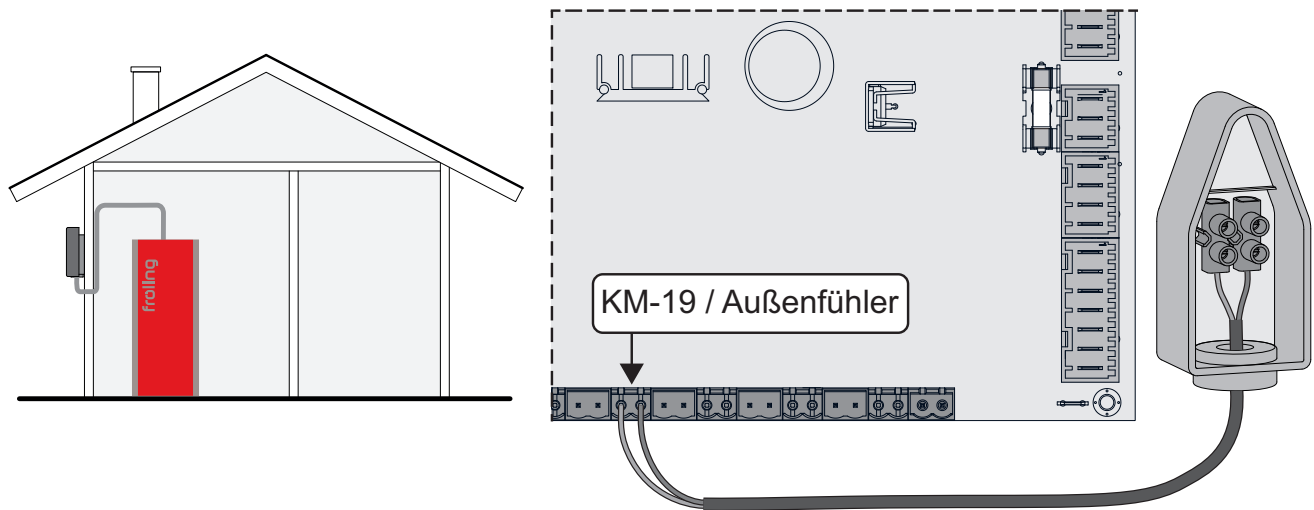
Connect the power supply at the "mains connection" plug

- ☐ 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 |
|-------------|----------------|-----------|
| S1 Turbo | 16A | C16A |
| S1 Turbo F | 16A | C16A |
| S3 Turbo | 13A | C13A |
| S4 Turbo | 16A | C16A |
| S4 Turbo F | 16A | C16A |
| S4e Turbo | 16A | C16A |

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.

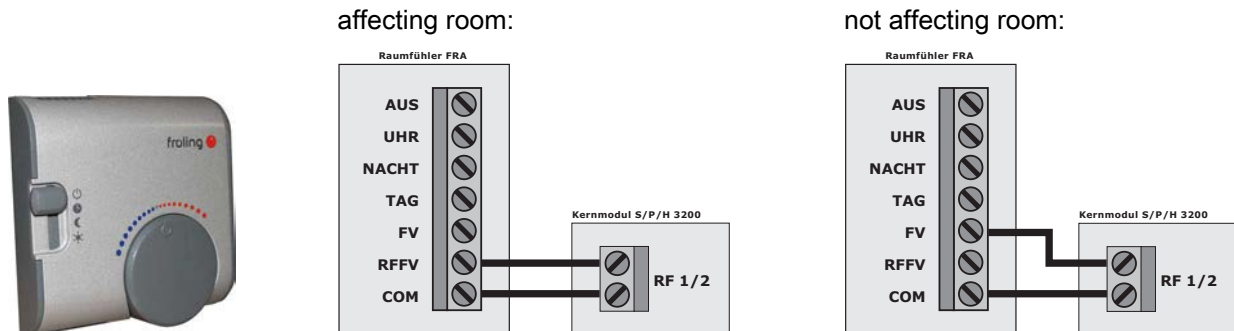


In the delivered state, the outside temperature sensor is read in by the core module ("KM-19 / outside temperature sensor" connection). Alternatively, the outside temperature sensor can be connected to an additional heating circuit module.

⇒ See "Heating circuit module" [page 16]

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 | |

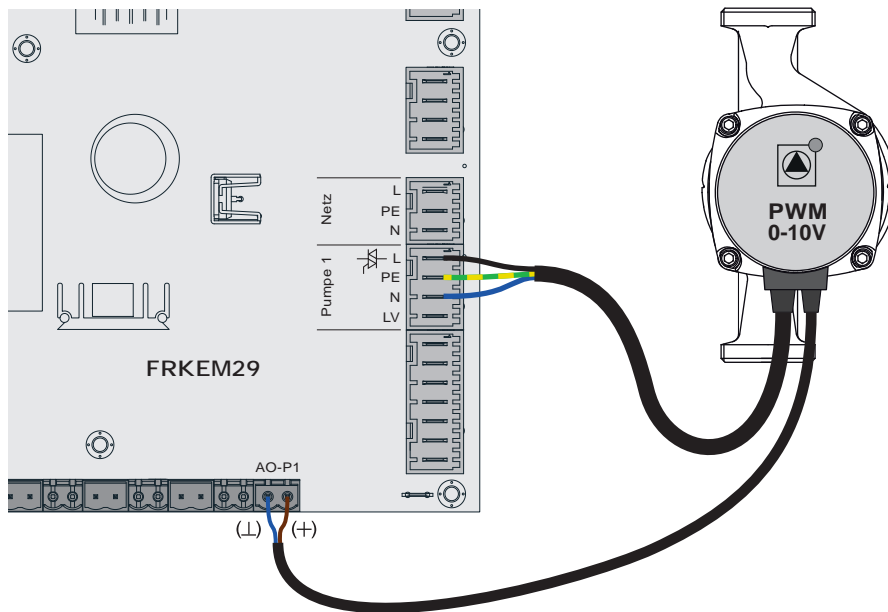
IMPORTANT! Refer to the supplied assembly instructions for more detailed explanations on connecting and operating the FRA room temperature sensor.

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)

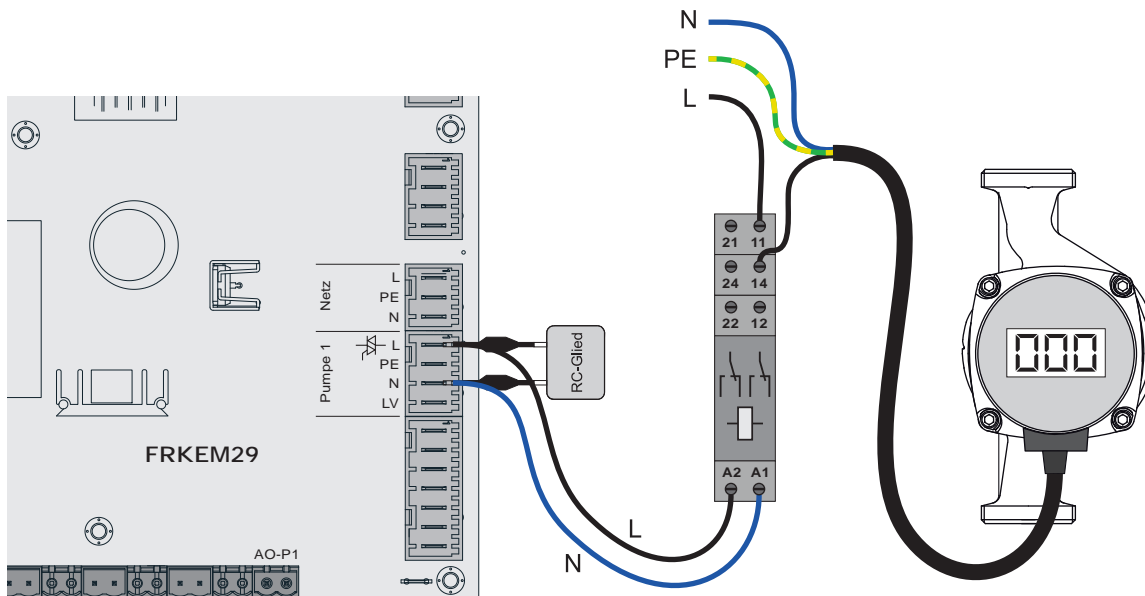
On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PWM or 0-10V signal.



- ☐ 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

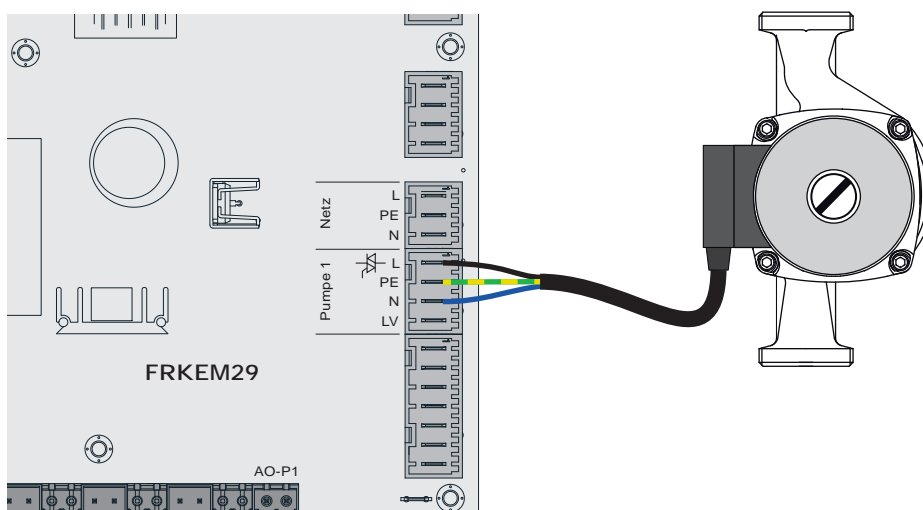
It is not possible to control the speed when using this type of pump. The use of a line regulating valve (e.g.: Setter balancing valve) is recommended.



- ☐ 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)

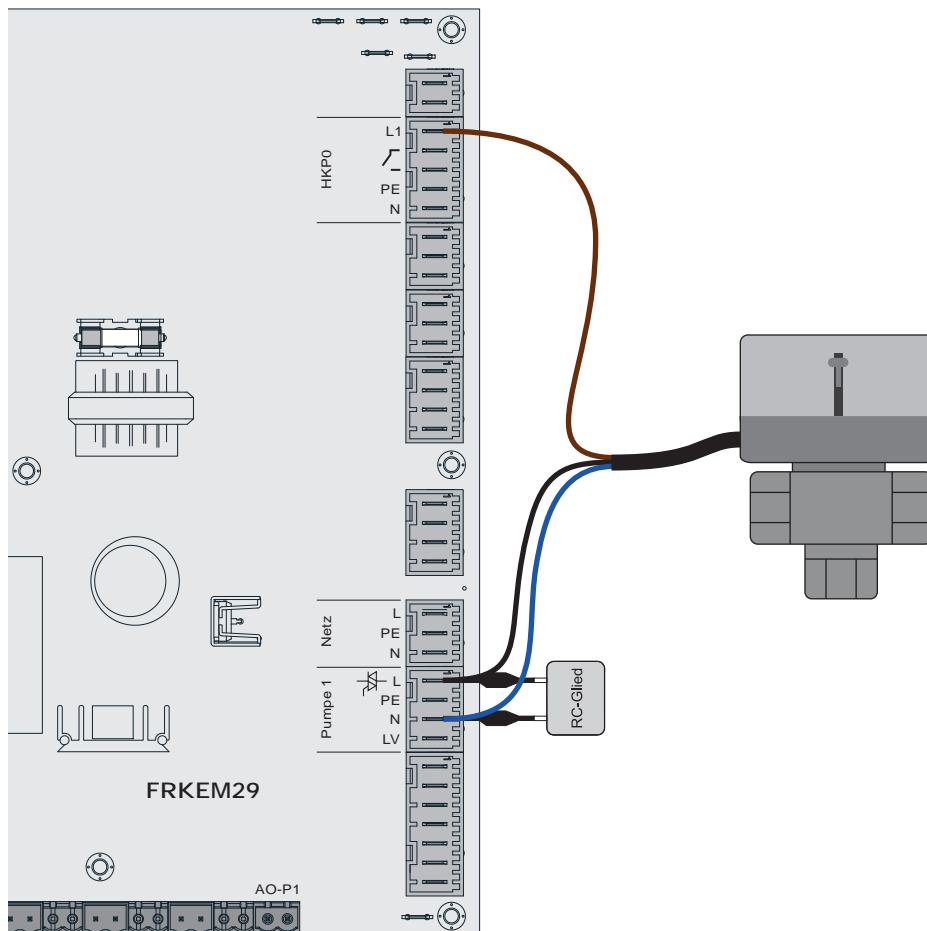
On older pumps without a control signal that are not highly efficient, the speed control is implemented via a pulse package control. Please note that the minimum speed may need to be adjusted on some pumps (default setting: 30%).



- ☐ 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 an isolating valve to the core module

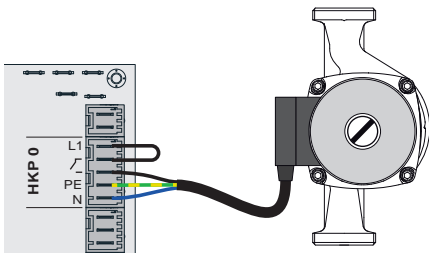
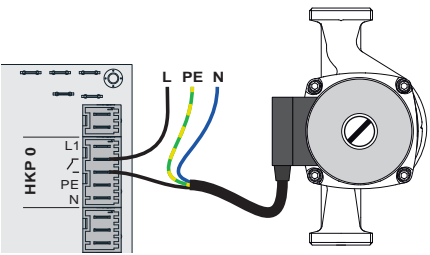
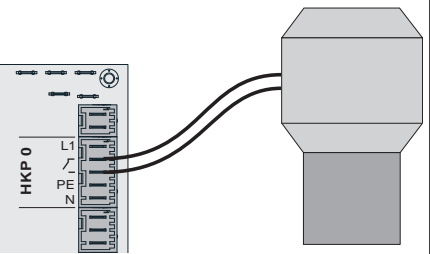
If an isolating valve is connected to the speed-controlled pump outlet, an RC element must be used.



- ☐ Phase (L) for switching the valve and connecting neutral conductor (N) to output "Pump 1" with the RC element
- ☐ Phase (L) for continuous supply (switches the valve back to the initial position) at output "HCP0" – connect terminal "L1"

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 |
|---|---|
|  <p>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.</p> |  <p>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.</p> |
| |  <p>Wire the floating output contact as an enabling signal to control the standby boiler.</p> |

2.1.9 Operating signal

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

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

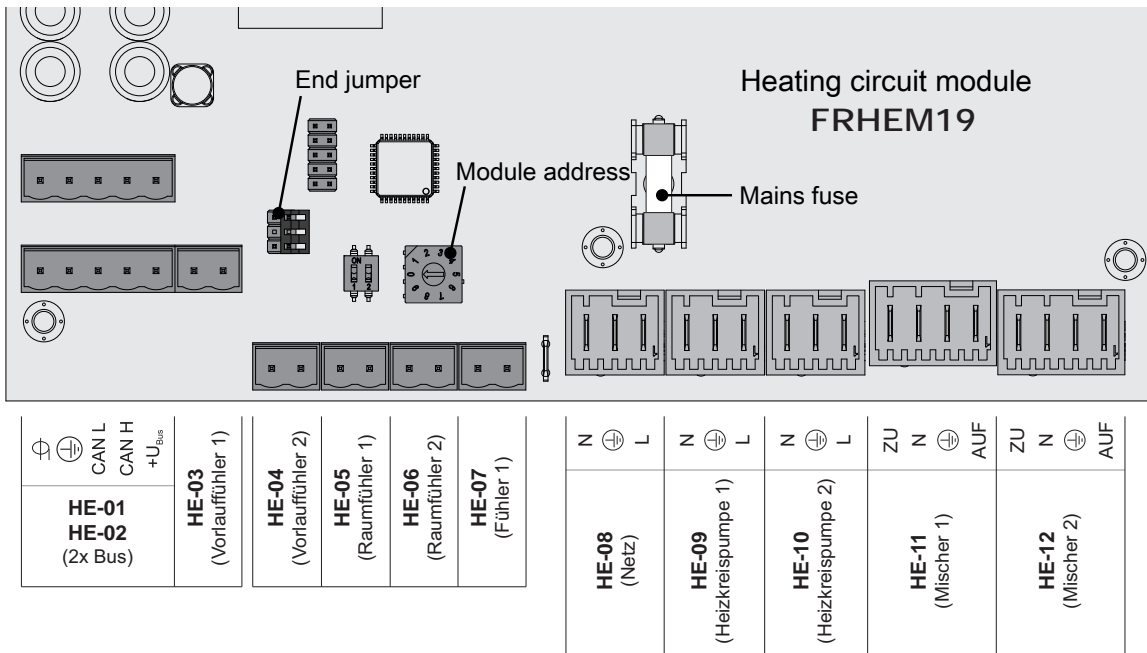
2.2 Expansion modules

2.2.1 Heating circuit module

Two heating circuits can be controlled as standard with the core module.

To add further heating circuits, the heating circuit module boards must be expanded. Expansion can include up to eight heating circuit modules (address 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.

⇒ See "Setting the module address" [page 30]



| Connection / Name | | Note |
|-------------------|---------------------------|---|
| HE-01 | BUS | Connection with cable – LIYCY paired 2x2x0.5; ⇒ See "Connecting the bus cable" [page 29] Caution! CAN L and CAN H must not be connected to +U _{BUS} ! |
| HE-02 | BUS | |
| HE-03 | Flow temperature sensor 1 | Connection cable ¹⁾ 2 x 0.75 mm ² ; |
| HE-04 | Flow temperature sensor 2 | |
| HE-05 | Room temperature sensor 1 | Connection cable ¹⁾ 2 x 0.75 mm ² ; shielded from 25 m cable length |
| 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 this is not to be 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. |
| 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 as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0881-5

Fuses

| | | |
|----|--------|--|
| F1 | 6.3 AT | Mixer 1, mixer 2, heating circuit pump 1, heating circuit pump 2 |
|----|--------|--|

2.2.2 Hydraulic module

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

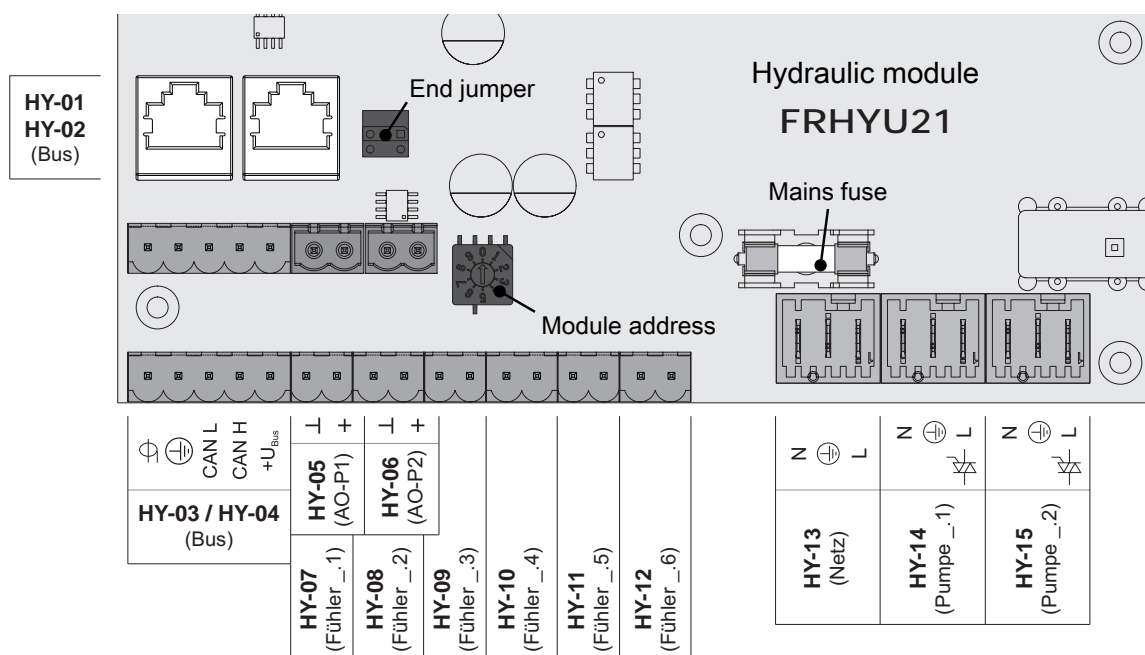
When using the S1 Turbo firewood boiler, the S4 Turbo, and the S4e Turbo with the Lambdatronic S 3200 control, a hydraulic module is included in the delivery as standard (address 0). A further seven modules (addresses 1 to 7) can be retrofitted.

When using the S3 Turbo firewood boiler in conjunction with the S-Tronic Plus or S-Tronic Lambda controller, a hydraulic module is **NOT** included in the delivery (the listed configurations are not available in all countries!). Expansion can include up to eight hydraulic modules (address 0 to 7).

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

You must ensure that the module address is assigned correctly.

⇒ See "Setting the module address" [page 30]

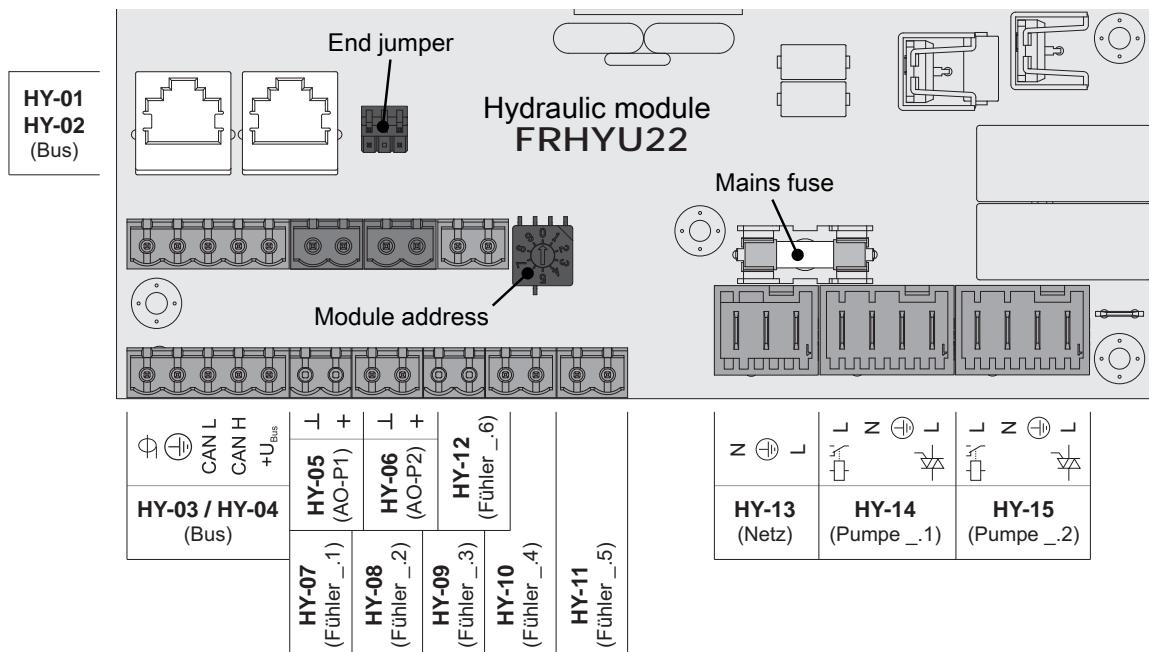
Hydraulic module up to version FRHYU21

| 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; ⇒ See "Connecting the bus cable" [page 29] 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 / Name | | Note |
|---------------------|-----------------------------|--|
| HY-06 | AO-P2 | Connection of the control signal (PDM or 0-10V) of the relevant pump (AO-P1 = pump 1 of the board) |
| HY-07 : HY-12 | Sensor _1 : Sensor _6 | 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-13 | Mains | Connection cable ¹⁾ 3 x 1.5 mm ² , fuse 10A |
| HY-14 | Pump _1 | Connection cable ¹⁾ 3 x 1.5 mm ² , max. 1.5A / 230V / 280W |
| HY-15 | Pump _2 | Pump outlets on 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 |

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

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; ⇒ See "Connecting the bus cable" [page 29] 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 |
| HY-06 | AO-P2 | Connection of control signal for relevant pump |
| HY-07 : HY-12 | Sensor _1 : Sensor _6 | 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-13 | Mains | Connection cable ¹⁾ 3 x 1.5 mm ² , fuse 10A |
| HY-14 | Pump _1 | Connection cable ¹⁾ 3 x 1.5 mm ² , max. 1.5A / 230V / 280W |

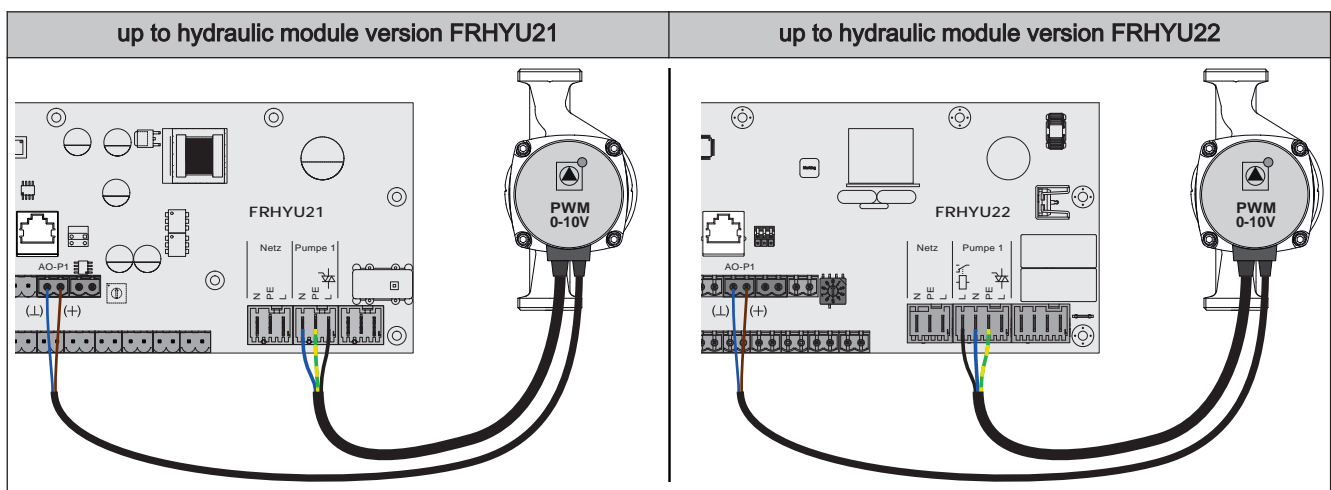
| Connection / Name | | Note |
|--|---------|---|
| HY-15 | Pump _2 | <p>Pump outlets on board. The correct pump designation is determined by the set module address (0-7). Example: module address "2" = pump 2.1 and pump 2.2</p> <p>Depending on the type of pump, the phase (L) is either connected to the relay output or triac output.</p> <p>⇒ See "Connecting a circulating pump to the hydraulic module" [page 19]</p> |
| 1. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0881-5 | | |

Connecting a circulating pump to the hydraulic module

CAUTION! 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 (PDM / 0-10V)

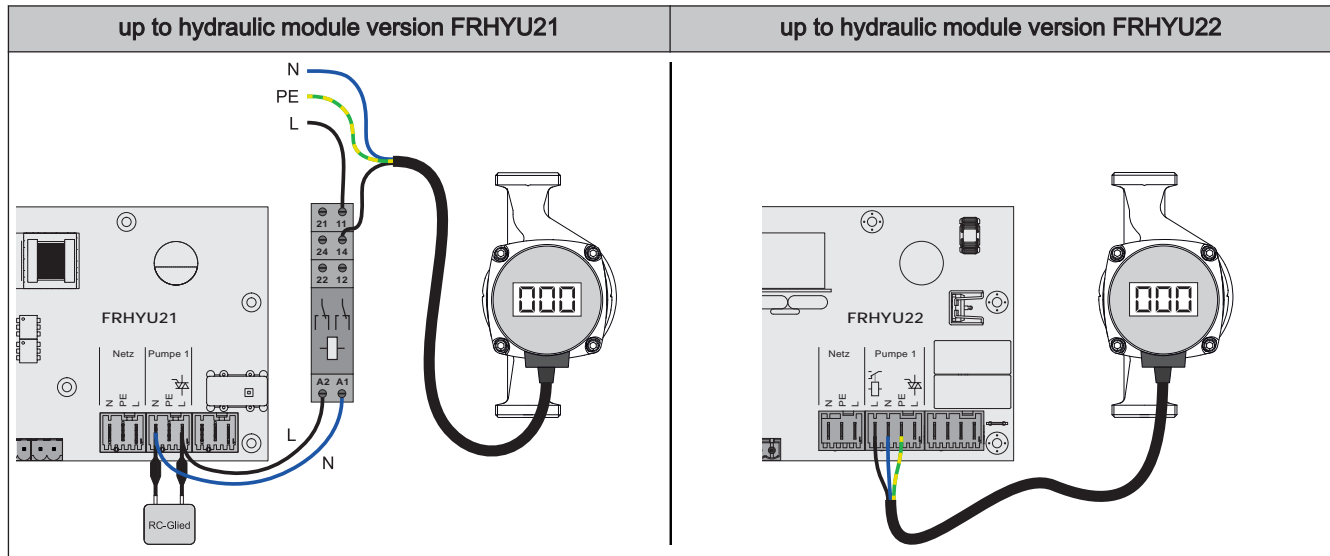
On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PDM or 0-10V signal.



- ☐ **Hydraulic module FRHYU21:** Connect the power supply for the high efficiency pump to output "Pump 1" or "Pump 2"
- ☐ **Hydraulic module FRHYU22:** 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 PDM 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 / PDM" or "Field pump / 0-10V"

High efficiency pump without control signal

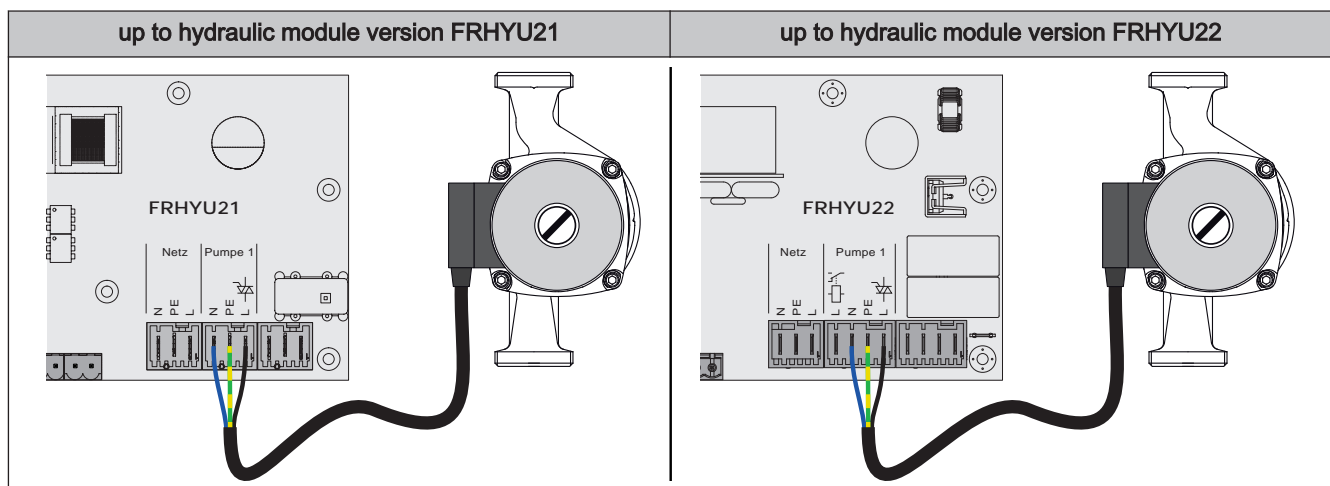
It is possible to control the speed when using this type of pump. The use of a line regulating valve (e.g.: Setter balancing valve) is recommended.



- ☐ **Hydraulic module FRHYU21:** Connect pump with relay and RC element isolated from the output
- ☐ **Hydraulic module FRHYU22:** 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%).



- ☐ **Hydraulic module FRHYU21:** Connect the power supply for the pump to output "Pump 1" or "Pump 2"
- ☐ **Hydraulic module FRHYU22:** 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"

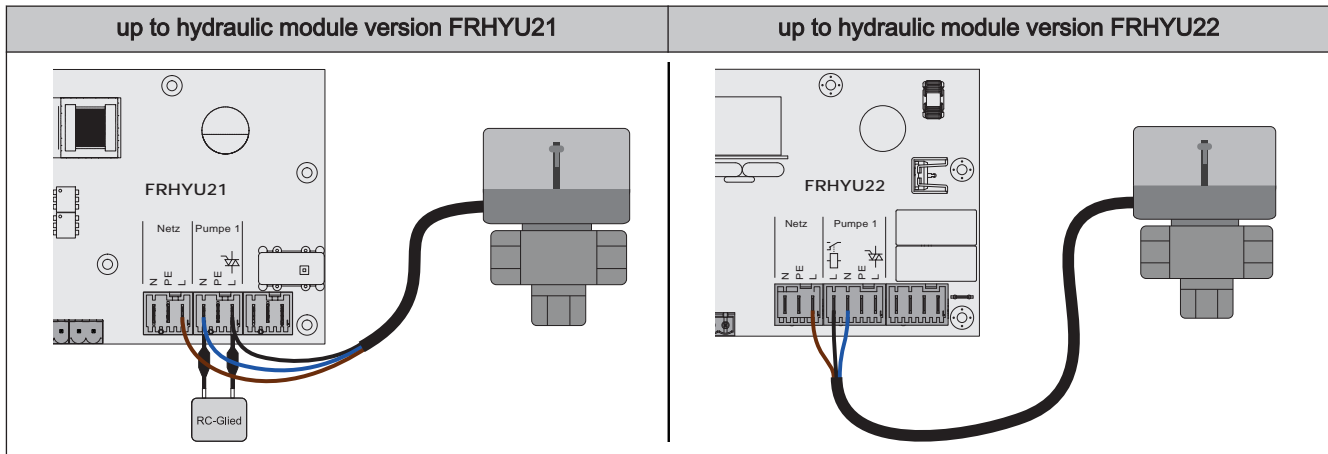
up to hydraulic module version FRHYU21

- up to hydraulic module version FRHYU22
-
- The diagram illustrates the electrical connection for the FRHYU22 hydraulic module. The FRHYU22 control unit is connected to a terminal block. The terminal block has terminals for 21, 24, 22, 11, 14, 12, A2, and A1. The FRHYU22 unit has terminals for AO-P1, Netz (L, N, PE), and Pumpe 1. The hydraulic module has terminals for IN, S/S, and L. The wiring connects the FRHYU22 unit to the terminal block, which then connects to the hydraulic module. A 230 VAC power supply is connected to the terminal block via a cable with PE, N, and L wires.

- Service manual Lambdatronic S 3200 & S-Tronic Plus/Lambda | B1410822_en

Connecting an isolating valve to the hydraulic module

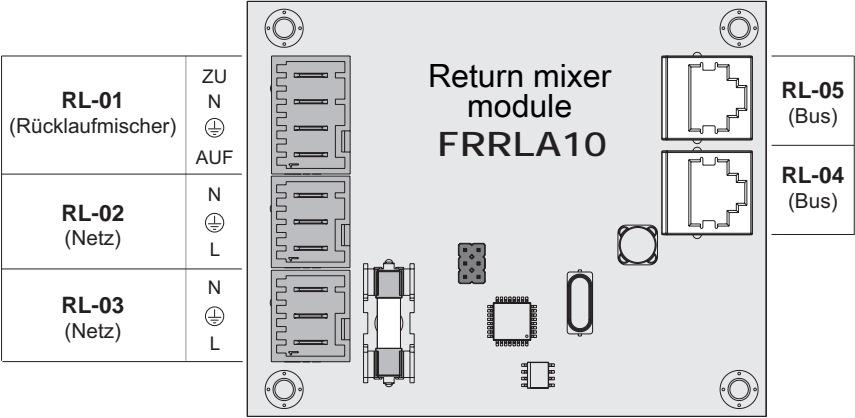
CAUTION! As of module version FRHYU22, one relay output is available at each of the pump outlets in addition to the triac output. Observe the following connection diagrams for the correct wiring.



- ☐ **Hydraulic module FRHYU21:** Phase (L) for switching the valve and connecting neutral conductor (N) to output “Pump 1” or “Pump 2” with the RC element
- ☐ **Hydraulic module FRHYU22:** 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".



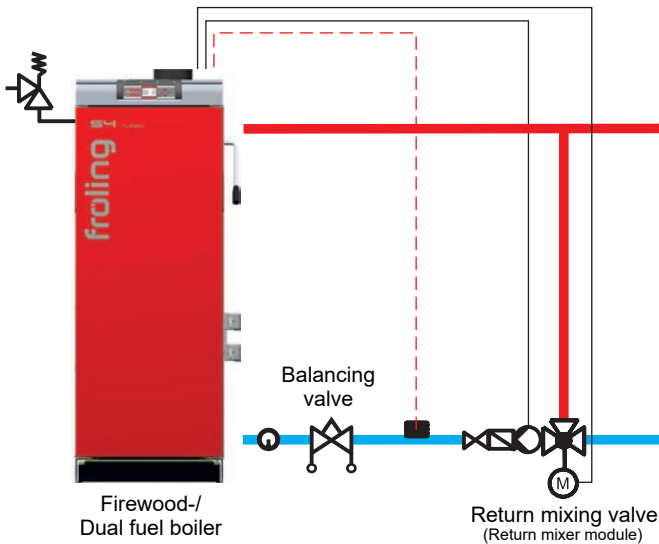
| Connection / Name | | Note |
|-------------------|--------------|---|
| RL-01 | Return mixer | Connection cable ¹⁾ 4 x 0.75 mm ² , max. 0.15A / 230V |
| RL-02 | Mains | |
| RL-03 | Mains | |
| RL-04 | Bus | Patch cable CAT 5 RJ45 SFTP 1:1 configuration, included in delivery |
| RL-05 | Bus | |

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

Fuses

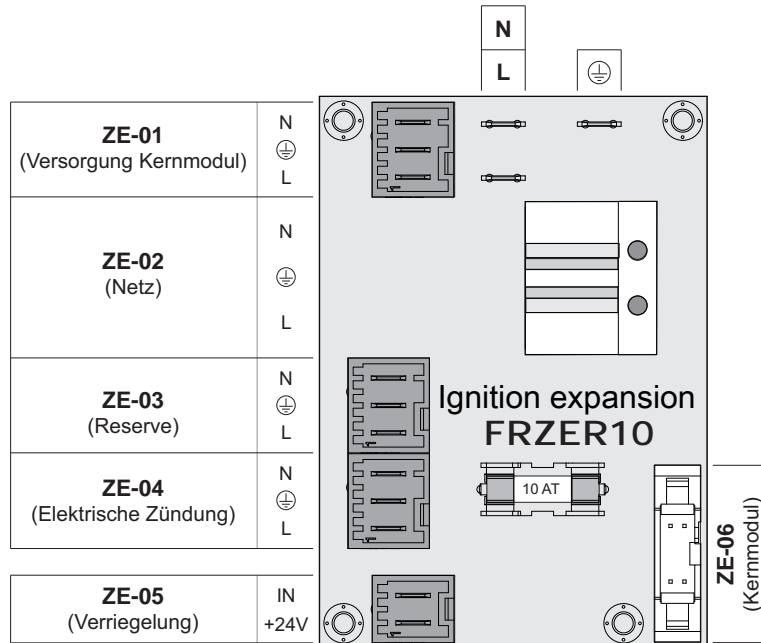
| | | |
|----|--------|--------------|
| F1 | 6.3 AT | Return mixer |
|----|--------|--------------|

Connection example



2.2.4 Ignition expansion

The ignition expansion makes the connection for an electrical ignition fan available and makes it possible for 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.

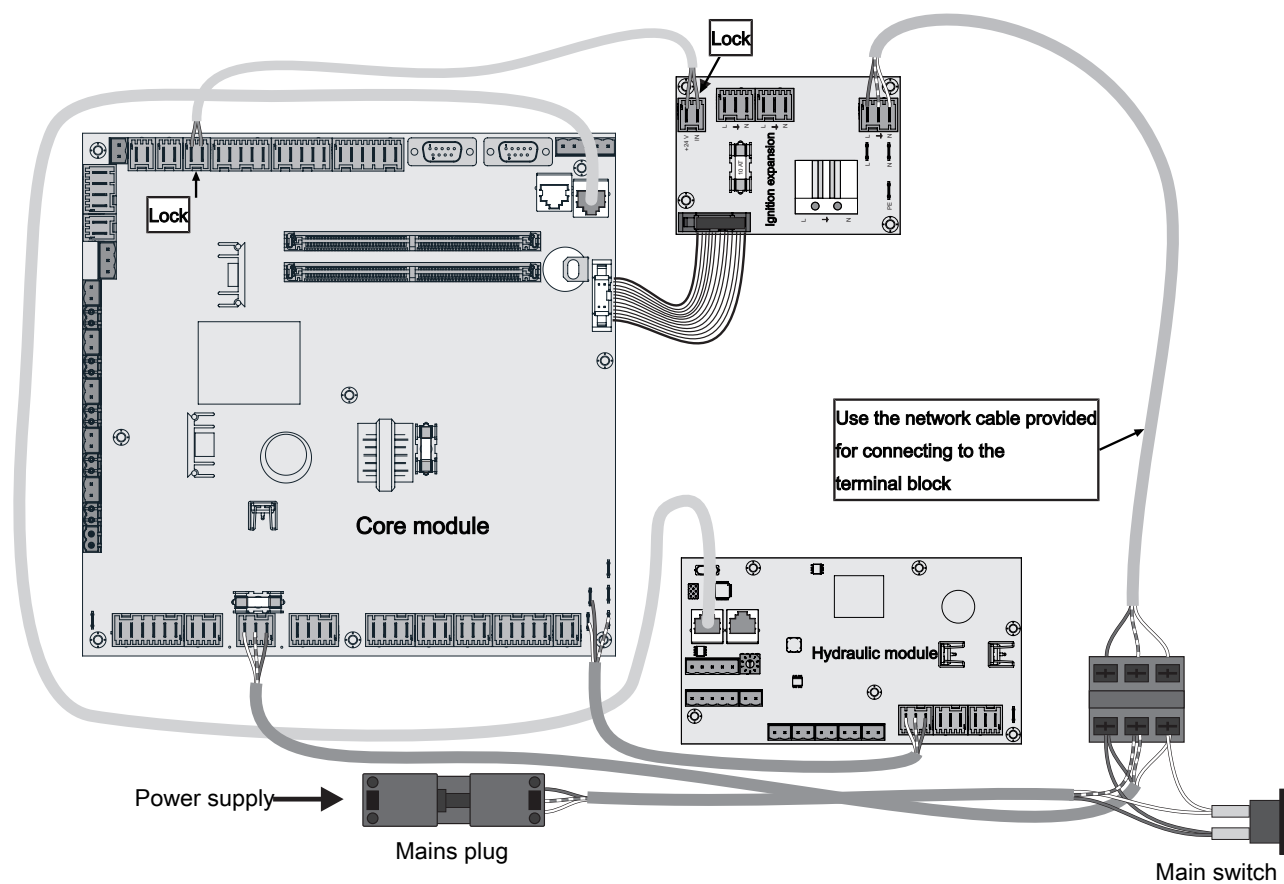


| Connection / Name | | Note |
|-------------------|--------------------------|--|
| ZE-01 | Core module power supply | Connection cable ¹⁾ 3 x 1.5 mm ² |
| ZE-02 | Mains | Connection cable ¹⁾ 3 x 1.5 mm ² |
| ZE-03 | Reserve | S4e Turbo with automatic WOS: Connection cable ¹⁾ 3 x 1.5 mm ² |
| | WOS drive | |
| 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 looping through |
| ZE-06 | Core module | Use the supplied ribbon cable |

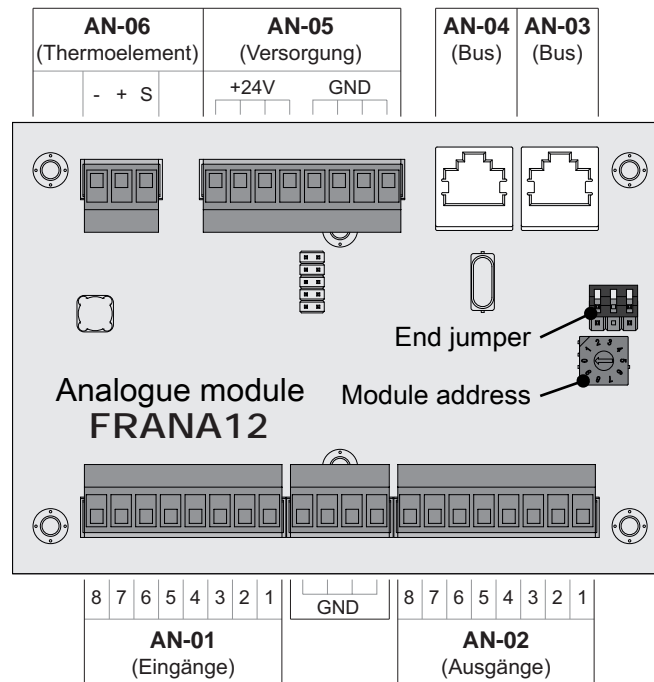
1. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0881-5

Fuses

| | | |
|----|-------|----------|
| F1 | 10 AT | Ignition |
|----|-------|----------|

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: ⇒ See "24 V power supply" [page 27] - pellet boiler and dual fuel boiler: Pellet module, "MIN sensor" terminal - Wood chip boiler: Supply via 24 V power supply unit |
| AN-06 | Thermocouple | Use sensor connection |

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

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 “Source for ext. power demand (0 – off, 1 – 0–10 V, 2 – modbus)” parameter. 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.

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).

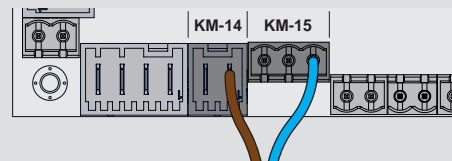
Necessary parameters for setting the power demand can be found in the “Boiler – General settings” menu.

24 V power supply

When used in a firewood boilers, connect the 24 V supply as follows:

24 V power supply

- brown: 24 V (+) to core module KM 14
- blue: 24 V (-) to core module KM 15

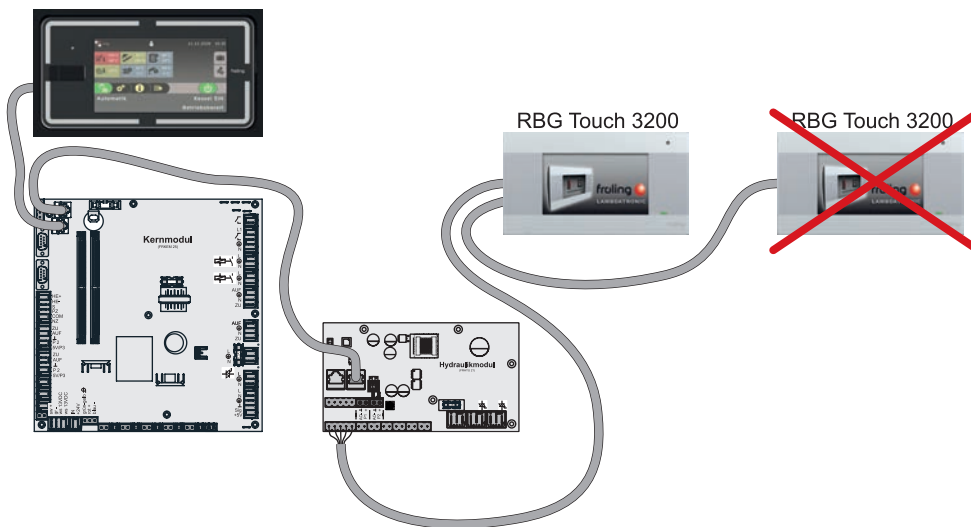


2.3 BUS connection

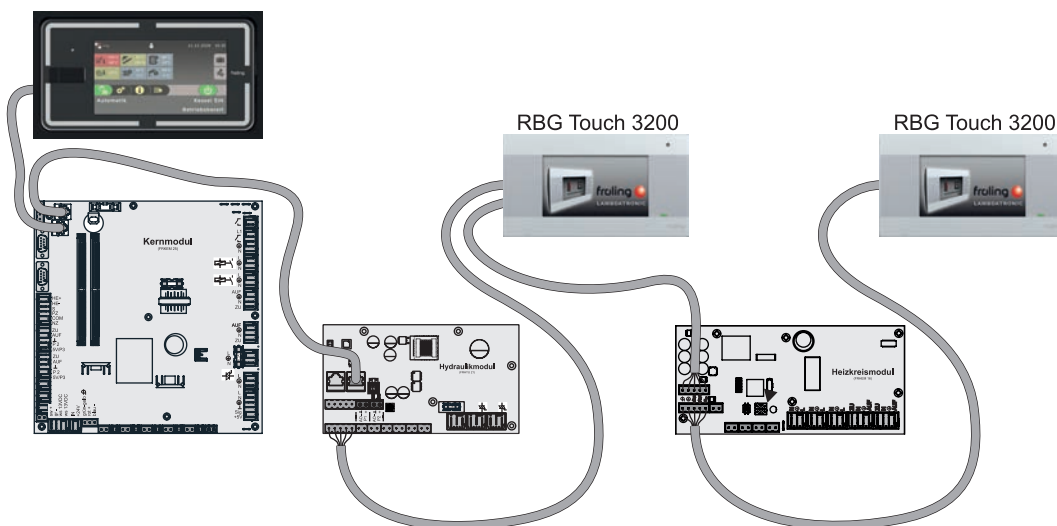
All of the bus models are connected with a bus line. The specification of the cable that is used must adhere to the LIYCY 2x2x0.5 type. A maximum cable length of 200 m must be observed. The cable length can be extended using the Fröling bus repeater.

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

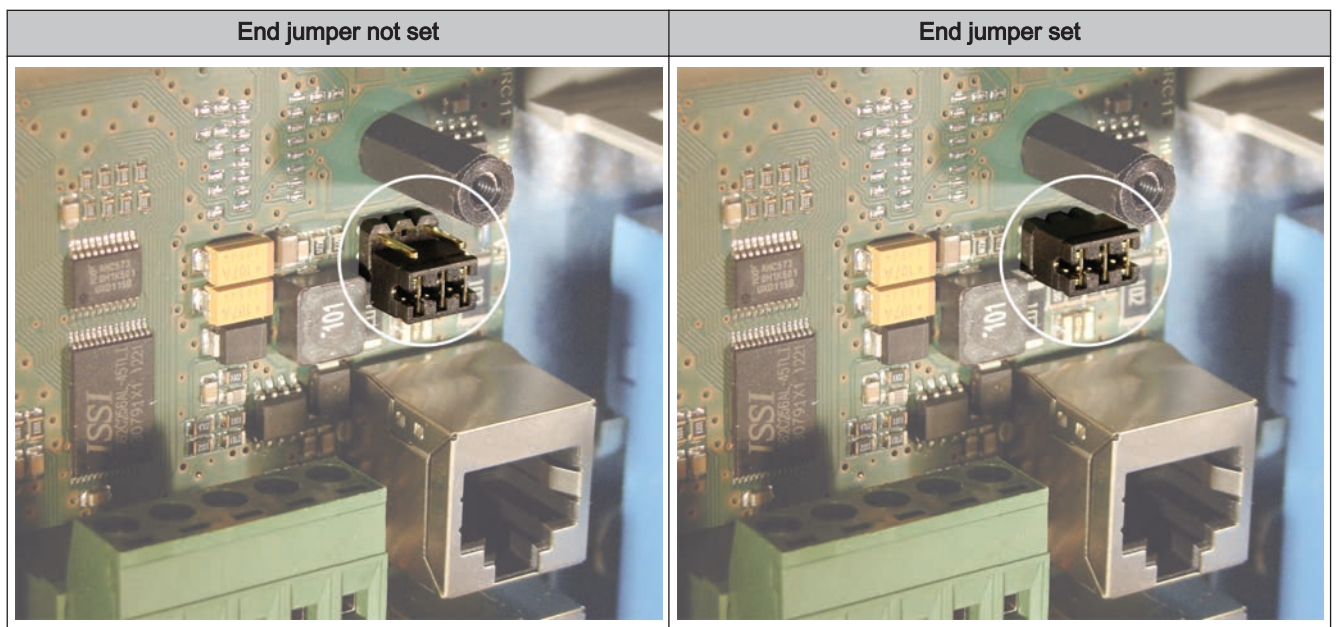
For the bus connections between the individual modules, cable type **LIYCY paired 2x2x0.5** should be used. The connection to the 5-pin plugs should be carried out according to the following diagram:



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.

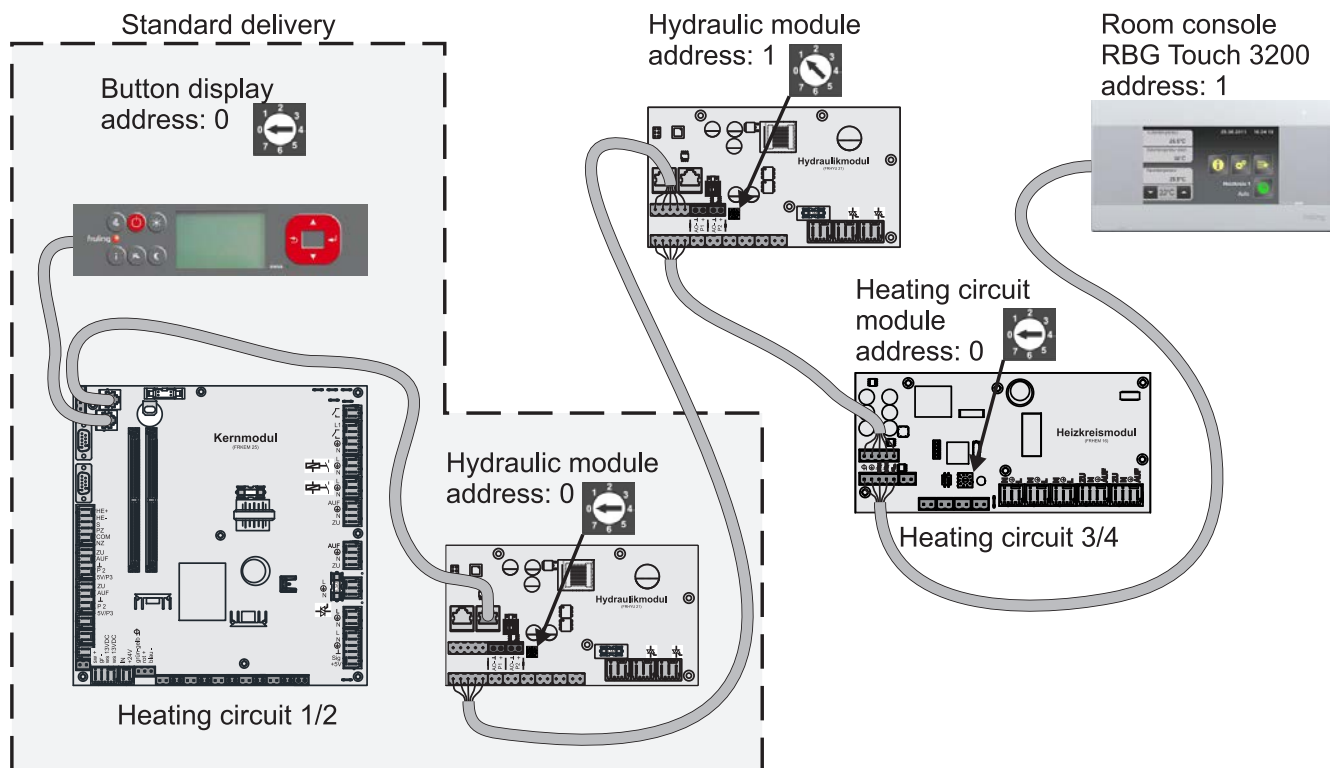
2.3.3 Setting the module address

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.

When using the S1 Turbo firewood boiler, the S4 Turbo, and the S4e Turbo with the Lambdatronic S 3200 control, a hydraulic module is included in the delivery as standard (address 0). A further seven modules (addresses 1 to 7) can be retrofitted.

When using the S1 Turbo firewood boiler and S3 Turbo in conjunction with the S-Tronic, S-Tronic Plus and S-Tronic Lambda controller, a hydraulic module is **not** included in the delivery. (The configurations listed are not available in all countries!). Expansion can include up to eight hydraulic modules (address 0 to 7).

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

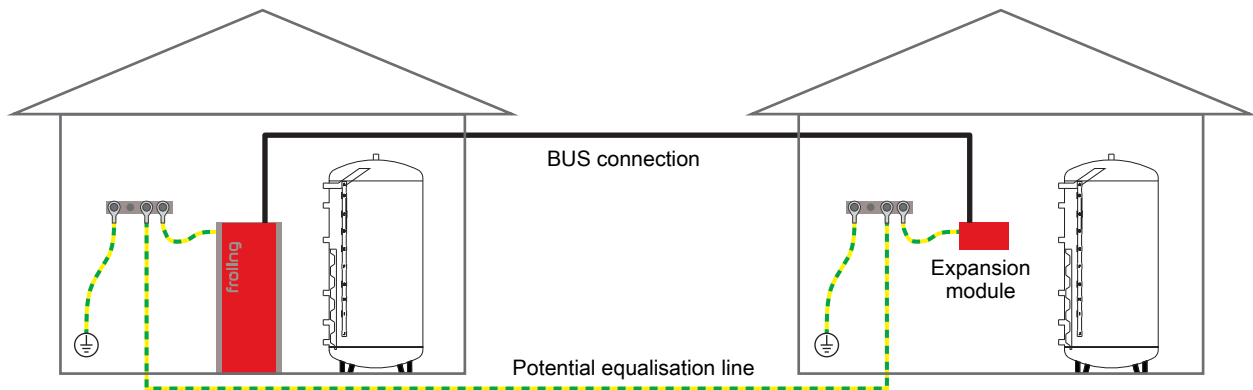


| Module address set | Heating circuit module | Hydraulic module | |
|--------------------|------------------------|------------------|-----------|
| | Heating circuit | Sensors | Pump |
| 0 | 03 – 04 | 0.1 – 0.6 | 0.1 – 0.2 |
| 1 | 05 – 06 | 1.1 – 1.6 | 1.1 – 1.2 |
| 2 | 07 – 08 | 2.1 – 2.6 | 2.1 – 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

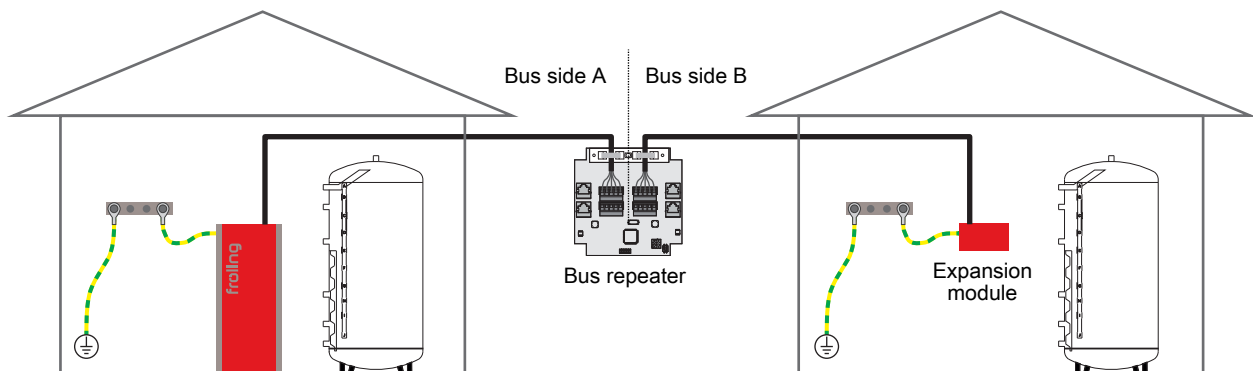
There can be potential shifts between buildings. In this case, equalising currents flow via the bus connection shield which can damage the modules.

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.

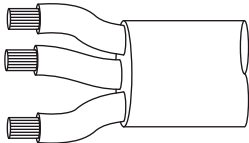
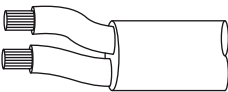
Instead of the potential equalisation, a Fröling bus repeater can be used in the bus connection line to the next building. The potential separation (galvanic isolation) allows the bus network to be split into two separate sub-networks.



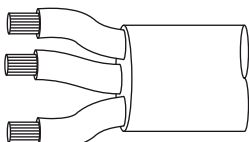
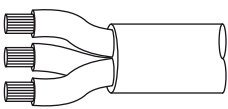
2.4 Connection information according to pump types

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:

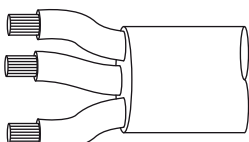
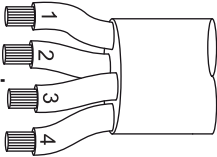
Pump type with 2-pin control cable

| 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

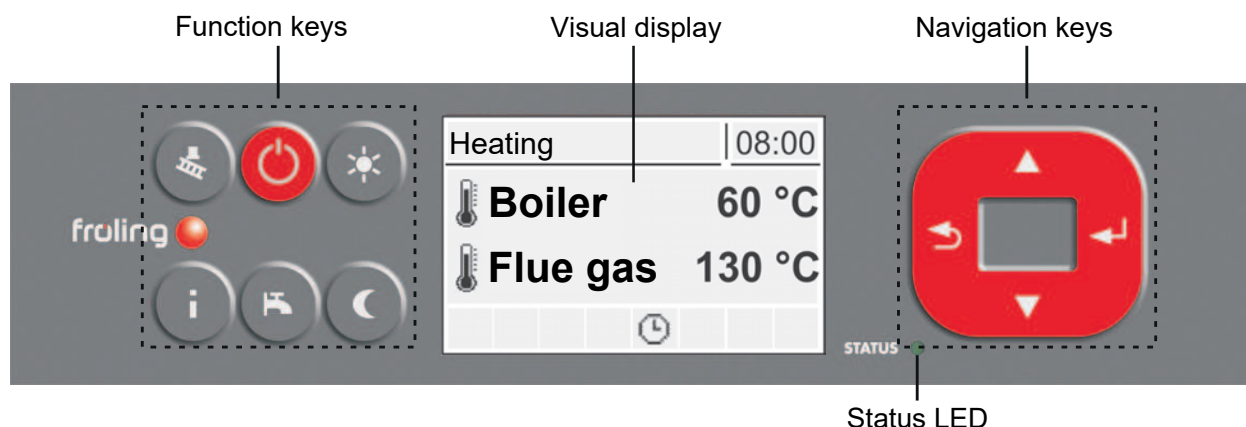
| Power supply | 3-pin control cable |
|---|---|
| (brown) L (blue) N (yellow/green) PE  | <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 10px;"> PWM not used </div> <div> (blue) ⊥ (brown) + (black)  </div> </div> |
| Wire the power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

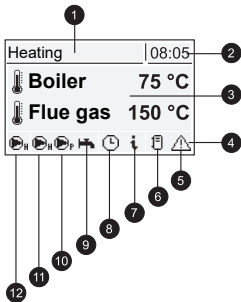
| Key | Function for | |
|---|-------------------------------------|--|
|  UP arrow | navigation: move up a menu level | |
| | parameter change: | depending on how long the key is pressed: - short: increase value - long: increase value in increments of 10 - long (>10 secs): increase value in increments of 100 |
|  DOWN arrow | navigation: move down a menu level | |
| | parameter change: | depending on how long the key is pressed: - 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: - 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:

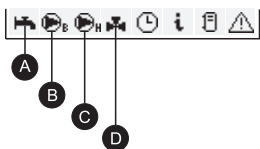
- GREEN flashing (interval: 5 sec OFF, 1 sec ON): Off
- GREEN constant: **BOILER SWITCHED ON**
- ORANGE flashing: **WARNING**
- RED flashing: **FAULT**

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 ⇒ See "Function keys" [page 35] | |
| 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

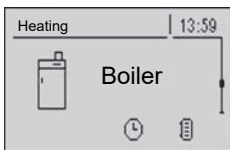
long keystroke > 4 sec

3.2.1 Info key

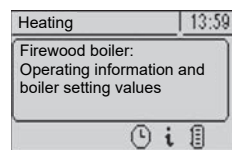
| Keystroke | | Function |
|---|-------|---|
|  | short | Shows plain text information about the menu items or fault messages |
| | long | Choose language: Deutsch, English, Francais, Italiano, Slovenski, Cesky, Polski, Svenska, Espanol, Magyar, Suomi, Dansk, Nederlands, Russian, Serbian |

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:

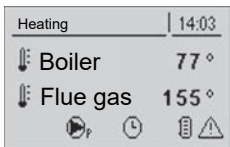


In normal operation (without pending fault messages) the info key can be pressed to display information or an explanation for every menu item or parameter.

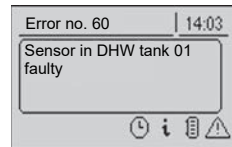


The info text is also identified by the frame and the info symbol in the status line.

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:

⇒ See "Troubleshooting" [page 97]


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>⇒ See "System - Boiler mode" [page 95]</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>⇒ See "System - Boiler mode" [page 95]</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

⇒ See "Mains connection" [page 9]

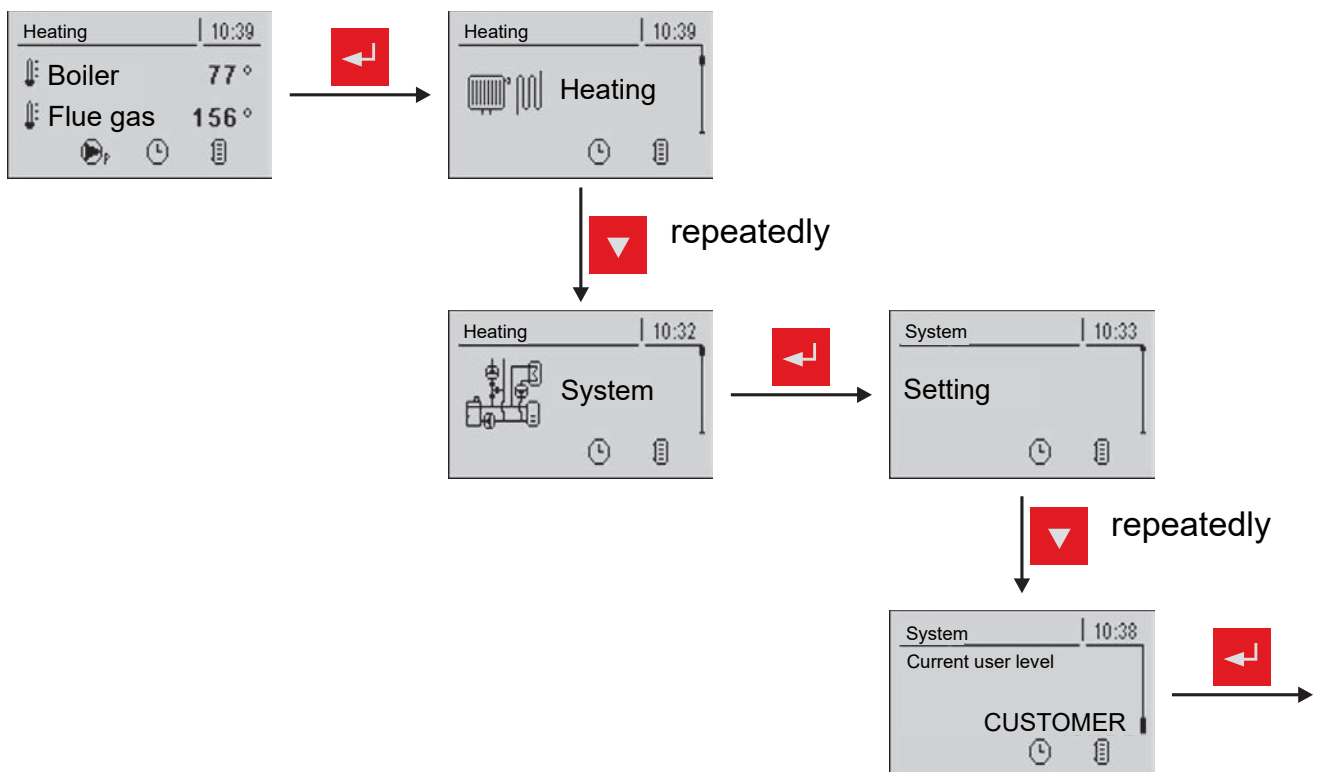
4.2 Initial startup

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")

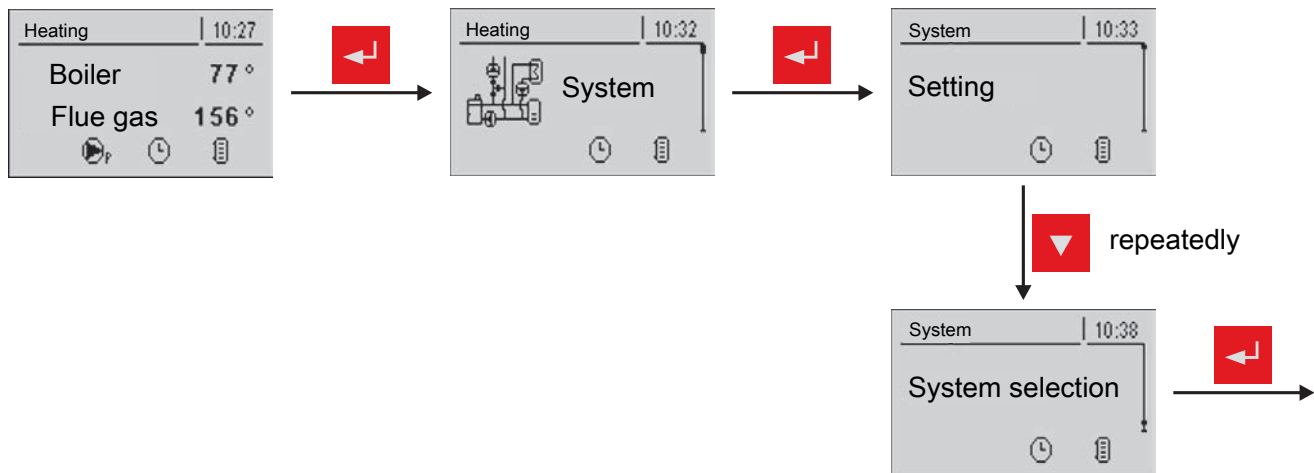
Standard user level for normal operation of the display. All customer-specific parameters are displayed and can be changed.

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.

Air control with one actuator



If only one actuator is installed for air control on the boiler (S1 Turbo with Lambdatronic S 3200), then this parameter must be activated.

Connection: Secondary air on the core module

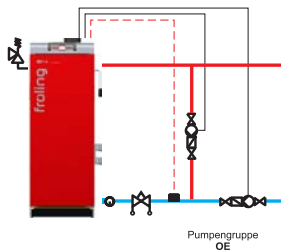
Ignition type

Indicates which automatic ignition is being used.

Ignition available

If the automatic hot air ignition is installed on the S4 Turbo firewood boiler, or the ceramic igniter on the S1 Turbo / S3 Turbo firewood boiler, then this parameter must be activated.

Bypass pump installed



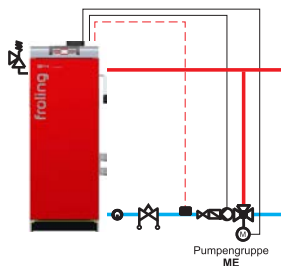
If the return temperature control is by way of bypass pump, then this parameter must be activated.

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

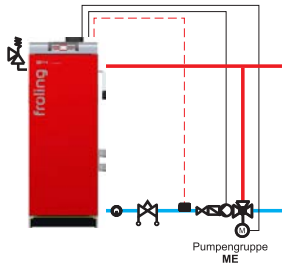


If the return temperature control is by way of mixing valve and the control is carried out via the heating circuit 1 on the core module, then this parameter must be activated.

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)

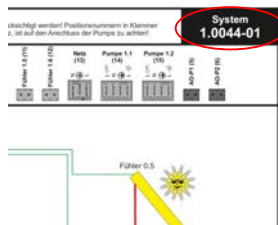
Boiler heat quantity recording method

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.

⇒ See "Hydraulic system for S-Tronic Plus / S-Tronic Lambda" [page 46]



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:

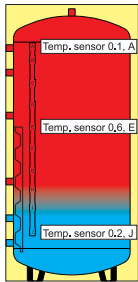
| | System-specific components | | | | | | | | Additional functions | | | | | | | | |
|-----------------------------|----------------------------|----------|---------------------|----------------------------|------------------------------|------------------------------|-------------------------|----------------------------|----------------------------|---------------------|------------------------|--------------|--------------------------------|--------------|------------------|------------------------------|--------------|
| | 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 features | 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 Froling 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.

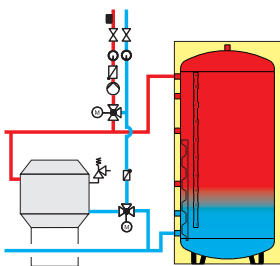
Number of sensors for storage tank 1 with multi-sensor management

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

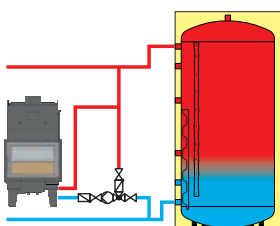
Using this parameter it can be set whether a standby boiler, if present, should run at the same time (if required) as the Froling boiler. If parallel mode is permitted (each boiler has its own chimney system; country-specific) or required, this parameter must be activated.

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 Froling 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

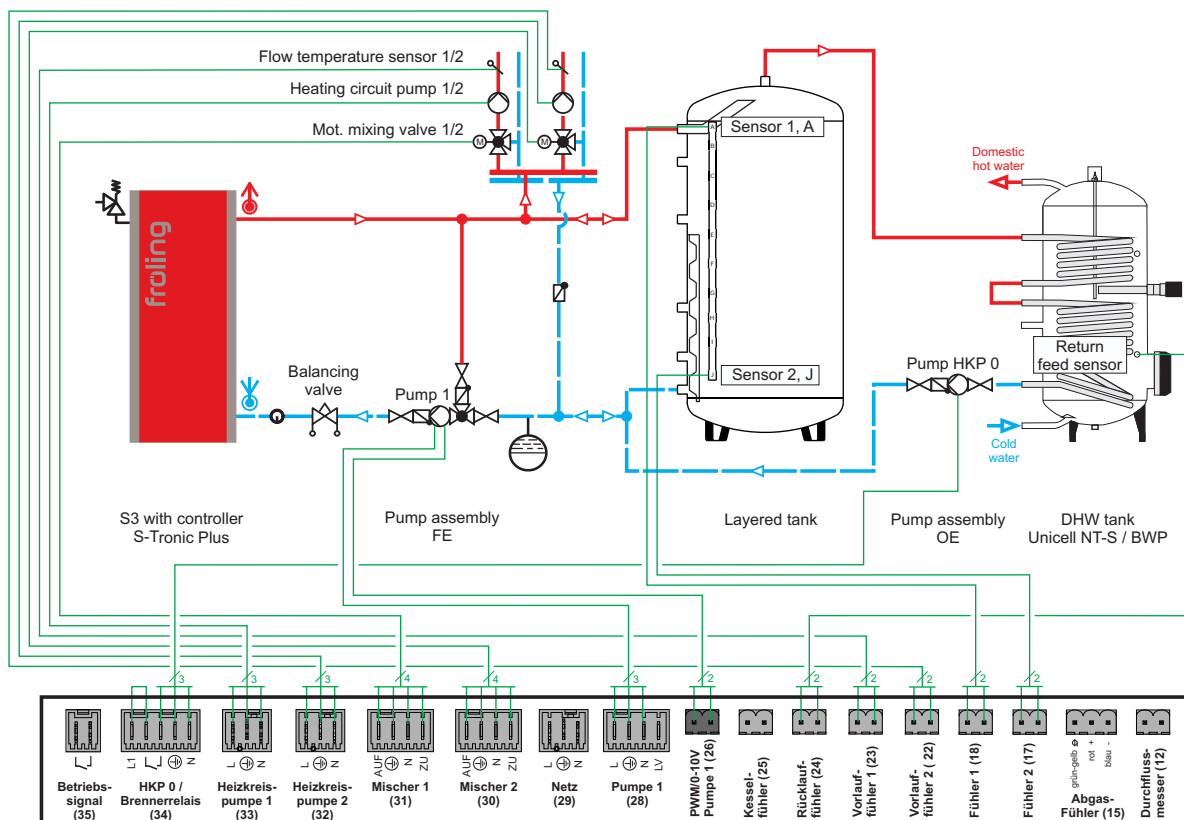
Remote control of the boiler can be activated

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



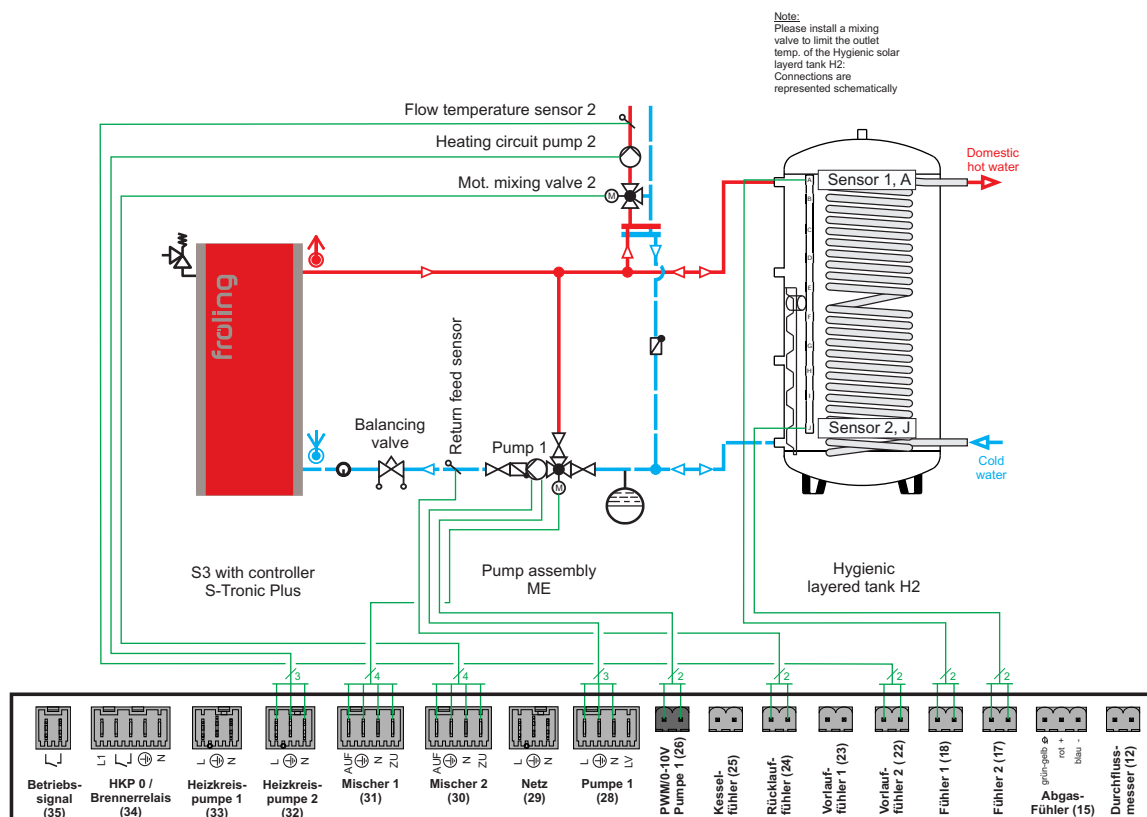
☐ Select “Hydraulic system for S-Tronic” system

➤ 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

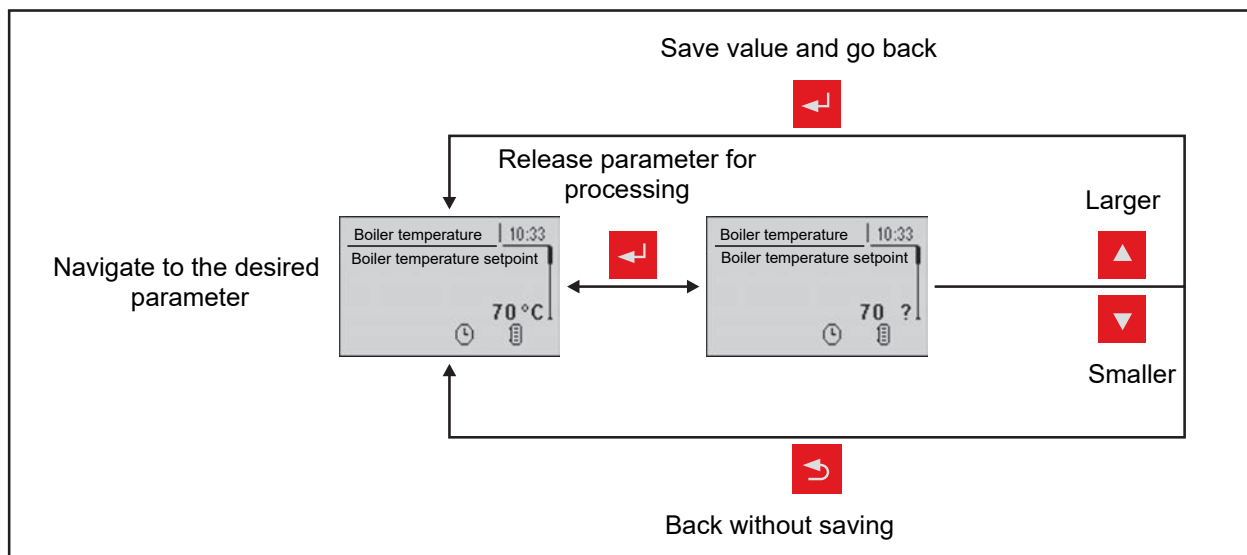
4.3 Operating statuses

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:

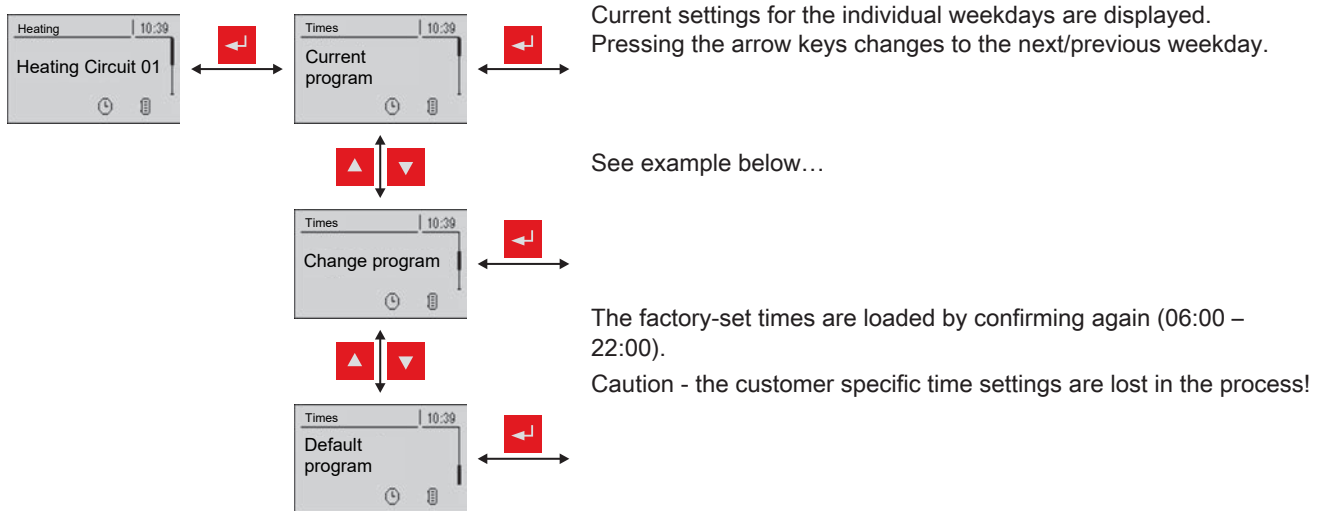
- **Desired boiler setpoint**
- **DHW tank loading times**
- **Solar controller**
- **Heating and setback times of the individual heating circuits**

4.5 Setting times

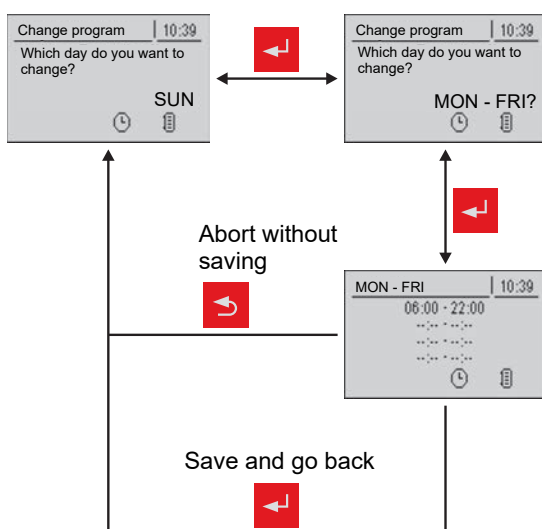
The desired time window for the component can be set in the "Times" submenu in the individual menus of the heating components (heating circuits, DHW tanks ...). The structure of the time menu and the procedure for changing the times are always the same.

Example - Setting times for heating circuit 01:

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



... In the "Change program" menu:



After pressing the enter key you can select the day or the time period, for which the heating times are to be set:

- MO, TU, ..., SU
- MO - FR
- SA - SU
- SAME ALL DAYS

After pressing the enter key again the time window for the desired day/time period is displayed.

Up to 4 different heating times can be entered sequentially here.

When the enter key is pressed, the cursor jumps to the next position, even if no time has been entered. If the cursor is in the last position, pressing the enter key saves the time window and switches to the previous 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



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

Actual flow temperature

Display of the current flow temperature.

Flow temperature setpoint

Display of the calculated flow temperature setpoint.

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

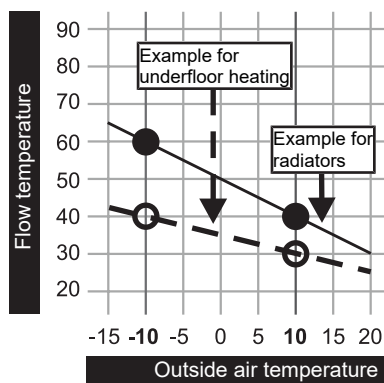
Room temperature which is regulated outside of the set heating times.

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 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 storage tank top should the overheating protection be activated?

If the temperature at top storage 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

Basic display ➡ Heating ➡ Heating circuit 1 ➡ Times

⇒ See "Setting times" [page 50]

5.1.4 Heating - Service

Basic display ➡ Heating ➡ Heating circuit 1 ➡ 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.

NOTICE! To avoid mixer vibration, do not set value < 150s!

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 only available for heating circuit 1 and 2!

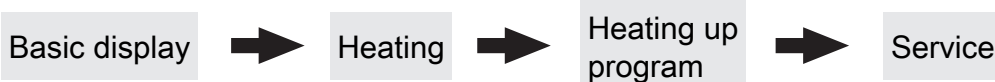
Set Pellet as the unit model for "DHW tank 1" in the case of pellet boiler PE1!

- **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

High temperature requirement because of DHW tank loading

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 "Load if temperature difference between boiler and DHW tank is" criterion is reached. 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

**Heating up program active**

- **NO:** Heating up program deactivated, all heating circuits are operated according to the selected heating times.
- **YES:** The 30-day heating up program that has been set starts. After the 30 days, the heating circuit that has been selected operates based on the set heating times again.
- The heating times of the selected heating circuit, as well as the boiler/buffer tank loading times are automatically set to 0:00-24:00 and the outside air temperature heating limit is ignored.
- When using a firewood boiler, a corresponding 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.

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 jump 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.

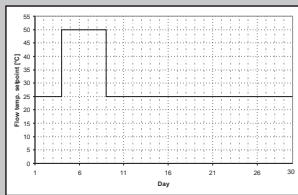
Heating up program 8 allows you to pre-define the progression of the flow temperature for each individual day.

Outfeed setpoint for all days in program 7

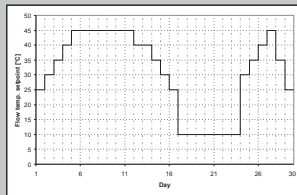
If heating up program 7 is active, the selected heating circuit is adjusted to the specified flow temperature.

Heating up programs

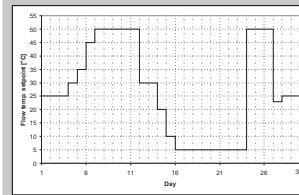
Heating up program 1:



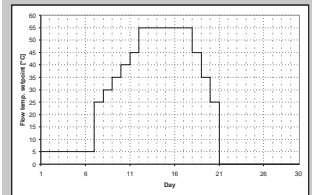
Heating up program 2:



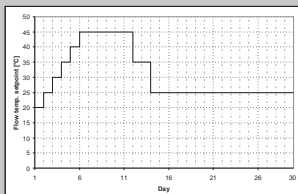
Heating up program 5:



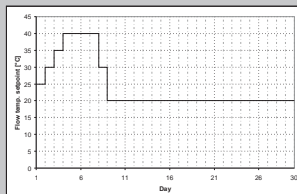
Heating up program 6:



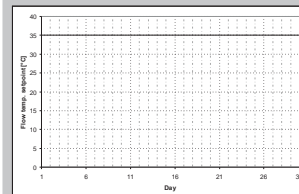
Heating up program 3:



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

Basic display



Heating



Heating up program



Service



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

Basic display



Heating



Heating up program



Service



Heating circuits used

Using heating circuit 01 ... 18

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

The heating up program selected will be used for all heating circuits!

5.1.6 Heating - General settings

Basic display ➡ Heating ➡ General settings

Correction value for external sensor

If a deviation of the outside temperature is determined from the evaluated value to the displayed value, the evaluation of the outside 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.

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

Basic display ➡ 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 storage tank and DHW tank is

If the top storage tank temperature is above the current DHW tank temperature by this value and the time window is active, DHW tank loading starts (only for systems with a storage tank).

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 storage 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 storage tank).

5.2.3 Water - Times

Basic display ➡ Water ➡ Times

⇒ See "Setting times" [page 50]

5.2.4 Water - Service

Basic display ➡ 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 storage 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 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:** A DHW loading takes place always when the DHW tank temperature falls below the value, which 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 the DHW tank has already been loaded once on the current day, a 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 tank pumps 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 top sensor

Sensor input to which the DHW tank sensor is connected.

Sensor input of DHW tank 01 solar reference sensor

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

Pump output of DHW tank 01 pump

Pump outlet to which the boiler loading pump is connected.

Control of DHW tank pump

Definition of control signal for pump type used.

⇒ See "Activation options of pump outlets" [page 98]

Minimum DHW tank speed

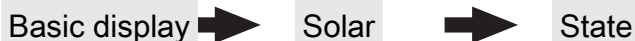
Adjustment of the minimum speed to the pump type (set mode of pump in accordance with pump manufacturer).

Maximum DHW tank pump speed

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

5.3 Solar

5.3.1 Solar - Status



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.

Today's yield [kWh]

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

Daily yield 1 ... 6 days ago [kWh]

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.

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.

Collector pump control

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

Pump between heat exchanger and buffer tank

Prerequisite: Hydraulic system 12 or 13

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

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

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

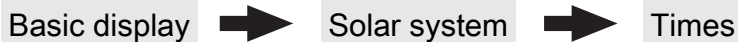
This is the overcharge for the collector pump controller for the top or bottom temperature in the buffer tank.

Top storage 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 storage tank is reduced.

5.3.3 Solar system - Times



The solar panel system pump is allowed to start from

If the criteria for starting the collector pump have been reached from 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



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 collector pump

Definition of control signal for pump type used.

⇒ See "Activation options of pump outlets" [page 98]

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 you need to limit the maximum speed of the collector pump for systemic reasons, 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 is kept on. 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 only starts when the criteria 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 is kept on. If no temperature increase on the collector sensor is detected, the collector pump switches off and the time starts to run afresh.

For solar to store and DHW tank, the DHW tank has priority

- **YES:** The DHW tank is loaded until the temperature set under "Set DHW temperature during solar charging" is reached. Only then does it switch to the storage tank by means of the switch valve.
- **NO:** The DHW tank is charged 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 storage 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 storage tank

This parameter defines the storage 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 storage 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 storage 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 collector return sensor

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

Pump output of solar isolating valve

Pump outlet to which the solar isolating valve is connected.

Pump output of storage 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 storage tank – heat exchanger pump

Prerequisite: Hydraulic system 12 or 13

Definition of control signal for pump type used.

⇒ See "Activation options of pump outlets" [page 98]

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.

⇒ See "Activation options of pump outlets" [page 98]

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 storage tank. If there is not 230V at this output, the valve clears the way to the storage tank solar element or the lower area of the storage 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).

Minimum pump speed secondary HE

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

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 [kWh]

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 sensor**

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 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 through counter used

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

5.4 Buffer tank

5.4.1 Buffer tank - 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 difference between boiler setpoint and top buffer is larger

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

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 – storage tank difference

Prerequisite: Variant 3

Difference, which must be given for loading a storage tank e.g. in an adjacent building. If this difference is not reached, the storage 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:** Release of heating circuit pump 0 according to the boiler temperature parameter "Minimum boiler temperature to release all pumps"
- **YES:** Release of heating circuit pump 0 according to the temperature in the top part of the buffer tank parameter "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. 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 storage tank top sensor

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

Sensor input of storage tank sensor 2-7

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

Sensor input of storage tank middle sensor

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

Sensor input of storage tank bottom sensor

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

Pump output of storage tank pump

Pump outlet to which the buffer loading pump is connected.

Control of storage tank pump

Definition of control signal for pump type used.

⇒ See "Activation options of pump outlets" [page 98]

Minimum storage 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 you need to limit the maximum speed of the store loading pump for systemic reasons, 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 storage tank volume set here is used for calculating the required amount of fuel for loading the storage tank.

If the boiler is active then charge all storage tanks

Prerequisite: Variant 3 or variant 4

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

Pump outlet for storage tank relief valve

The switch valve switches off part of the layered tank until an adjustable temperature has been reached in the top of the layered 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.

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.

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 release all pumps

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

Minimum return temperature

Prerequisite: Return temperature control with mixing valve
Minimum temperature of return to 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 mixer vibration, do not set value below 150s!

Output fire off message using HCP0

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

Control boiler loading pump using pump 1

Prerequisite: System 0, system 3 or variant 4

- **NO:** Connection of boiler loading pump at output “HKP0” on core module
- **YES:** Connection of boiler loading pump at output “Pump 1 on core module

Control of boiler loading pump

Prerequisite: System 0, system 3 or variant 4

- Definition of control signal for pump type used.

⇒ See “Activation options of pump outlets” [page 98]

Control of boiler loading pump in operation

Prerequisite: Variant 4

Variant 4 has no speed control of the boiler loading pump. If you need to limit the speed of the boiler loading pump for systemic reasons, you can do so by adjusting this parameter.

Function of boiler pump collective fault sig.

Defines whether and how the input of the boiler pump's collective fault message is to be interpreted.

Input for boiler pump collective fault signal

Preferred digital module address of boiler pump collective fault input

Boiler pump collect. fault sig.

Current input signal.

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

- **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.

⇒ See "External power demand" [page 27]

Invert ext. power demand via analogue input

Designed 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".

Adopt standard settings (all values are reset)

- **YES:** Adopting standard factory settings. This resets all parameters! Once the settings have been applied, the parameter automatically switches to "NO" and the boiler must be reset, otherwise, boiler function is no longer guaranteed.

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).

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



Temperature of secondary boiler

Display of the current boiler temperature of the secondary boiler.

Burner relay status

Shows the current status of the burner relay:

- 0: Secondary boiler not active
- 1: Secondary boiler active

Standby boiler pump

Prerequisite: "Switch valve installed" parameter set to "NO"

Display of the current pump control for the standby boiler.

Standby boiler switch valve

Prerequisite: "Switch valve installed" parameter set to "YES"

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

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

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

NOTICE! Burner blockage noted.

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.

Secondary 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 secondary boiler is started once the set duration has elapsed.

Start standby boiler only after storage tank top

Standby boiler enabled after temperature decreases below minimum temperature on top storage 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 secondary boiler falls below the value that is set under "Minimum temperature of secondary boiler", the isolating valve only switches once the set duration has elapsed.

5.6.3 Boiler 2 - Service

Basic display ➡ Boiler 2 ➡ Service

Control secondary boiler variably to the target value

- **NO:** The secondary boiler is operated with the boiler temperature that is set on the secondary boiler thermostat.
- **YES:** The boiler temperature of the secondary boiler is regulated to the target temperature specified from the heating circuit or DHW tank.

Sensor input of backup boiler sensor

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

Pump output of secondary boiler unloading

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

Control of boiler 2 pump

Definition of control signal for pump type used.

⇒ See "Activation options of pump outlets" [page 98]

Maximum speed of boiler 2 pump

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

Invert secondary 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:** Standby boiler was stopped manually.

5.7 Ignition (only S3/S4 Turbo)

Basic display ➔ Ignition

Automatic ignition

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

Start ignition

Determines how ignition takes place

- **Date and time:** see parameter "Ignition time"
- **Ignite immediately:** Ignition takes place immediately after the insulated door is closed. The ignition starts following the heat-up phase of the Lambda probe.
- **Ext. release:** If the boiler release contact is closed at the core module, ignition starts.
- **Storage tank min:** see parameter "Ignition time"
- **Storage tank <f.flow:** see parameter "Ignition time"

Ignition time (date - time)

Day (date or daily) and time setting for the start of ignition. The parameter is only active when the "Start ignition" parameter is set to "Date and time", "Storage tank min" or "Storage tank <f.flow".

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.
- **"Storage tank min" method:** The ignition process starts if heat is requested from the storage tank from the specified time (parameter "Boiler start if difference between boiler setpoint and top storage 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 storage tank loading criterion applies daily from the specified time.
- **"Storage tank <f.flow" method:** The maximum flow temperature required by the system environment (e.g. heating circuit) is compared with the current storage tank temperature from the specified time. The ignition

Ignition time (date - time)

process starts if the top storage 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. "Heating" status must be reached within this time.

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.

Rising of induced draught fan controller during ignition

Cycle time after which the induced draught fan controller is raised by 1% during "Ignition" status.

Ignition output

Select which contact is used to activate ignition. Selection options: HKP0, standby relay, ignition expansion

Oxygen reduction for fire detection

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

5.8 Fuel

Basic display



Fuel

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.

5.9 Network pump

5.9.1 Network pump - Status



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

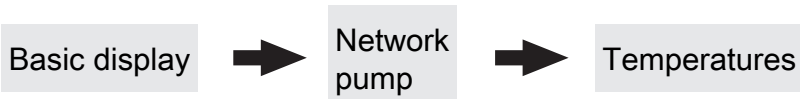
Display of the current return temperature from distributor 2 ... 4.

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.

5.9.2 Network pump - Temperatures



Network return setpoint

Prerequisite: Network pump installed

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

Return temperature setpoint distributor 1

Prerequisite: Variant 1 and pump for distributor 1 installed

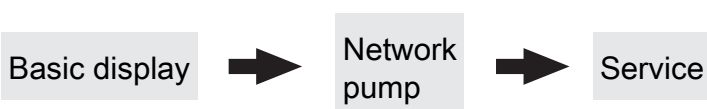
The return temperature from distributor 1 is regulated to the value set here. When the return temperature from distributor 1 reaches the specified value, the pump for distributor 1 starts up at minimum speed.

Return temperature setpoint distributor 2 ... 4

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

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

5.9.3 Network pump - Service



Only switch on the network pump when required by the storage 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.

⇒ See "Activation options of pump outlets" [page 98]

Minimum speed of network pump

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

Maximum speed for network pump

If you need to limit the maximum speed of the network pump for systemic reasons, 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.

⇒ See "Activation options of pump outlets" [page 98]

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 you need to limit the maximum speed of the distributor 1 pump for systemic reasons, 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.

⇒ See "Activation options of pump outlets" [page 98]

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

5.10 Difference regulator

5.10.1 Difference regulator - Status



Heat source temperature

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

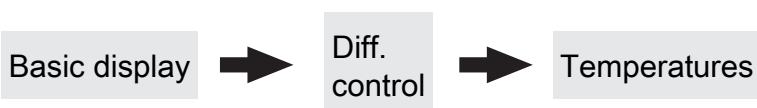
Pump speed

Specifies the current speed of the differential controller pump.

Heat sink sensor

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

5.10.2 Difference regulator - Temperatures



Startup difference

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

Minimum temperature for heat source

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

Shutdown difference

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

Maximum temperature for heat sink

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

5.10.3 Difference regulator - Times



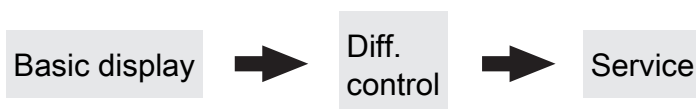
Diff. control start time

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.

5.10.4 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.

⇒ See "[Activation options of pump outlets](#)" [page 98]

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 you need to limit the maximum speed of the pump of the differential controller for systemic reasons, 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

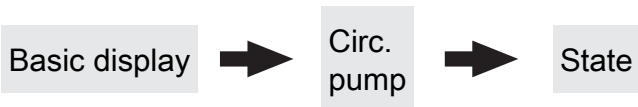
Sensor input to which the heat sink sensor is connected.

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.

5.11 Circulation pump

5.11.1 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.

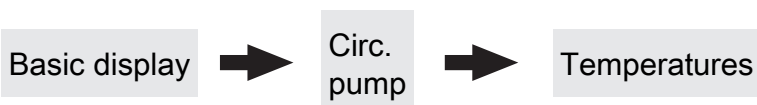
Flow switch on the domestic hot water line

- 0: Flow switch detects no flow rate.
- 1: Flow switch detects flow rate.

Speed of the circulation pump

Specifies the current speed of the circulation pump.

5.11.2 Circulation pump - Temperatures



Return sensor 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!

Switch off the pump at what return temperature in the circulation line

If the set temperature at the return circulation line is reached, the circulation pump will be deactivated.

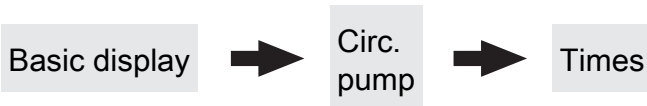
NOTICE! Parameter only relevant when using a return feed sensor in the circulation line!

Circulation pump run-on

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

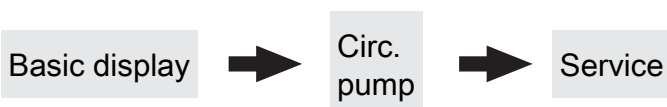
NOTICE! Parameter only relevant when using a flow switch!

5.11.3 Circulation pump - Times



⇒ See "Setting times" [page 50]

5.11.4 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.

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.

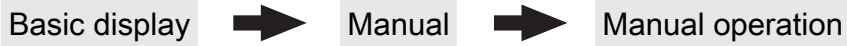
⇒ See "Activation options of pump outlets" [page 98]

Maximum speed of the circulation pump

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

5.12 Manual

5.12.1 Manual - Manual operation



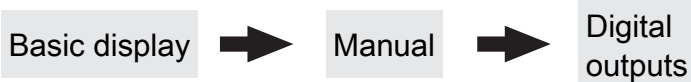
When exiting the “Manual operation” menu, all active parameters are automatically set to “OFF”! The parameters displayed depend on the boiler configuration!

Rinse the condenser manually – only possible if boiler off / on standby

- **ON:** The solenoid opens and the calorific value heat exchanger is cleaned.

NOTICE! This parameter can only be activated when the boiler is in “Standby” or “Boiler off” status.

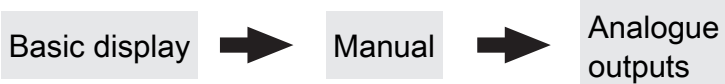
5.12.2 Manual - Digital outputs



The parameters displayed depend on the boiler configuration!

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

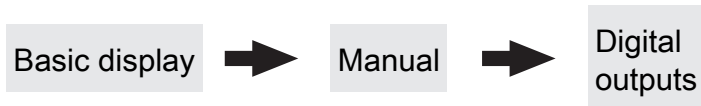
5.12.3 Manual - Analogue outputs



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

5.12.4 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

5.13 System

5.13.1 System - Settings

Setting - Boiler temperature

Basic display → System → Setting → Boiler temperature

⇒ See "Boiler - Temperatures" [page 68]

Setting - Flue gas

Basic display → System → 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. When the flue gas temperature 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.

Maximum 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.

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 the flue gas temperature is below this value for the duration of the "Maximum heating up time, during which HEATING status must be reached", the boiler switches to "Off" 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.

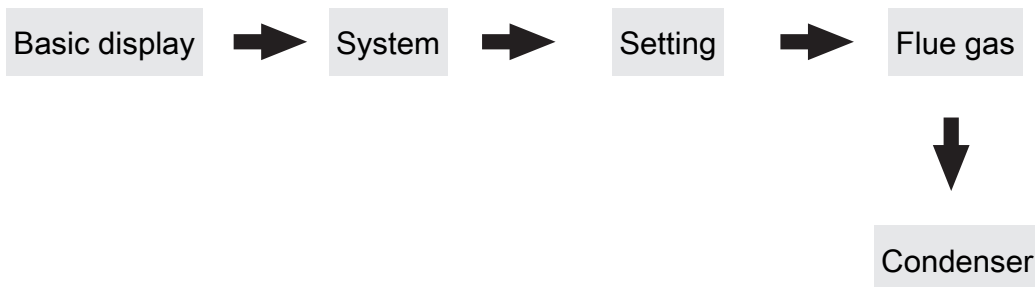
O2 limit for prompt to close the door

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.

Condenser

***On-time of spray valve. Overall cycle 20 sec***

The entire washing process is set with the “Condenser cleaning duration” parameter. The cleaning time is regarded as the time in which the spray valve is active. Pause times (spray valve off) are not included in the cleaning time.

Example:

100% = spray valve active for the specified time

75% = spray valve active for 15 sec and 5 sec pause

Reduce pump release temp. in heat-up phase by

In firewood boilers with a calorific value heat exchanger, the store loading pump is enabled in the heat-up phase at a lower temperature. This ensures an earlier flow through the heat exchanger.

Difference between return setpoint and boiler temp. in heat-up phase

The heat-up phase begins in the “Heating up” status and ends when the boiler temperature has reached the value set under “Boiler temperature from which all pumps are allowed to run”. The return temperature setpoint is regulated in the heat-up phase according to the boiler temperature setpoint. The set value indicates the difference between the return temperature setpoint and the boiler temperature setpoint in the heat-up phase.

Condenser

Heating: 75 min

Washing processes: 3

Overview of condenser.

Setting - Ignition**Automatic ignition**

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

Start ignition

Determines how ignition takes place

- **Date and time:** see parameter "Ignition time"
- **Ignite immediately:** Ignition takes place immediately after the insulated door is closed. The ignition starts following the heat-up phase of the Lambda probe.
- **Ext. release:** If the boiler release contact is closed at the core module, ignition starts.
- **Storage tank min:** see parameter "Ignition time"
- **Storage tank <f.flow:** see parameter "Ignition time"

Ignition time (date - time)

Day (date or daily) and time setting for the start of ignition. The parameter is only active when the "Start ignition" parameter is set to "Date and time", "Storage tank min" or "Storage tank <f.flow".

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.
- **"Storage tank min" method:** The ignition process starts if heat is requested from the storage tank from the specified time (parameter "Boiler start if difference between boiler setpoint and top storage 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 storage tank loading criterion applies daily from the specified time.
- **"Storage tank <f.flow" method:** The maximum flow temperature required by the system environment (e.g. heating circuit) is compared with the current storage tank temperature from the specified time. The ignition process starts if the top storage 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. "Heating" status must be reached within this time.

Ignition output

Specifies which contact is used to activate automatic ignition.

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 primary air

The opening of the primary air flap is not lower than the set value.

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.

Primary air during slumber

In "Slumber" status, the primary 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.

Primary air opening at 0% activation

At 0% activation of the primary air flap, this will open by the specified value.

Primary air opening at 100% control

At 100% activation of the primary air flap, this will open by the specified value at most.

Opening of primary air when boiler is off

The primary air flap is set to this value in the "Boiler off", "Standby" and "Fault" operating statuses.

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.

Start value of ID fan if door open

Start value of the ID fan control in the DOOR OPEN state.

Rising of induced draft fan controller if door is open

Gradient rate at which the ID fan control is increased in the DOOR OPEN state.

Setting - Lambda values

Basic display → System → Setting → Lambda values

Residual oxygen content setpoint

Residual oxygen content which is regulated during "Heating" 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.

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.

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

Automatic lambda probe calibration active

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

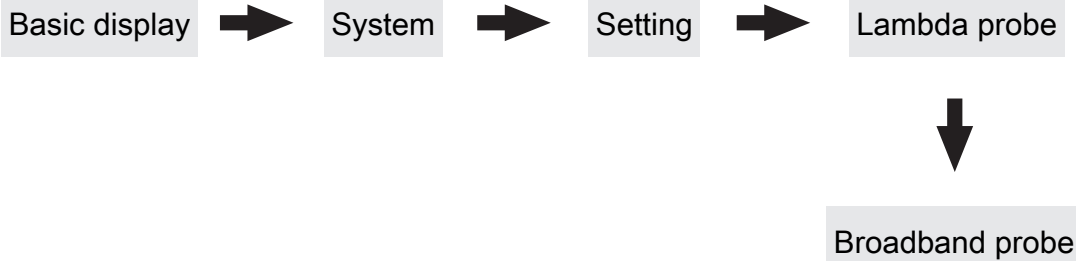
Display of the current measured Lambda probe voltage.

Lambda probes 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" is taken into account.

Broadband probe***Residual oxygen content***

Display of the current residual oxygen content.

Broadband probe heating current

Display of the measured broadband probe heating current.

Broadband probe heating voltage

Display of the measured broadband probe heating voltage.

Broadband probe Nernst voltage

Display of the measured Nernst voltage of the broadband probe.

Broadband probe pump current

Display of the measured broadband probe pump current.

Broadband probe internal resistance

Display of the measured internal resistance of the broadband probe.

Setting - General settings

⇒ See "Boiler - General settings" [page 69]

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 sensor

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

Flow rate at 50% pump rotation speed

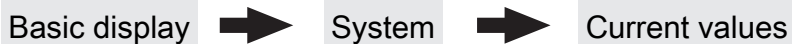
The parameter specifies the volumetric flow rate at 50% pump actuation.

⇒ See "Calculating the feed output of the circulating pump" [page 100]

Flow rate at 100% pump rotation speed

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

⇒ See "Calculating the feed output of the circulating pump" [page 100]

5.13.2 System - Current values

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

5.13.3 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.

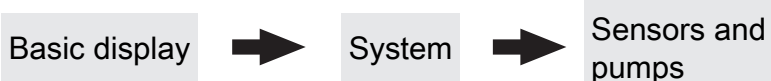
Error - Error history

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.

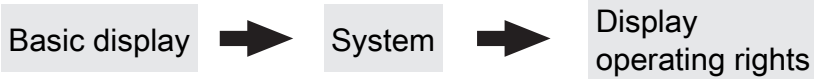
Error - Clear error history

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.

5.13.4 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.

5.13.5 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.

Storage tank system:

Allow access to storage tank 01 ... 04?

Specifies whether storage tank 01 ... 04 can be accessed from touchscreen 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.

5.13.6 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:

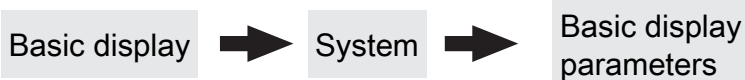
Touchscreen with address 1 ... 7 is assigned to the following DHW tank:

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:

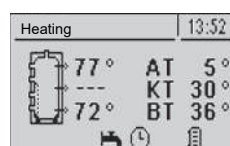
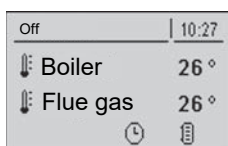
To assign a DHW tank to a specific room console, the respective DHW tank number with its address must be set on the room console. The parameters are set to “none” at the factory!

5.13.7 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 |



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)

5.13.8 System - Boiler mode

Basic display ➡ 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.

Boiler mode

- **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.

5.13.9 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

5.13.10 System - Current Date

Basic display ➡ System ➡ Current Date

Current Date

Display and setting of current date.

5.13.11 System - Current Time

Basic display ➡ System ➡ Current Time

Current Time

Display and setting the current time.

5.13.12 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.

Installer / Service

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

Customer (Code "1")

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

5.13.13 System - System selection

Basic display ➡ System ➡ System selection

⇒ See "Setting the system type" [page 40]

6 Troubleshooting

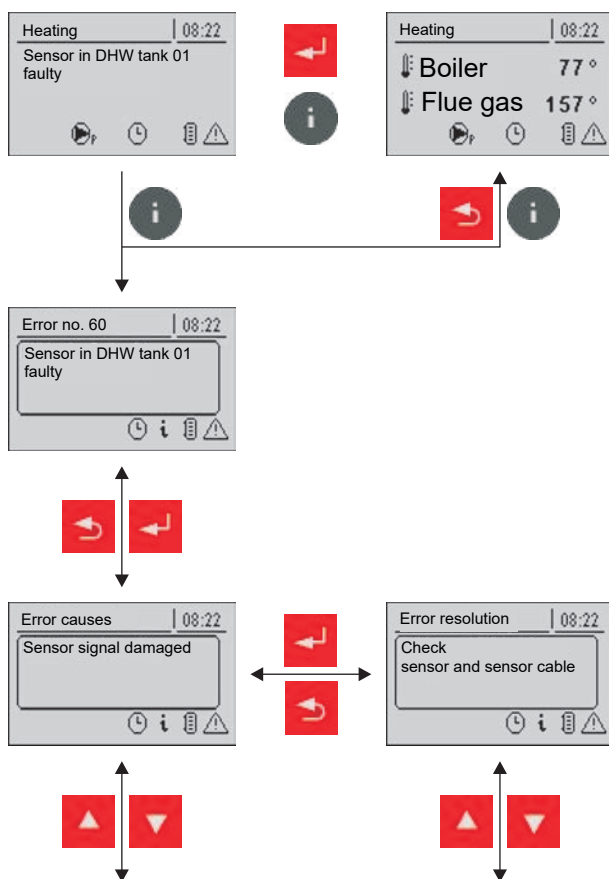
The term "fault" is a collective term for warnings, errors and alarms. The boiler reacts differently to the three types of message:

| | |
|----------------|---|
| 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:

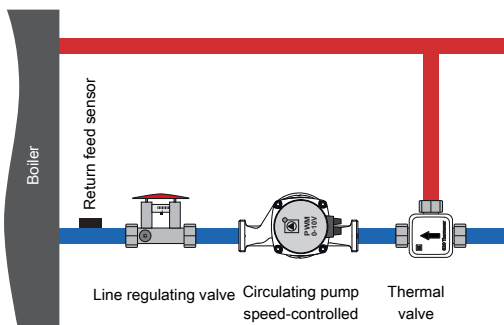
- DHW loading pump
- Buffer pump
- Collector pump (not applicable to system 12 and system 13)
- Difference control pump
- Heating circuits (15 seconds pump run, subsequently the mixer starts up and shuts down again)

7.3 Determination of the quantity of heat

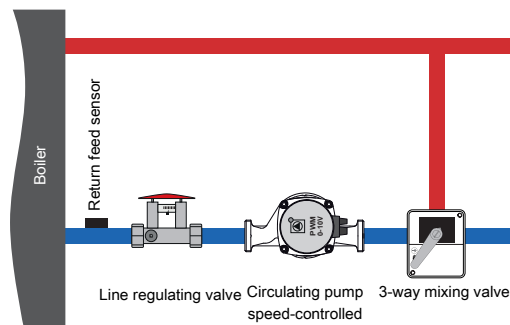
7.3.1 Assembly Information

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

Return temperature control with thermal valve (FE pump assembly)



Return temperature control with mixing valve (ME pump assembly)



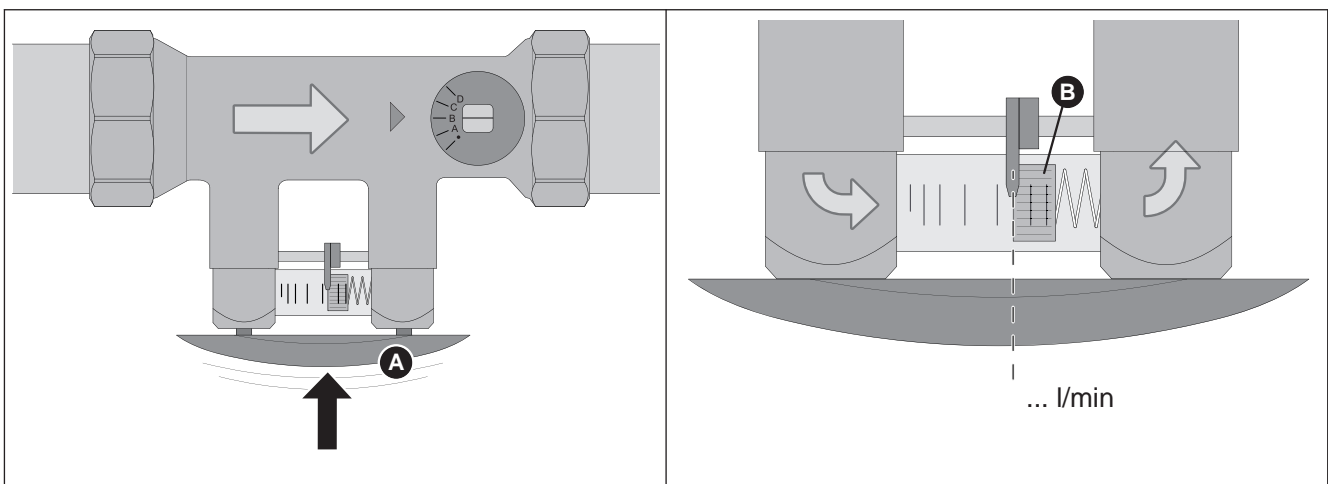
7.3.2 Functioning and configuration

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.

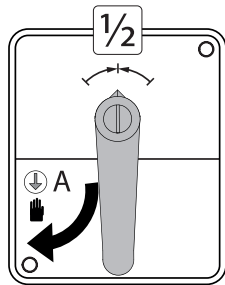
Calculating the feed output of the circulating pump

Boiler with thermal valve

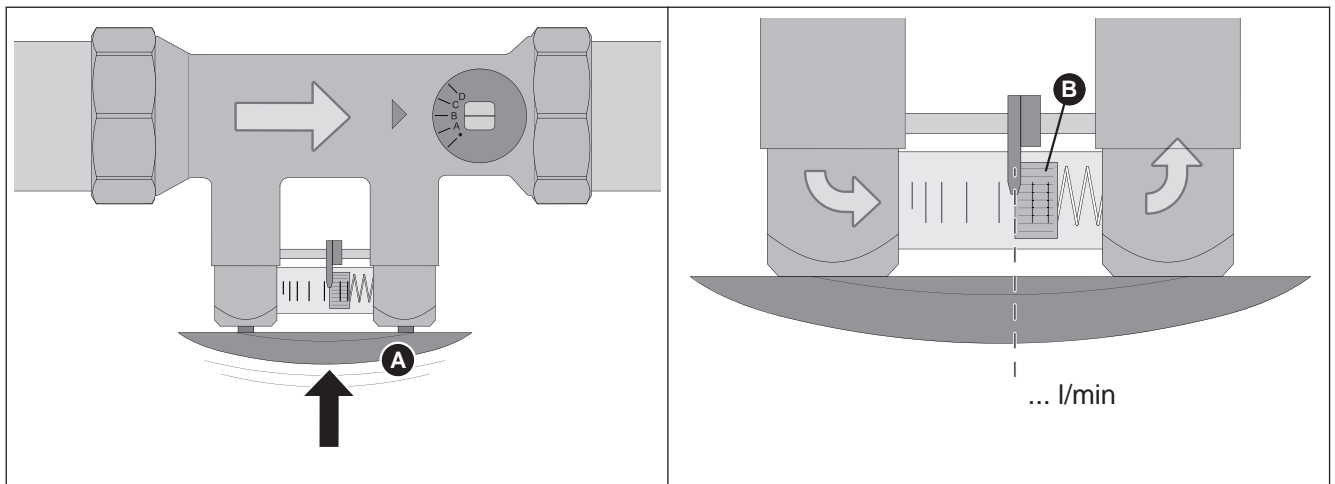
- ☐ Bring the boiler to the boiler temperature setpoint



- ☐ 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 floater (B)
- ☐ Activate the circulating pump in manual operation at 50% speed
- ☐ Press the push bar on the line regulating valve; make a note of the flow on the scale

Setting the type of heat quantity calculation

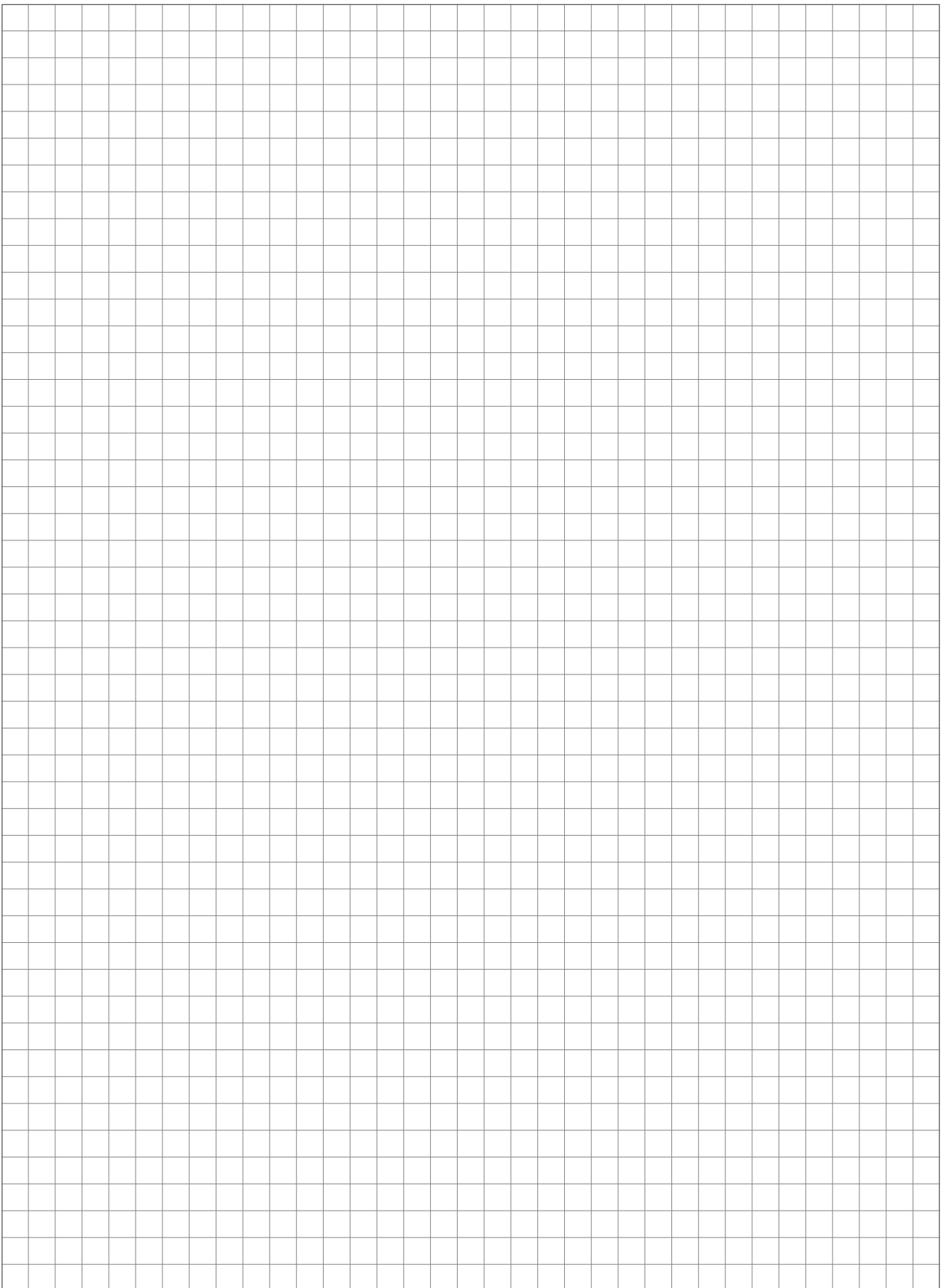
- ☐ Set the relevant parameters accordingly for boilers with button display in the Boiler type menu (System → System → System selection → Boiler type → Flow rate sensing for calculating the heat quantity)

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

8 Notes

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.



9 Appendix

9.1 Addresses

9.1.1 Address of manufacturer

FRÖLING
Heizkessel- und Behälterbau GesmbH

Industriestraße 12
A-4710 Grieskirchen
AUSTRIA

TEL 0043 (0)7248 606 0
FAX 0043 (0)7248 606 600
EMAIL info@froeling.com
INTERNET www.froeling.com

Customer service

| | |
|-----------|------------------------|
| Austria | 0043 (0)7248 606 7000 |
| Germany | 0049 (0)89 927 926 400 |
| Worldwide | 0043 (0)7248 606 0 |

9.1.2 Address of the installer

Stamp