

Operating Instructions



(Turbomatic 28 - 55 kW)



(Turbomatic 70 - 110 kW)

Turbomatic TMC 28-110

with Lambdatronic H 3100 (from Version 13.18)



*Read and follow the operating instructions and safety information.
Subject to technical change.*

Dear customer,

Congratulations for choosing a quality product from FRÖLING.

The FRÖLING Turbomatic waste wood boiler features a state-of-the-art design that conforms to all currently applicable standards and testing guidelines.

Please read and observe the operating instructions and always keep them close to the boiler for reference. They contain safety information and all the operation and maintenance specifications needed to operate the boiler safely, properly and economically.

Due to the continuous further development of our products, the illustrations and contents may vary slightly. If you observe any errors, please inform us.
Subject to technical change.

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1 Product Overview



Pos.	Component	Symb.
1	Waste wood boiler - Fröling Turbomatic	
2	Switch cabinet with integrated Lambdatronic H 3100 controls	
3	Main switch: turn the power supply for the whole system on and off	
4	Control panel of the Lambdatronic H 3100 controls	
4.1	Status LED (operating status): - Long green flashing: Boiler activated - Short green flashing: Boiler deactivated - Red flashing: Fault	
4.2	Two-row display showing operating mode, operating status, parameters, ...	
4.3	Start key: Switch on boiler	
4.4	Stop key: Switch off boiler	
4.5	Temperature selector: selects temperature setpoint (setting range: 70 - 90°C)	
4.6	Back key: Return from a submenu or undo an entry	
4.7	Up arrow key: Move the arrow up in the menu, increase or activate parameters	
4.8	Down arrow key: Move the arrow down in the menu, decrease or deactivate parameters	
4.9	Enter key: Go to submenus, call up or confirm entries	
5	Fuel transport unit with top gravity shaft, burn-back flap or rotary valve as protection against back-burn and stoker screw for fuel transport	
6	Automatic igniter	
7	Automatic tipping grate with shaker	
8	Ashbox for automatic ash removal or second ashbox for automatic heat exchanger ash removal (supplied as optional with TMC 28-55, as standard with TMC 70-110)	
9	Combustion air blower: pressure side blower for supplying primary and secondary air	
10	Combustion chamber overpressure sensor: to detect overpressure in the combustion chamber	
11	Heat exchanger system with turbulators and automatic drive for heat exchanger cleaning	
12	Combustion chamber door with viewing window	
13	Cleaning door beneath the heat exchanger (only for TMC 28-55; see position 8)	
14	Secondary air control with actuator drive	
15	Primary air control with actuator drive	

2 Safety

2.1 Safety Information



DANGER

Non-permitted use!

Incorrect use of the boiler can cause severe injuries and damage!

The instructions and information provided in the instructions should be observed!

Details on procedure for operation, maintenance and cleaning, as well as troubleshooting for the boiler are included in the individual instructions. Any further work should be carried out by authorised heating engineers or by Fröling customer services.



WARNING

External influences!

Negative external influences, such as insufficient combustion air or non-permitted fuel can cause serious faults in combustion (e.g. spontaneous combustion of carbonisation gases or flash fires) which can in turn cause serious accidents!

Instructions and information for versions and minimum values, as well as norms and guidelines for heating components in the instructions must be observed!



WARNING

Severe injuries and damage can be caused by an inadequate flue gas system!

Problems with the flue system, such as poor cleaning of the flue pipe or insufficient chimney draught can cause serious faults in combustion (such as spontaneous combustion of carbonisation gases or flash fires)!

You can only be guaranteed of optimum performance from the boiler if the flue gas system is running smoothly!

2.2 Permitted Use

The boiler should only be operated when it is in full working order. It should be operated in accordance with the instructions, observing safety precautions, and you should ensure you are aware of the potential hazards.

Ensure that any faults, which might impact safety are traced and removed immediately.

The waste wood boiler of the Turbomatic series is intended exclusively for heating domestic water. Only use the fuels specified 2.2.1 below

The manufacturer or supplier is not liable for any damages resulting from non-permitted use.

2.2.1 Permitted fuels

Waste wood



	Description as per		Description as per ÖNORM M 7133
	ÖNORM M 7133	ÖNORM/DIN CEN/TS 14961	
Water content	W20	M20	air dried
	W30	M30	suitable for storage
Size	G30	P16	Fine waste wood
	G50	P45	Medium waste wood (only for TMC 70 - 110)

Applicable standards:

Austria: ÖNORM M 7133 or ÖNORM CEN/TS 14961

Germany: Waste wood as per §3 (1) para.4 of the 1.BImSchV i.d.g.F.
(First Federal Emissions Protection Ordinance)

Specifications in accordance with DIN CEN/TS 14961 and/or
ÖNORM M 7133



Pellets

Wood pellets from natural wood with a diameter of 6 - 10 mm

Exception:

When using a pellet suction system the maximum diameter of the wood pellets is limited to 6 mm!

Applicable standards:

Austria:	ÖNORM M 7135 - HP 1 and/or DINplus certification program
Germany:	DIN 51731 - HP 5, DINplus certification program and/or ÖNORM M 7135 - HP 1

**Generally applicable:**

Before refilling the store, check for pellet dust and clean if necessary.

Shavings

Shavings are generally problematic for burning. For this reason, the use of shavings is only permitted after authorisation from Fröling. Beyond this the following additional instructions apply:

- ☞ Shavings and joinery waste should only be used in systems with rotary valves.
- ☞ The store must be fitted with a pressure release system in accordance with local regulations!

Miscanthus

Switchgrass or elephant grass (Miscanthus in Latin) are known as C4 plants.

Standards and regulations for burning this type of grass have not been harmonised, so the following are applicable:

- ☞ **When burning miscanthus, local regulations must be observed. If necessary, operation is only possible with individual permission.**

Changing fuel



IMPORTANT

Incorrect fuel parameter settings!

Incorrect fuel parameter settings lead to serious problems with boiler functions and also void the guarantee!

If the fuel is changed (e.g. from waste wood to pellets), the system must be reset by Fröling factory customer services!

2.2.2 Non-permitted fuels



IMPORTANT

Non-permitted fuels!

Burning non-permitted fuels leads to a build-up of aggressive sedimentation and condensation, which can lead to damage to the boiler and also voids the warranty!

All fuels, which are not defined under 2.1.1 are not permitted. Due to various air-quality protection regulations, non-permitted fuels include:

- Cardboard waste, treated wood wastes, pure grinding dust,...
- Refuse, large quantities of paper, cardboard containers, ...
- Coal (brown coal, anthracite coal, briquettes)

2.2.3 Who may operate the boiler?

Only trained operators are permitted to operate the boiler.



IMPORTANT

No unauthorised access to the boiler room!

Personal injury and damage to property!

It is the responsibility of the operator to ensure that unauthorised persons, especially children, are kept away from the boiler

2.3 Design Information

It is generally forbidden to carry modifications to the boiler or to change or deactivate safety equipment.

In addition to the operating instructions and the applicable regulations for the country in which the boiler will be operated for installation and operation of the boiler system, all fire, police, and electrical regulations must be observed.

2.3.1 Approval and reporting obligations

NOTE

Each heating system must be officially approved.

When installing or modifying a heating system, you must inform the inspectors from the supervisory authority and get authorisation from the building authorities.

Austria: When installing or modifying a heating system, you must inform the inspectors from the supervisory authority and get authorisation from the building authorities.

Germany: Report new installations to an approved chimney sweeper and to the building authorities.

Other countries: Observe local regulations for approval

2.3.2 Requirements for hot water supplies

The requirements for heating water are based on the following standards:

Applicable standards:

Austria: ÖNORM H 5195-1
Germany: VDI 2035



If the system is topped up or refilled:
Prepare (soften) the water to prevent boiler scaling.

2.3.3 Ventilation of boiler room

The openings for the supply air and the exhaust air should be arranged as nearly opposite each other as possible to achieve a good thermal draught effect.

☞ The supply air must be drawn in directly from outside. The exhaust air must be discharged directly outside.

Provided they are not contradicted by the relevant building regulations room where the boiler is to be installed, the following standards apply:

Applicable standards:

- TRVB H 118
- NORM H 5170



Provide a supply air cross-section of 2 cm² per kW of boiler rated output, as per ÖNORM H 5170, but a total cross-section of at least 200 cm²

2.3.4 Installing the heating system / Standards

The following standards govern the installation of heating systems:

Applicable standards:

ÖNORM / DIN EN 12828 Heating Systems in Buildings

The following prior standards still apply:

- | | |
|----------|---|
| Austria: | - closed systems as per ÖNORM B 8131 |
| | - open systems as per ÖNORM B 8130 |
| Germany: | - closed systems as per DIN 4751 Part 2 |
| | - open systems as per DIN 4751 Part 1 |



Storage tank

NOTE

A storage tank with the proper dimensions will guarantee the best boiler operating values during the entire heating period.
For the correct dimensioning of the storage tank, contact your installer or Fröling.

Return feed lift

If the hot water return feed is under the minimum return feed temperature, some of the hot water outfeed will be mixed in.

**IMPORTANT**

Below dew point / condensation forms during operation without return feed lift!

Condensation water and fuel residue combine to form an aggressive condensate, leading to damage to the boiler!

Regulations demand the use of a return feed lift!

2.3.5 Chimney connection / chimney system

EN 303-5 specifies that the entire flue gas system must be designed to prevent, wherever possible, damage caused by seepage, insufficient feed pressure and condensation.

It should be noted here that flue gas temperatures of less than 160 K above room temperature can occur within the permitted operating range of the boiler.

The flue gas temperatures (when cleaned) and the additional flue gas values can be found in the technical specification sheets.

➔ [Page 17, Boiler data for constructing the flue gas system](#)

The connection between the boiler and the chimney system should be as short as possible. The upward angle of the connection should not exceed 30 - 45°. Insulate the connection.

The entire flue gas system (chimney and connection) must be worked out as per ÖNORM / DIN EN 13384-1 or prior standards ÖNORM M 7515 / DIN 4705-1.

Local and other legal regulations also apply!

- ☞ The chimney must be approved by a smoke trap sweeper or chimney sweeper.
- ☞ As per TRVB H 118 (only in Austria) an explosion flap must be installed in the flue pipe or in the chimney.
(outside Austria installing an explosion flap is recommended.)

Draught limiter

- ☞ We recommend that you install a draught limiter (1)
- ☞ Install the draught limiter directly under the mouth of the flue line, as there is always low pressure there.



Boiler data for constructing the flue gas system

Component		Units	28	35	48	55	70	85	100	110
Flue gas temperature	RL	°C	165	180	170	185	170	170	190	190
	PL		120	120	120	120	120	120	120	120
Flue gas mass flow	RL	kg/s	0.025	0.031	0.040	0.050	0.052	0.063	0.077	0.082
	PL		0.009	0.011	0.015	0.017	0.021	0.026	0.031	0.034
Required feed pressure	RL	mbar	0.12	0.12	0.15	0.15	0.10	0.10	0.15	0.15
	PL		0.06	0.06	0.08	0.08	0.06	0.06	0.08	0.08
Flue pipe diameter		mm	150	150	150	150	200	200	200	200

RL = Rated Load, PL = Partial Load

2.4 Safety Devices



1	STOP key 	In case of overheating, shut down the boiler - The pumps continue to run. Always end heating with the STOP key. Never use the main switch.
2	Safety temperature limiter (back of boiler)	Page 19, Devices for preventing the boiler from overheating
3	Main switch 	For shutting down the entire system - The power to all components is switched off. - Only turn off the main switch when the system has cooled down and the controls are switched off ("Boiler Off" status).
4	Fuse (in the switch cabinet)	Fuse the controls and electrical components When changing the fuse ensure that: - The fuse should only be changed by an electrician with the power supply switched off - Fit fuses with the specified rated current.
5	Water Sprinkler System 	In case of a back-burn the sprinkler system valve opens and water enters the gravity shaft and in the feed screw canal. Connecting this is only obligatory if required by the authorities.

2.4.1 Devices for preventing the boiler from overheating

Thermal discharge safety device



At around 100 °C a valve opens and sends cold water to the safety heat-exchanger to decrease the temperature.

Safety Temperature Limiter STL



Stops combustion at a max. boiler temperature of 100 °C. The pumps continue to run.

☞ As soon as the temperature has gone back down, the STL (1) must be mechanically unlocked.

Safety valve



Protection against over-heating/ excessive pressure:

When the boiler pressure reaches a maximum of 3 bar, the safety valve opens and the heating water is released in the form of steam.

2.5 Safety information for installation room

- Danger of fire due to flammable materials!
No flammable materials should be stored near the boiler.
- Damage due to impurities in combustion air!
Do not use any solvents or any cleaning agents containing chlorine in the room where the boiler is installed.
- Keep the air suction opening of the boiler free of dust.
- The room where the boiler is installed must be frost-proof.

2.6 Other risks


 WARNING

Do not touch the hot surface!

Hot parts and the flue pipe can cause serious burns!

- ☐ Protective gloves should generally be worn when working on the boiler.
- ☐ Only operate the boiler using the handles provided for this purpose.
- ☐ Insulate the flue pipes or simply avoid touching them during operation.



Before carrying out work in the boiler:

- ☐ Turn off the boiler with the  key and allow it to cool down
 - ☐ Then switch off the main switch.
-  **Never turn off the boiler directly with the main switch!**


 WARNING

Do not open the combustion chamber door during operation!

This may cause injury, damage and smoke!

It is forbidden to open the doors behind the insulating door during operation!


 WARNING

Do not use unauthorised fuel!

Non-standard fuels can cause serious faults in combustion (e.g. spontaneous combustion of carbonisation gases / flash fires) which can lead to serious accidents!

Only use fuels specified in the chapter on "Permitted Uses" in these instructions.



2.7 Emergency procedure

2.7.1 System overheating

If the system overheats in spite of the safety devices, proceed as follows:

- ☐ Keep all the doors on the boiler closed.
- ☐ Turn off the boiler with the  key
 -  Under no circumstances use the main switch!
- ☐ Open all mixer taps, switch on all pumps.
 -  Fröling heating circuit controls take over this function in automatic operation.
 -  When using controls made by another manufacturer, take the appropriate measures to activate mixer tanks and pumps manually.
- ☐ Leave the boiler room and close the door
- ☐ Open any available radiator thermostat valves

If the temperature does not drop, inform the installer or Fröling customer services:

 [Page 90, 8.2 Address of manufacturer](#)

2.7.2 Smell of flue gas



DANGER

Smell of flue gas!

Flue gases can cause fatal poisoning!

- ☐ Keep all the doors on the boiler closed.
- ☐ Turn off the boiler with the  key
 -  **Under no circumstances use the main switch!**
- ☐ Air the room where the boiler is installed
- ☐ Close the door of the boiler room and doors to living areas



2.7.3 Fire



DANGER

Fire!

In case of fire, there is risk of burns and explosions!

- ☐ Turn off the boiler
- ☐ Use a tested fire extinguisher for fire class AB to fight the fire



AB powder

3 Operating the system

3.1 Initial startup

NOTE

Initial startup should be carried out with an authorised installer or with Fröling customer services.

The individual steps of the initial setup procedure are explained in the chapter on “Installers and service technicians”

➤ [Page 71, 7.4 Initial startup](#)

NOTE

If condensation escapes during the initial heatup phase, this does not indicate a fault.

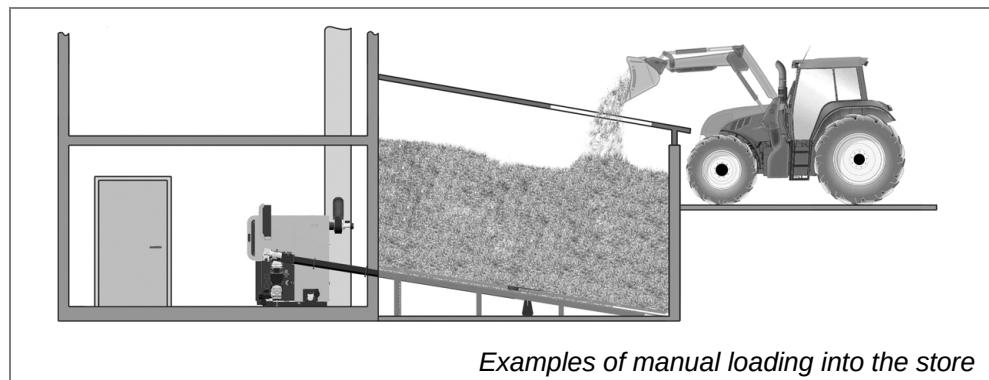
☞ If this occurs, clean up using a cleaning rag.

3.2 Filling / refilling the store with fuel

Generally, when filling the store, you must ensure that you use the right fuel:

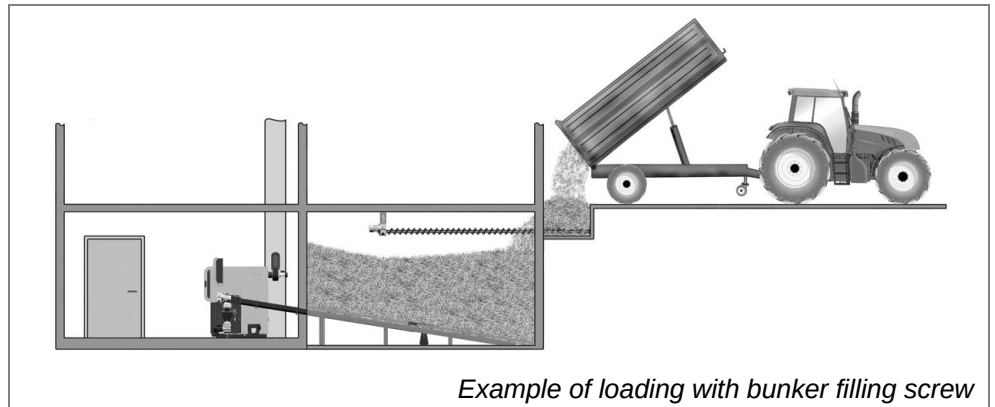
➤ [Page 11, 2.2.1 Permitted fuels](#)

3.2.1 Manual loading into the store



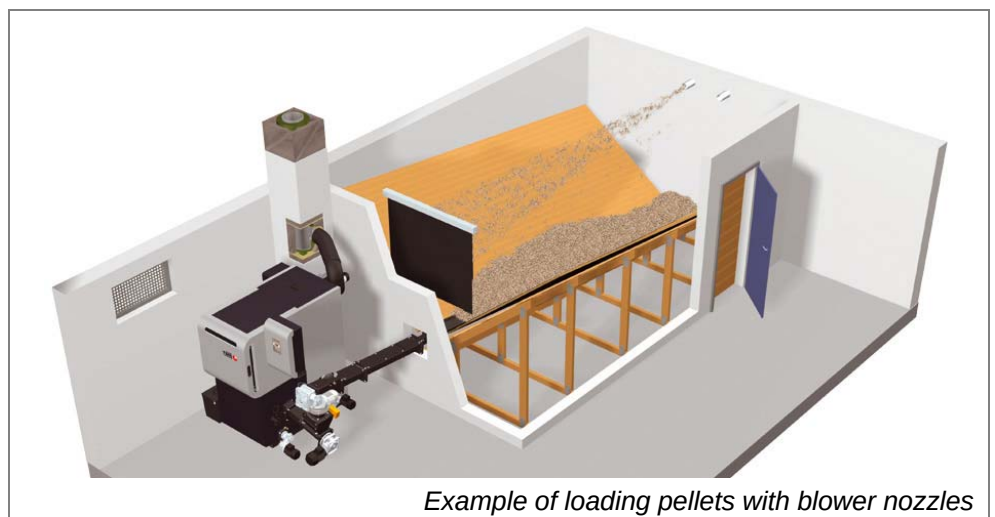
- ☐ Filling / refilling the store with fuel
 - ☞ **IMPORTANT** The feeder unit must be on during the filling process!
 - ☞ Only activate the parameter “Man. fuelling in com. chamb.” until the first pieces of fuel enter the gravity shaft.
 - [Observe the additional instructions and notes in the instructions of the feeder unit.](#)

3.2.2 Loading with bunker filling screw



- ☐ Turn on the bunker filling screw
- ☐ Load the fuel through the feed opening
 - ✎ **IMPORTANT** The feeder system must be on during the filling process!
 - ✎ Only activate the parameter "Man. fuelling in com. chamb." until the first pieces of fuel enter the gravity shaft.
 - **Observe the additional instructions and notes in the instructions of the feeder unit.**

3.2.3 Loading with blower nozzles



IMPORTANT

Damage and injuries can occur if the store is filled when the boiler is on!

- ☐ Turn off the boiler with the  key
- ☐ Allow the boiler to cool for **at least an hour**

When the boiler has cooled down:

- ☐ Close all opening to the store to seal out dust
- ☐ Blow the fuel into the store

With bottom stirring apparatus/ spring blade stirring apparatus also observe the following:

- ☞ **IMPORTANT** The feeder system must be on during the filling process!
- ☞ Only activate the parameter "Man. fuelling in com. chamb." until the first pieces of fuel enter the gravity shaft.

3.2.4 Loading using the Turbomatic with pellet suction system



Example of a Turbomatic with pellet suction system



IMPORTANT

Damage and injuries can occur if the store is filled when the boiler is on!

- ☐ Turn off the boiler with the  key
- ☐ Allow the boiler to cool for **at least an hour**

When the boiler has cooled down:

- ☐ Close all opening to the store to seal out dust
- ☐ Blow the fuel into the store

3.3 Heating up the boiler

3.3.1 Switching on the system

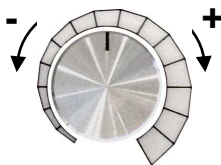


- ☐ Turn the mains switch on the side of the switch cabinet to the “ON” position
 - ➡ After the system check by the controls, the system is ready for operation
 - ➡ The display shows “Switched off”

3.3.2 Turn on the boiler

- ☐  Press this key
 - ➡ The heating system is regulated by the controls in accordance with the mode which has been set.

3.3.3 Setting the boiler temperature



To raise the boiler temperature:

- ☐ Turn the temperature selector right
 - ➡ The boiler temperature is increased
The top limit is 90°C

To reduce the boiler temperature:

- ☐ Turn the temperature selector left
 - ➡ The boiler temperature is lowered
The top limit is 70°C

3.3.4 Controlling the boiler

➡ [See chapter 4 - Lambdatronic H 3100 Controls](#)

3.3.5 To turn off the boiler

- ☐  Press this key
 - ➡ The boiler follows the shut-down program and switches to “Boiler OFF” status.
 - ➡ The control system then only controls the connected heating components

3.3.6 To turn off the system

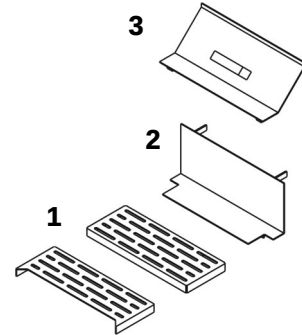


- ⚠ **IMPORTANT Only turn off the system when the boiler is cold and at the status “Boiler off”**
- ☐ Switch off the main switch on the controls
 - ➡ The controls are switched off
 - ➡ The components supplied by the switch cabinet are powered down
 - ⚠ The extension switch cabinet with its own power line is still live!

3.4 Emergency firewood operation

The Turbomatic TMC series boiler offers the option of manual firewood operation. This requires the optional “Expansion pack for emergency firewood operation” consisting of:

- 1 x grate insert (1)
- 1 x burn-out plate (2)
- 1 x cover plate (3)



IMPORTANT

Incorrect emergency firewood operation

Damage may occur to the boiler!

For emergency firewood operation, the following points must be followed:

- ☐ Only use under exceptional circumstances
 - ➔ We accept no responsibility for prolonged use in emergency operation
- ☐ Connect a thermal discharge safety device to the safety battery
- ☐ Base feed on output
- ☐ Use a correctly dimensioned storage tank

3.4.1 Modify the boiler for emergency firewood operation



WARNING

Do not carry out modifications when the boiler is hot!

Hot parts and the flue pipe can cause serious burns!

- ☐ Protective gloves should generally be worn when working on the boiler.
- ☐ Only operate the boiler using the handles provided for this purpose.
- ☐ Insulate the flue pipes or simply avoid touching them during operation.



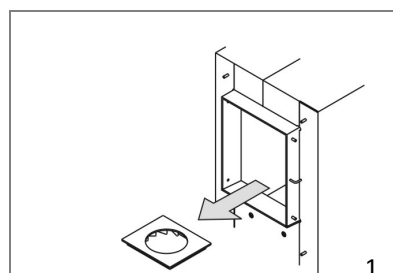
Before carrying out work in the boiler:

- ☐ Turn off the boiler with the  key and allow it to cool down
- ☐ Then switch off the main switch.

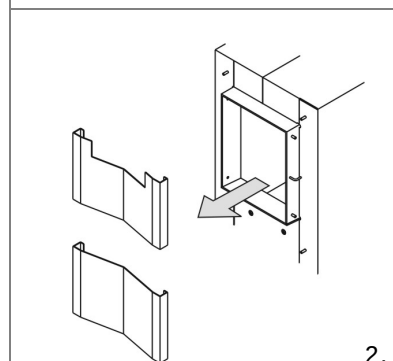
⚠ **Never turn off the boiler directly with the main switch!**

When the boiler has cooled down:

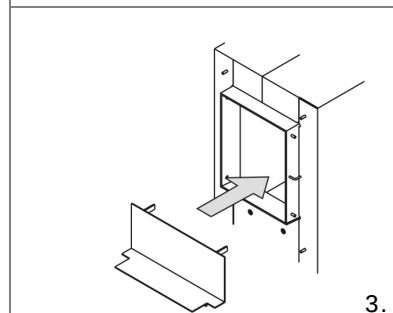
- ☐ Remove the burn-out opening from the combustion chamber



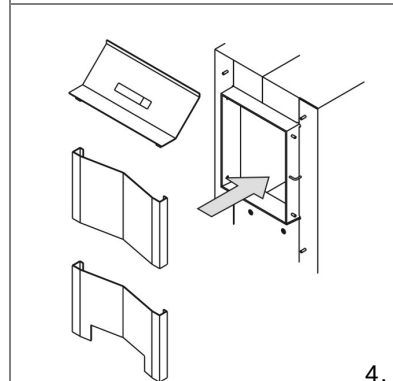
- ☐ Push the guide plates in the U-profiles up and remove them
- ☐ Check the guide plates for dirt and clean if necessary



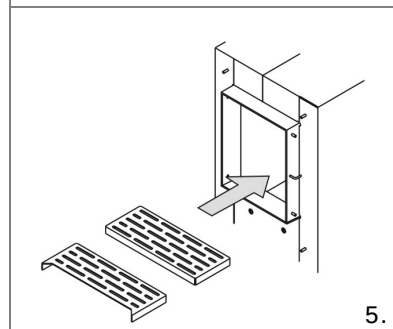
- ☐ Mount the burn-out plate with mounts (1) behind the U-profiles



- ☐ Mount the guide plates on the U-profiles in the combustion chamber and push down
- ☐ Ensure that the combustion slit (2) is at the bottom.



- ☐ Insert the grate insert in the combustion chamber as shown



3.4.2 Set the controls to emergency firewood operation

For emergency firewood operation, the mode must be set to "Firewood operation" on the controls:

- | | |
|---|---|
| ☐  Press this key 2x
➔ The arrow on the display points to the first parameter in the "Settings" menu (e.g. boiler temp.) | <div style="border: 1px solid black; padding: 5px; width: fit-content;"> Boiler temp. ←
 Boiler setting </div> |
| ☐  Press this key until the arrow points to the mode
👉 For example: winter operation | <div style="border: 1px solid black; padding: 5px; width: fit-content;"> Mode
 Winter operation ← </div> |
| ☐  Press this key
➔ A question mark appears
➔ The value can be changed | <div style="border: 1px solid black; padding: 5px; width: fit-content;"> Mode
 Winter operation ? </div> |
| ☐  Press this key until firewood operation is shown on the display | |
| ☐  Press this key
➔ An arrow appears
➔ Firewood operation has been set | <div style="border: 1px solid black; padding: 5px; width: fit-content;"> Mode
 Firewood operation ← </div> |
| ☐  Press this key 3x
➔ The operating status is displayed | <div style="border: 1px solid black; padding: 5px; width: fit-content;"> Switched Off
 Off ← </div> |
| ☐  Press this key
➔ Firewood operation is activated | <div style="border: 1px solid black; padding: 5px; width: fit-content;"> Firewood operation
 Off ← </div> |

3.4.3 Filling the boiler with firewood

- ☐ Open the insulating door and combustion chamber door
 - ➡ Combustion air blower fan and induced draught fan switch on
- ☐ Place a layer of firewood on the emergency grate
- ☐ Place crumpled paper and cardboard on top of it
- ☐ Fill the remaining space with firewood
- ☐ Ignite paper

- ☐  Press this key and close the doors
 - ➡ Both fans continue to run
 - ➡ "Off" appears on the display

Firewood operation
Off ←

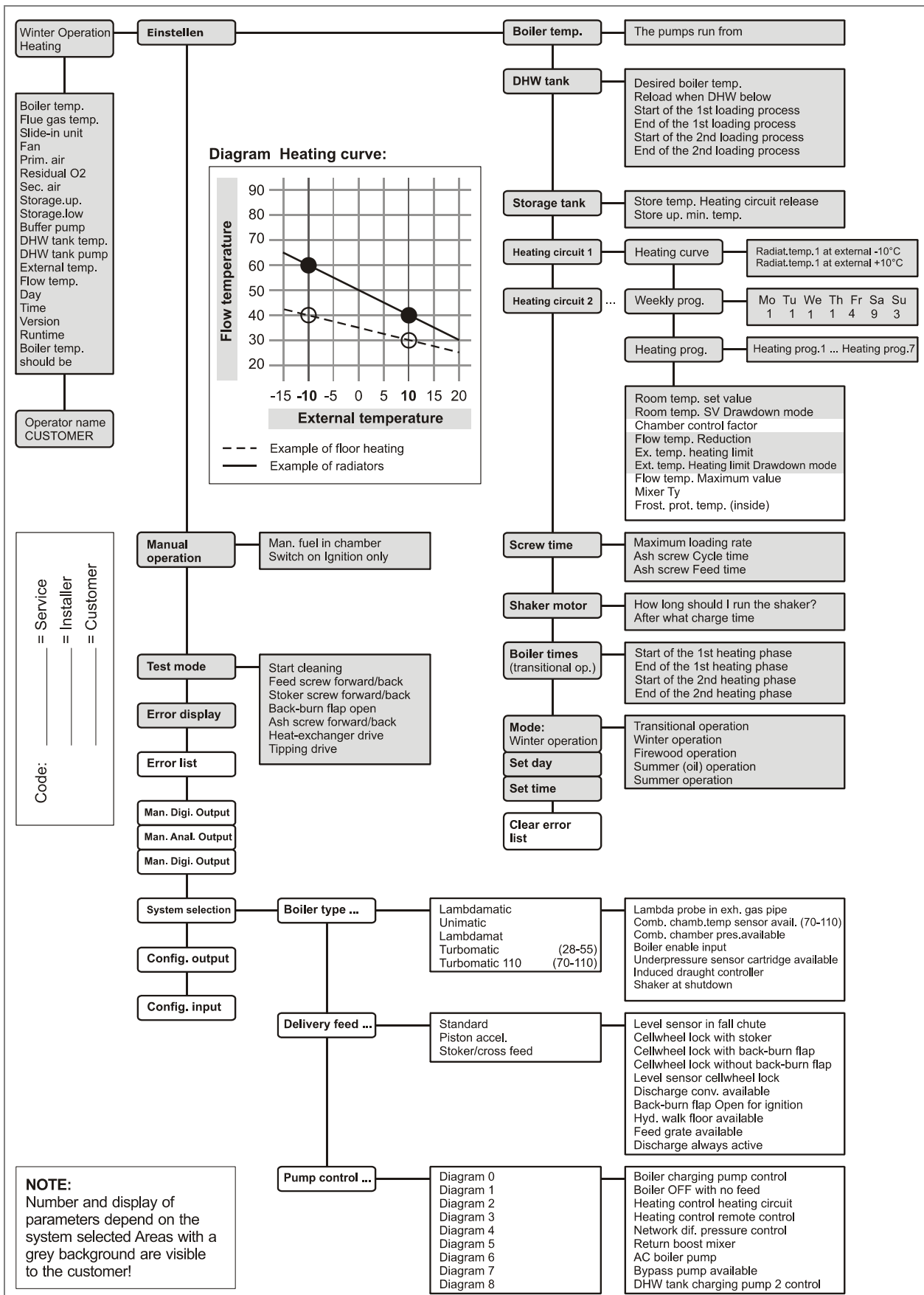
3.5 Modifying the boiler for normal operation

Naturally, the procedure to modify the boiler for normal operation is carried out in the opposite order to the modifications for emergency operation

NOTE

Before starting up the automatic burner, check and clean the boiler. The main points to check are the chamber, the induced draught fan and the heat exchanger equipment!

4 Lambdatronic H 3100 Controls



4.1 Heating times table

	Heating phase 1		Heating phase 2	
	Start	End	Start	End
Heating prog.1				
Heating prog.2				
Heating prog.3				
Heating prog.4				

	Heating phase 1		Heating phase 2	
	Start	End	Start	End
Heating prog.5				
Heating prog.6				
Heating prog.7				

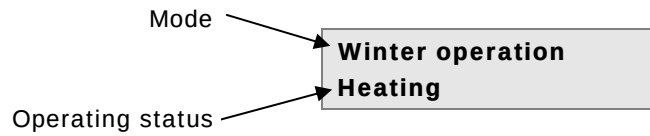
You can make a note of your weekly program settings for the individual heating circuits here:
For each day of the week, one of the 7 heating programs can be selected for each heating circuit.

Weekly program	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Heating circuit 1							
Heating circuit 2							

Notes:

4.2 Display values

After the main switch has been switched on and the control system has carried out the system check, the display shows the standard readout with the mode and operating status.



➤ See 4.2.1 Modes or 4.2.2 Operating statuses

You can scroll through the display values using the arrow keys:

The parameters, which are actually displayed, depend on the boiler configuration, operating level and boiler status.

Winter operation	
Heating	
Boiler temp.	80°
Flue gas temp.	176°
Loading unit	75%
Fan	82%
Primary Air	57%
Residual O2	7,9%
Comb. ch. temp.	685°
Secondary air	100%
C.C. vacuum	15P
Top storage t.	60°
Bot. storage t.	55°
Buffer pump	40%
Boiler pump	100%
Boiler temp. (DHW temp.)	55°
Boiler pump (DHW pump)	42%
Bypass temp.	55°
Bypass pump	100%
Oilboil.tmp.	40°
Oilboil.pump	0%
External temp.	-5°
Radiat.temp SV1	50°
Radiat.temp. 1	50°
Remote cont. 1	20°
Party switch 1	0
Day:	Mo 20.11.06
Time:	17:56:43
Version:	13.17
Runtime:	2h
Type:	Turbomatic
Boiler temperature set value	80°
Language	English
Operator name	CUSTOMER

4.2.1 Modes

Winter operation	The boiler controls the heating and hot water heating according to the timed program settings. If there is no heat consumption, the boiler stays at the temperature and switches to "Stand by".
Summer operation <i>Systems without storage</i>	The boiler only controls the hot water heating according to the timed program settings. If there is no heat consumption, the boiler switches to "Off".
Summer operation <i>Systems with storage</i>	The boiler regulates domestic hot water (DHW) heating according to the DHW tank loading times, which have been set. After heating the domestic hot water the boiler switches to "Off".
Transitional operation <i>Systems without storage</i>	The boiler controls the heating and hot water heating according to the timed program settings (heating times, boiler loading times), but only within the heating phases ("Boiler times" parameter menu). If there is no heat consumption during the heating phase, the boiler stays at the temperature and switches to "Stand by". Outside the heating phase the boiler switches to "Off".
Transitional operation <i>Systems with storage</i>	If the temperature falls below the "Store up min. temp.", the boiler is turned on within the specified store loading times. If the store is fully loaded, the boiler switches to "Off". Outside the store loading times the boiler also switches to "Off", even if the store is not fully loaded. NOTE: Set a sufficiently large time window (00:00 to 24:00 means that as soon as the value falls below the parameter "Storage up min" the store is immediately fully loaded) NOTE: This is an ideal operating method for systems with storage tanks
Extra heating	 Press and hold the key for 5 seconds: The controller is set to "Party Switching". The boiler switches on for 4 hours; domestic hot water heating and heating circuit controls are activated.
Summer (oil) operation	The boiler controls the domestic hot water heating according to the timed program settings. The secondary boiler (oil, gas etc.) is switched on and off by the boiler for heat generation.
Firewood operation	This mode is for emergency operation with firewood. The fuel feeder units are de-activated NOTE: This mode requires modification with the emergency grate set
Switched off	 Press this key The boiler turns off following the shutdown routine. The system now only regulates the connected heating components.

NOTE

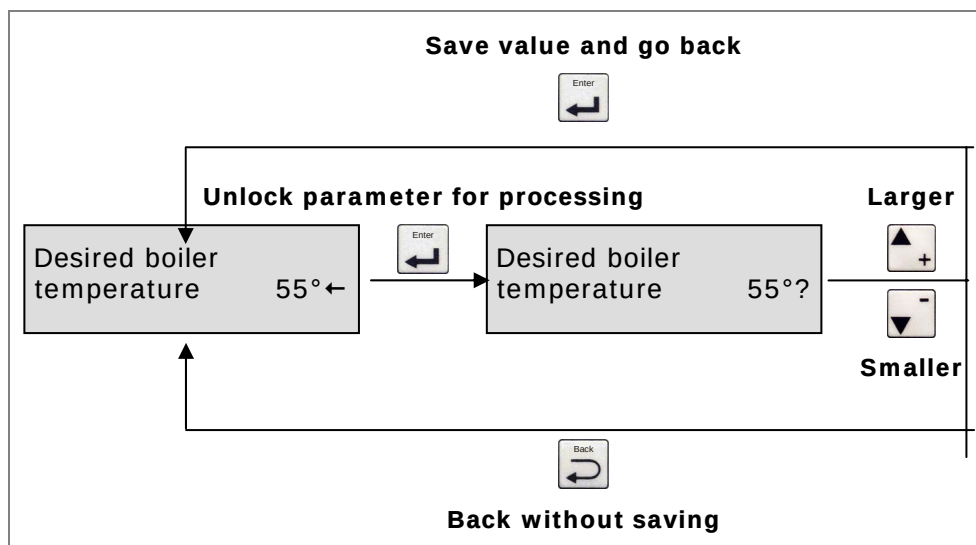
For systems with a storage tank, always select transitional operation!

4.2.2 Operating statuses

Preparation	Back-burn flap is opened, the induced draught fan is switched on and the Lambda probe heats up.
Heating up	The combustion chamber is filled with fuel.
Pre-heating	The fan-assisted ignition switches on and the fuel is pre-heated until a flame forms. During this period the loading unit is deactivated
Ignition	The fuel is ignited with the fan-assisted ignition The flame is spread across the whole combustion chamber. The ID fan, and the loading unit can be set in the "Ignition" menu.
Pre-heating	The stoker is filled up with fuel
Heating	The Lambdatronic controls combustion according to the target boiler values.
Standby	
Shutdown	Back-burn flap is closed All residual material in the stoker channel is fed in as directed.
Blower fan last runnings	The induced draught fan runs at a slower speed to burn up the remaining fuel. No fuel loading unit.
Fault	ATTENTION - Fault! ➡ See chapter 6 - Troubleshooting
Off	This status is reached by pressing the  key when store or DHW tank loading has finished, or after acknowledging an error message, which requires a shutdown. All parts of the boiler are now switched off. The system now only regulates the connected heating components.

4.3 Changing parameters and values

Values are changed as follows:



4.4 Menus

At the client level the following menus are available

SETTING DATA ...	Boiler setting (DHW settings) ...	➤ Page 36, Setting DHW tank temperatures
	Buffer setting ...	➤ Page 36, Setting storage tank temperatures
	Heating circuit 1 ...	➤ Page 37, Setting heating times
	Heating circuit 2 ...	
	Screw time ...	➤ Page 38, Setting screw times
	Shaker motor ...	➤ Page 38, Setting cleaning times
	Boiler times ...	➤ Page 38, Setting boiler times
MANUAL OPERATION ...	➤ 4.4.2, Manual operation menu	
TEST OPERATION ...	➤ 4.4.3, Test operation menu	
ERROR DISPLAY ...	➤ 4.4.4, Error display menu	
ERROR BUFFER ...	➤ 4.4.5, Error buffer menu	

4.4.1 Settings menu

Setting DHW tank temperatures

Boiler setting. (DHW settings) ...	Sanitary water temp. SV (DHW temp. SV) 55°	When the specified temperature is reached in the DHW tank, the DHW tank loading pump switches off.
	DHW 2 temp. SV 55°	
	Reload when DHW below 45°	Reloading of the DHW tank is authorised when the DHW tank temperature is below this level.
	Start of 1st charge (Start of 1st loading) 05:00	Start of authorisation for 1st DHW tank loading session
	End of 1st charge (End of 1st loading) 08:00	End of authorisation for 1st DHW tank loading session
	Start of 2nd charge (Start of 2nd loading) 17:00	Start of authorisation for 2nd DHW tank loading session
	End of 2nd charge (End of 2nd loading) loading process 20:00	End of authorisation for 2nd DHW tank loading session

Setting storage tank temperatures

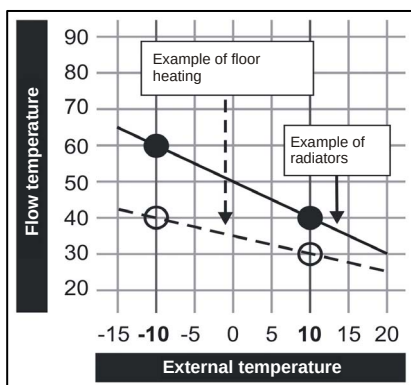
Buffer setting ...	Heating on at buffer over 30°	This is the minimum value for launching the heating circuit in combination with a storage tank. (applies to sensor 1 in conjunction with storage tank)
	Buffer upper min. temp. 65°	Below this temperature the upper store must drop, so that the boiler can be started within the store loading times (in transitional operation).
	Storage low = Boiler temp. - 10°	The storage is considered to be loaded when the "Storage lo. temperature" has reached the boiler temperature minus the set value. → The boiler switches to "Off".

Setting heating times

Heating circuit 1...	Heating curve ...	Flow temp. At external -10°C 60°	You can adjust the heating curve to the relevant system in these two work points.
Only in conjunction with heating circuit control.		Flow temp. At external $+10^{\circ}\text{C}$ 40°	

Weekly program ...	Mo Tu We Th Fr Sa Su 1 1 3 1 1 2 5	For heating circuit 1, heating time programs 1-7 are assigned to the days of the week.
---------------------------	---------------------------------------	--

Heating prog. ...	Heating prog.1 ...	Heating phase 1 Start 06:00
		Heating phase 1 End 06:00
		Heating phase 2 Start 06:00
		Heating phase 2 End 06:00



Heating prog.2 ...	: : : :	You can program up to 7 heating programs each with two heating phases. Lowered outside of heating operation. In the "Weekly program" parameter these are assigned to individual days of the week.
Heating prog.7 ...		

Room temp. set value	20°	Target room temperature value during heating → only with remote control
Room temp. SV reduced amount	16°	Target room temperature value during heating → only with remote control
Ex. temp. heating limit	18°	If the outside temperature exceeds this heating limit during heating, the heating circuit pump and mixer are switched off.
Outside temp. Heating limit Drawdown mode7°		If the outside temperature exceeds this heating limit during drawdown, the heating circuit pump and mixer are switched off.

Heating circuit 2...	Programming as in heating circuit 1
-----------------------------	-------------------------------------

Setting screw times

Screw time ...	Maximum loading rate	17%	Maximum loading rate relative to possible total feed time of a cycle. Example: Maximum loading rate = 17%, calculated loading from controls = 50%, Cycle time: 5s; -> $0.17 \times 0.5 = 0.085$ The feed screw is switched on 8.5% of the max. cycle time The rest is pause time.
	Burn maintaining feed time	15s	Continuous runtime of the feed screw for a burn maintaining cycle (The stoker screw is activated for this time and the stoker emptying time)
	Burn maintaining pause time	16m	When this time has passed, a burn maintaining cycle is started in the constant burn.
	Ash screw cycle time	5m	Specifies how long the feed screw must be on in total for the ash screw cycle to start.
	Ash screw feed time	20s	Runtime of the ash screw in the ash screw cycle.

Setting cleaning times

Shaker motor ...	How long should I vibrate	2s	Shaker duration in a shaking cycle.
	After what charge time (After what loading time)	30s	Specifies how long the stoker screw must be on in total for the shaker cycle to start.
	I can start at	00:00	Heat exchanger operation is only authorised within this time window.
	I must stop at	24:00	
	Cleaning at	00:00	Desired time for cleaning (00:00 = do not carry out any cleaning)

Setting boiler times

Boiler times ... Only effective in transitional operation!	Start of the 1st heating phase	05:00	For systems without storage tank in transitional operation: The boiler is activated within these time windows. IMPORTANT: DHW tank loading times must be within the time window of the boiler times.
	End 1. heating period	08:00	
	Start of 2nd heating period	17:00	
	End of 2nd heating period		
	Start of buffer charging	05:00	For systems with storage tank in summer and transitional operation: The boiler is switched on if the temperature falls below the "Store up. min. temp." during these time windows.
	End of buffer charging	22:00	

Setting the mode, date and time

Mode Winter operation	You can select from: Winter operation Summer operation Transitional operation Firewood operation (EMERGENCY OPERATION)
--	--

Set day	Set the current date.
Set time	Set the current time.

4.4.2 Manual operation menu

Manual operation is only used for manual fuel loading into the chamber and for manual ignition of the fuel:

MANUAL OPERATION ...	Man. fuelling in com. chamb.	Off	⚠ IMPORTANT Danger of overfilling and flash-fires!
	Ignition alone switch on	Off	

4.4.3 Test operation menu

This menu is for operating individual units for testing and for troubleshooting:

TEST OPERATION...	Start cleaning	OFF
	Feed screw forward/back	OFF
	Stoker screw forward/back	OFF
	BBF get open	OFF
	Cellwheel lock forward/back	OFF
	Dischar. conv. forward/back (Dischar. screw forward/back)	OFF
	Ash conv. forward/back (Ash screw forward/back)	OFF
	Heat-exchanger drive	OFF
	Tipping drive	OFF

4.4.4 Error display menu

To display the error messages currently occurring.
[➤ Possible error messages see page 52, 6.4 Error message list](#)

4.4.5 Error buffer menu

Up to 25 warnings/errors already eliminated and the respective times are stored here.

Warning 20/02/07 005 clr. 13:17:24	Remote control 2 error	clr ... cleared: Error no. 005 was eliminated at this time.
Warning 20/02/07 005 ack. 13:16:23		ack ... acknowledged: Error no. 005 was acknowledged at this time.
Warning 20/02/07 005 occ. 13:15:18		occ ... occurred: Error no. 005 occurred at this time.

To display the respective error text press the enter key, e.g.: "Remote control 2 faulty".
[➤ Possible error messages see page 52, 6.4 Error message list](#)

5 Boiler servicing

5.1 General information on maintenance



DANGER

Working on electrical components.

Serious injuries from electric shocks!

- ☐ Work on electrical components should only be carried out by authorised technicians



WARNING

Do not carry out maintenance when the boiler is hot!

Hot parts and the flue pipe can cause serious burns!

- ☐ Protective gloves should generally be worn when working on the boiler.
- ☐ Only operate the boiler using the handles provided for this purpose.
- ☐ Insulate the flue pipes or simply avoid touching them during operation.



Before starting any maintenance work:

- ☐ Turn off the boiler with the  key and allow it to cool down



WARNING

Non-permitted cleaning and maintenance!

Incorrect or insufficient cleaning and maintenance of the boiler can cause serious faults in combustion (e.g. spontaneous combustion of carbonisation gases / flash fires) and this can lead to serious accidents and damage to property!

Only clean the boiler when it is at the status "Boiler off" and in accordance with the instructions. Follow the boiler operating instructions.



5.2 Inspection, cleaning and maintenance

- ☞ Regular cleaning of the boiler extends its life and is a basic requirement for smooth running based on output.
So clean the boiler regularly!

5.2.1 Inspection

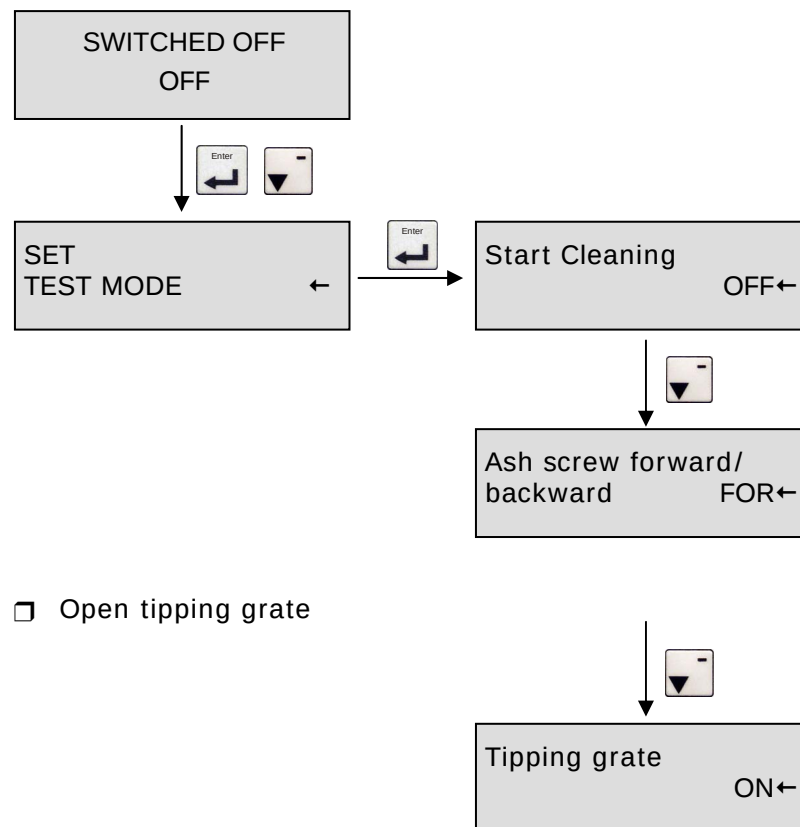
Checking the level of the ash

The ash box must be emptied at appropriate intervals depending on energy requirement and fuel quality.

- ☐ Open the insulating door and combustion chamber door
- ☐ Carry out a visual inspection of the combustion chamber for dirt

In the “Test operation” menu of the system:

- ☐ Turn on the ash screw

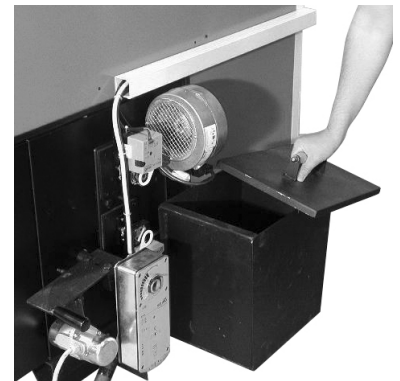


- ☐ Open tipping grate

- ☐ Tip up the burn-out opening and feed the ash in the combustion chamber downwards
 - ➡ The ash screw feeds the ash that falls onto it into the ash box.
- ☐ Clean the combustion chamber and chamber
- ☐ In test operation stop the ash screw and close the tipping grate



- ☐ Remove the lid of the ash box and check the level of ash
- ☐ If necessary remove the ash box from the screw channel and empty it



Checking the thermal discharge safety device

- ☐ Check the seal of the discharge valve
 - ➡ The discharge pipe must not drip
 - ☞ Exception: boiler temperature > 95 °C

If water is dripping from the discharge pipe:

- ☐ Clean the discharge safety device or have the installer replace it if necessary



Check the safety valve as per the manufacturer's specifications

Checking the system pressure

- ☐ Check the system pressure on the pressure gauge
 - ➡ The value must be 20% over the pre-stressed pressure of the expansion tank
 - ➡ [Expansion tank operating instructions](#)

If the system pressure decreases:

- ☐ Top up with water
 - ☞ If this occurs frequently, the seal of the heating system is faulty!
Inform your installer!

If there are large pressure fluctuations:

- ☐ Have the expansion tank checked.



Checking the drive motors

- ☐ Carry out a visual inspection of the stoker screw and ash screw to check the seal
 - ➔ There must not be any leaking lubricant.
-  If lubricant is leaking, inform the installer or Fröling factory customer services

5.2.2 Monthly cleaning***Cleaning the combustion chamber***

- ☐ Open the insulating door and combustion chamber door
- ☐ Remove the burn-out opening
- ☐ Remove dirt from the burn-out opening with a brush

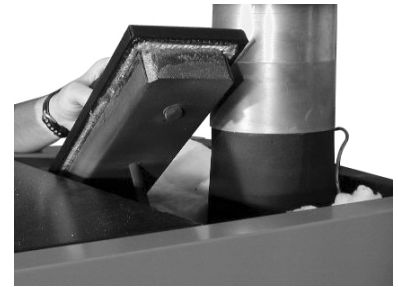


- ☐ Open out the ash baffle plates at the back of the combustion chamber and clean
- ☐ Remove build-up of soot on the side-walls with the ash scraper
- ☐ Carry out a visual inspection of the surface of the refractory brick for damage

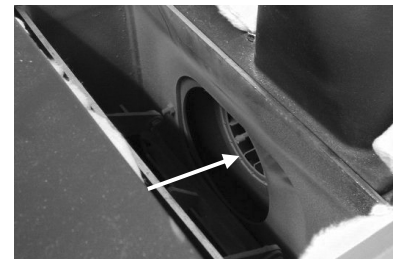


Cleaning the heat-exchanger and flue gas collection chamber

- ☐ Loosen screw on the top cleaning port cover
- ☐ Remove the cleaning cover



- ☐ Clean the flue gas collection chamber and the opening to the induced draught fan with a brush
- ☐ Remove any ash which has fallen down.



-  We recommend that you use an ash vacuum



Removing ash from the cleaning system

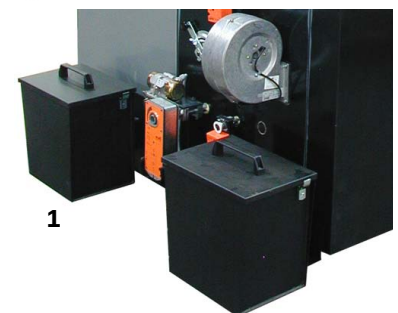
For the Turbomatic 28-55:

- ☐ Open the side cleaning access door and remove the ash
-  We recommend that you use an ash vacuum



For optional automatic heat exchanger de-ashing:

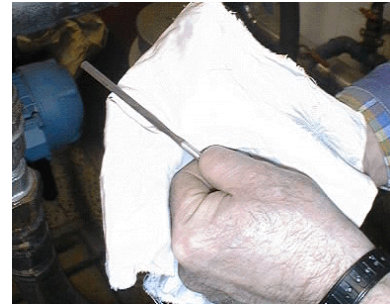
- ☐ Empty rear ash box (1)



Cleaning the flue gas sensors

At the flue pipe:

- ☐ Loosen the threaded pin and take out the flue gas sensor
- ☐ Wipe off the flue gas sensor with a clean cloth
- ☐ Slide in the flue gas sensing element and secure it hand-tight using the threaded pin



5.2.3 Annual Check

- ☞ Carry out annually or at least after 1500 hours of operation.
- ☐ Turn off the main switch in the switch cabinet for yearly maintenance



Cleaning the smoke flue pipe

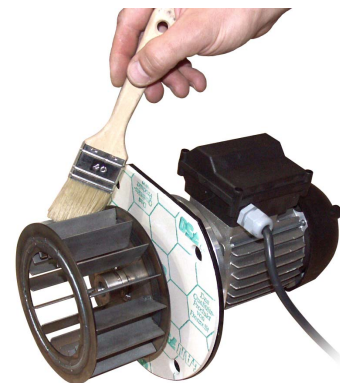
- ☐ Clean the connecting pipe between the boiler and the chimney regularly with a chimney sweeping brush
- ☞ Depending on the layout of the flue pipes and the chimney draught cleaning yearly may not be enough!
The cleaning interval should be adjusted accordingly.

Checking the draught controller flap and explosion flap

- ☐ Check the draught controller flap and explosion flap for ease of operation
 - ☞ If they become difficult to move they must be changed immediately!
 - For settings see [page 17, Boiler data for constructing the flue gas system](#)

Cleaning the induced draught fan

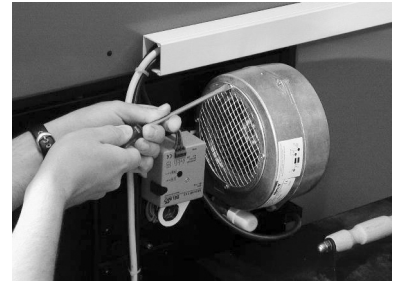
- ☐ Detach the induced draught fan on the back of the boiler
- ☐ Check for dirt and damage
- ☐ Clean the blower wheel with a soft brush or paint brush
 - ☞ Do not move the balancing weights on the blower wheel!



Cleaning the combustion air blower fan

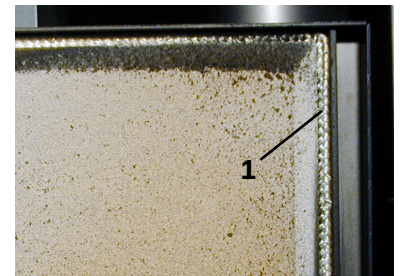
- ☐ Remove 4 screws from the fan and take off the protective grill.
- ☐ Clean the propeller and protective grill (cloth, compressed air, ...)
- ☐ Replace the protective grill and fix it with the screws

- ☐ Turn the main switch on the switch cabinet back on



Checking the combustion chamber door

- ☐ Close the combustion chamber door and check the seal
- ☐ Check fibre-glass seal (1) for perfect alignment on the door frame
 - ➔ Imprint in the fibre-glass seal



If the seal is coloured black at several points or the imprint is disjointed:

- ➔ The seal is no longer efficient.
- 👉 Tighten the door latches or replace the fibre-glass seal

Clean the combustion chamber beneath the ash baffle plates



- ☐ Remove the front insulation from the chamber and dismantle the inspection cover (1)
- ☐ Remove ash from beneath the ash baffle plates
- ☐ Open out the ash baffle plate and clean
- 👉 The illustrations above show the installation setup of the stoker unit on the left. For the stoker unit on the right, the ash baffle plates are behind the ash screw!

5.3 Instructions for Measuring Emissions

5.3.1 Measurement at rated load

- ☐ Ensure the highest possible heat consumption:
 - Ensure that the heating pumps are turned on
 - Open mixer valves and radiator valves
 - Set the boiler loading time to the current time
 - Set the boiler nominal temperature to 85°C

You can measure when:

- Flue gas temperature is around 170°C
- CO₂ content of the flue gas is between 8 and 12%
- Boiler temperature is over 65°C

5.3.2 Measurement at partial load (if required)

- ☐ Ensure heat consumption:
 - Ensure that the heating pumps are turned on
 - Open mixer valves and radiator valves
 - Set the boiler loading time to the current time
- ☐ Enforce partial load:
 - After measuring at rated load the boiler nominal temperature should sink to 5°C

You can measure when:

- Flue gas temperature is around 140°C
- CO₂ content of the flue gas is between 10 and 14%
- Boiler temperature is over 65°C

-  After measurement all adjusted parameters (e.g. boiler load time, ...) must be set back to their original values

5.4 Maintenance agreement / customer service

 Guarantee a long service-life with a service agreement!

Regular maintenance and servicing by a heating specialist will ensure a long, trouble-free service life for your heating system.

Regular servicing will ensure that your system stays environmentally-friendly and operates efficiently and cost-effectively.

For this reason, FRÖLING offers a service agreement, which optimises operating safety. Please see the details in the accompanying guarantee certificate.

Your Fröling customer service office is also glad to provide consultation.

5.5 Replacement parts

With Fröling original replacement parts in your boiler, you are using parts, which are perfectly co-ordinated to work together. As the parts fit together so well, installation times are shortened and lifespan is maintained.

NOTE

Installing non-original parts voids the guarantee!

- ☐ Only replace components or parts with original replacement parts

6 Troubleshooting

6.1 General faults in power supply

Error	Cause of error	Error correction
Nothing is shown on the display No power to the controls	• General power failure • FI circuit breaker or line protection is switched off • Main switch is turned off • Defective fuse in the controls	☐ Switch on the FI circuit breaker or line protection ☐ Turn on the main switch ☐ Turn off the main switch ☐ Replace fuse – note current (e.g. 10AT) ☐ Turn on the main switch

6.1.1 System procedure following power failure

When the power supply has been restored the boiler returns to the previously specified mode and is controlled according to the specified program.

6.2 Excessive temperature



The safety temperature limiter (STL) shuts down the boiler when it reaches a temperature of approx. 100°C. After the boiler has cooled down, the STB must be manually unlocked:

- ☐ Unscrew the cap on the STB (1)
- ☐ Reset the safety temperature limiter by pressing with a screw-driver.
- ☐ Replace the cap

6.3 Errors with error messages



If a fault has occurred and has not yet been cleared:

- ➡ Status LED (1) flashes red
- ➡ An error message is shown on the display (2)

An internal distinction is made between 3 types of message:

Warning	Boiler continues running
Error	Boiler follows shutdown procedure
Fault	Boiler shuts down immediately, heating circuit controls and pumps remain active

6.3.1 Procedure for error messages

- ☐ Find and eliminate the error
- ☐ Acknowledge the error by pressing the  key
 - ➡ Automatic troubleshooting is started
 - 👉 Only when troubleshooting is activated

When automatic troubleshooting has finished (approx. 20 min):

- ☐ Start the boiler with the  key

6.4 Error message list

Error messages in alphabetical order

👉 Error messages highlighted in grey do not affect Turbomatic and standard units.

Error message	Code	Cause of error	Error correction
Exh. gas temp. sensor not OK!	14	Flue gas temperature sensor defective	☐ Check sensor and sensor cable and change if necessary
Discharge empty level measure!	22	<i>The level measure sensor is not active:</i> - Level sensor defective - No fuel in the store - Discharge screw motor defective - Bridge formation in the gravity shaft or discharge screw	☐ Check the sensor and connection cable and change if necessary ☐ Check the quantity of fuel in the store and refill if necessary ☐ Check the motor and connection cable and change if necessary ☐ Open the gravity shaft lid and remove bridge
All limit switch cross feed-activ. (for stoker/cross feeder)	47	Limit switch or connection cable defective	☐ Check the limit switch and connection cable and change if necessary
All limit switch stoker activated (for stoker/cross feeder)	46	- Limit switch blocked - Limit switch manually activated	☐ Check that the limit switch moves easily and change if necessary
DHW 2 sensor not OK	78	Temperature sensor in DHW tank 2 defective	☐ Check sensor and sensor cable and change if necessary
Boiler temp. sensor not OK! (DHW temp. sensor not OK!)	13	Temperature sensor in DHW tank defective	☐ Check sensor and sensor cable and change if necessary
Pressure system error message	68	- Pressure system defective - System pressure has sunk beneath a set minimum value	☐ Troubleshooting following the manufacturer's instructions for the pressure system
Fall chute cover is open! (Gravity shaft lid open!)	6, 45	<i>The limit switch in the gravity shaft lid was activated</i> - The gravity shaft lid was opened by jammed material or manually - Limit switch defective	☐ Remove the jammed material and close the gravity shaft lid ☐ Check the position switch and change if necessary
Fall chute empty (level sensor!) (Gravity shaft empty (level sensor!))	11	<i>The level sensor in the gravity shaft was not activated within a specified time:</i> - Level sensor defective - No fuel in the store - Feed screw blocked - Bridge formation in the gravity shaft - Feed screw motor defective	☐ Check level sensor and connection cable and change if necessary ☐ Check the quantity of fuel in the store and refill if necessary ☐ Remove jammed material ☐ Open the gravity shaft lid and remove material bridge ☐ Check the motor and connection cable and change if necessary

Error message	Code	Cause of error	Error correction
Fall chute full 23 (Gravity shaft full 23) (for stoker/cross feeder)	54	<i>The level sensor is still active after a specified time has passed:</i> - Level sensor defective - Bridge formation in the gravity shaft - Cross feeder drive defective	☐ Check level sensor and connection cable and change if necessary ☐ Open the gravity shaft lid and remove material bridge ☐ Check the drive and connection cable and change if necessary
Fall chute full (level sensor!) (Gravity shaft full (level sensor!))	10	<i>The level sensor is still active after a specified time has passed:</i> - Level sensor defective - Bridge formation in the gravity shaft - Stoker screw motor defective	☐ Check level sensor and sensor cable and change if necessary ☐ Open the gravity shaft lid and remove material bridge ☐ Check the stoker motor and connection cable and change if necessary
Fall chute is not full 28 (Gravity shaft is not full 28) (for stoker/cross feeder)	59	<i>The level sensor in the gravity shaft was not activated within a specified time:</i> - Level sensor defective - No fuel in the store - Feed screw blocked - Bridge formation in the gravity shaft - Feed screw motor defective	☐ Check level sensor and sensor cable and change if necessary ☐ Check the quantity of fuel in the store and refill if necessary ☐ Remove jammed material ☐ Open the gravity shaft lid and remove material bridge ☐ Check the motor and connection cable and change if necessary
Remote cont. 1 sensor not OK!	28	Room temperature sensor defective	☐ Check sensor and sensor cable and change if necessary
Remote cont. 2 sensor not OK!	29	Room temperature sensor defective	☐ Check sensor and sensor cable and change if necessary
Comb. temp. sensor not OK!	15	Ceramic sensor defective	☐ Check sensor and sensor cable and change if necessary
Combustion chamb door open	32	- Combustion chamber door open - Door contact switch defective	☐ Check the combustion chamber and close the doors ☐ Check the door contact switch and connection cable and change if necessary
Comb. chamber overpres.not OK!	9	Overpressure in combustion chamber NOTE: After acknowledging the error, error correction starts immediately. Keep the doors of the boiler closed! ☐ After error correction starts, check if the induced draught fan is running CAUTION! In case of defective induced draught fan inform the heating engineers or Fröling customer services! After successful troubleshooting: ☐ Open the insulating door and combustion chamber door ☐ Clean combustion chamber of embers and fuel ☐ Clean the flue gas guide in the boiler up to the mouth of the chimney	☐ Acknowledge error

Error message	Code	Cause of error	Error correction
Delivery piston RETURN overtime (for stoker/cross feeder)	37	<i>The delivery piston was not opened within the specified time:</i> - Limit switch defective - Delivery piston blocked	☐ Check the limit switch and connection cable and change if necessary ☐ Remove foreign body
Delivery piston FORWARD overtime (for stoker/cross feeder)	36	<i>The delivery piston was not closed within the specified time:</i> - Limit switch defective - Delivery piston blocked	☐ Check the limit switch and connection cable and change if necessary ☐ Remove foreign body
Heating attempt unsuccessful! (for systems without autom. ignition)	7	<i>The boiler attempts to ignite the fuel with any embers that may be present, but within a specified time it has not reached "Heating" status:</i> - Not enough fuel in the chamber - Stoker not feeding	☐ Check the quantity of fuel in the store and refill if necessary ☐ Check the settings for the "Charge time without ign." (Loading time without ign.) parameter ☐ Check stoker drive ☐ Ignite fuel manually
Hydraulic oil level/ temp. (for walk floor)	34	- Oil quantity in hydraulic unit too low - Oil temperature in hydraulic unit too high	☐ Troubleshooting following the manufacturer's instructions for the hydraulic unit
Hyd. motor prot. fall chute (Hyd. motor prot. gravity shaft) (for stoker/cross feeder)	35	<i>Motor protection of the hydraulic motor or the limit switch in the gravity shaft lid has activated</i> - Gravity shaft lid blocked - Material blockage in gravity shaft - Limit switch defective	☐ Check gravity shaft lid ☐ Remove jammed material ☐ Check the limit switch and connection cable and change if necessary
Boiler ret.circ. temp. not OK!	12	Boiler return circuit sensor defective	☐ Check sensor and sensor cable and change if necessary
Boiler temp. sensor not OK	2	Boiler temperature sensor defective	☐ Check sensor and sensor cable
Boiler temp. low	65	<i>The boiler temperature has gone below the level set to activate a warning:</i>  Mainly for large systems with remote diagnosis!	
Communication to Turbomatic Module damaged	76	<i>Connection to Turbomatic module has been interrupted.</i> Connection cable defective	☐ Check board and cable and change if necessary
Lambda probe not OK!	16	Lambda probe defective	☐ Check sensor and sensor cable and change if necessary ☐ Check power supply

Error message	Code	Cause of error	Error correction
Motor prot.fault ash conv.! (Motor prot. fault discharge screw!)	40	<i>The motor overload switch of the ash screw has cut out because of overload:</i> - Ash screw blocked - Motor overheated or defective	☐ Remove jammed material ☐ Check the motor and connection cable are working and change if necessary
Motor prot. fault discharge conv.! (Motor prot. fault discharge screw!)	20	<i>The motor overload switch of the discharge screw has cut out because of overload:</i> - Discharge screw blocked - Motor overheated or defective	☐ Move discharge briefly forwards and backwards in test operation ☐ See 4.4.3 Test operation menu If the fault cannot be resolved in this way: ☐ Remove jammed material ☐ Check the motor and connection cable are working and change if necessary
Motor prot.fault delivery conv.! (Motor prot. fault discharge screw!)	4	<i>The motor overload switch of the feed screw has cut out because of overload:</i> - Feed screw blocked - Motor overheated or defective	☐ Move feed screw briefly forwards and backwards in test operation ☐ See 4.4.3 Test operation menu If the fault cannot be resolved in this way: ☐ Remove jammed material ☐ Check the motor and connection cable are working and change if necessary
Motor prot.fault hyd. pump floor	33	<i>The motor overload switch has cut out because of overload:</i> - Connected components blocked by foreign body - Connected component is overheated or defective	☐ Check the pump/motor for foreign bodies ☐ Check the pump/motor and connection cable are working and change if necessary
Motor prot.fault hyd. pump-grate	42		
Motor prot.fault boilerpump	72		
Motor prot.fault stoker/cross pump	44		
Motor prot.fault stoker conv.! (Motor prot.fault stoker screw!)	5	<i>The motor overload switch of the stoker screw has cut out because of overload:</i> - Stoker screw blocked - Motor overheated or defective	☐ Move stoker screw briefly forwards and backwards in test operation ☐ See 4.4.3 Test operation menu If the fault cannot be resolved in this way: ☐ Remove jammed material ☐ Check the motor and connection cable are working and change if necessary

Error message	Code	Cause of error	Error correction
Motor prot. fault comb. air fan	31	<i>The motor overload switch of the combustion air blower fan has cut out because of overload:</i> - Fan blocked - Motor overheated or defective	☐ Remove foreign body ☐ Check the motor and connection cable are working and change if necessary
Motor prot. fault cellwheel lock!	17	<i>The motor overload switch of the rotary valve has cut out because of overload:</i> - Rotary valve blocked - Motor overheated or defective	☐ Move rotary valve briefly forwards and backwards in test operation ➤ See 4.4.3 Test operation menu If the fault cannot be resolved in this way: ☐ Remove blocked material or foreign body ☐ Check the motor and connection cable are working and change if necessary
Motor prot. fault feeder <i>(instead of stoker/cross feeder)</i>	74	<i>The motor overload switch of the feeder has cut out because of overload:</i> - Feeder blocked - Motor overheated or defective	☐ Remove foreign body ☐ Check the motor and connection cable are working and change if necessary
Motor protection (FC) ind. draught	23	<i>The motor overload switch of the frequency converter has cut out because of overload:</i> - Parameters set incorrectly on frequency converter - ID fan/ fan blocked - ID fan overheated or defective	☐ Check the parameter settings on the frequency converter ☐ Remove foreign body ☐ Check the motor and connection cable are working and change if necessary
Circ. pressure signal faulty	64	<i>Signal from the network pump controls is missing or is incorrect</i> Signaller defective	☐ Check the signaller and connection cable are working and change if necessary
Circ. pump 1 FC fault	62	<i>The motor overload switch of the frequency converter has cut out because of overload:</i> - Parameters set incorrectly on frequency converter - Pump blocked - Pump defective	☐ Check the parameter settings on the frequency converter ☐ Remove foreign body ☐ Check the motor and connection cable are working and change if necessary
Circ. pump 2 FC fault	63		
Oil boiler error message	71	Oil boiler shows fault	☐ Troubleshooting as per oil boiler manufacturer's instructions

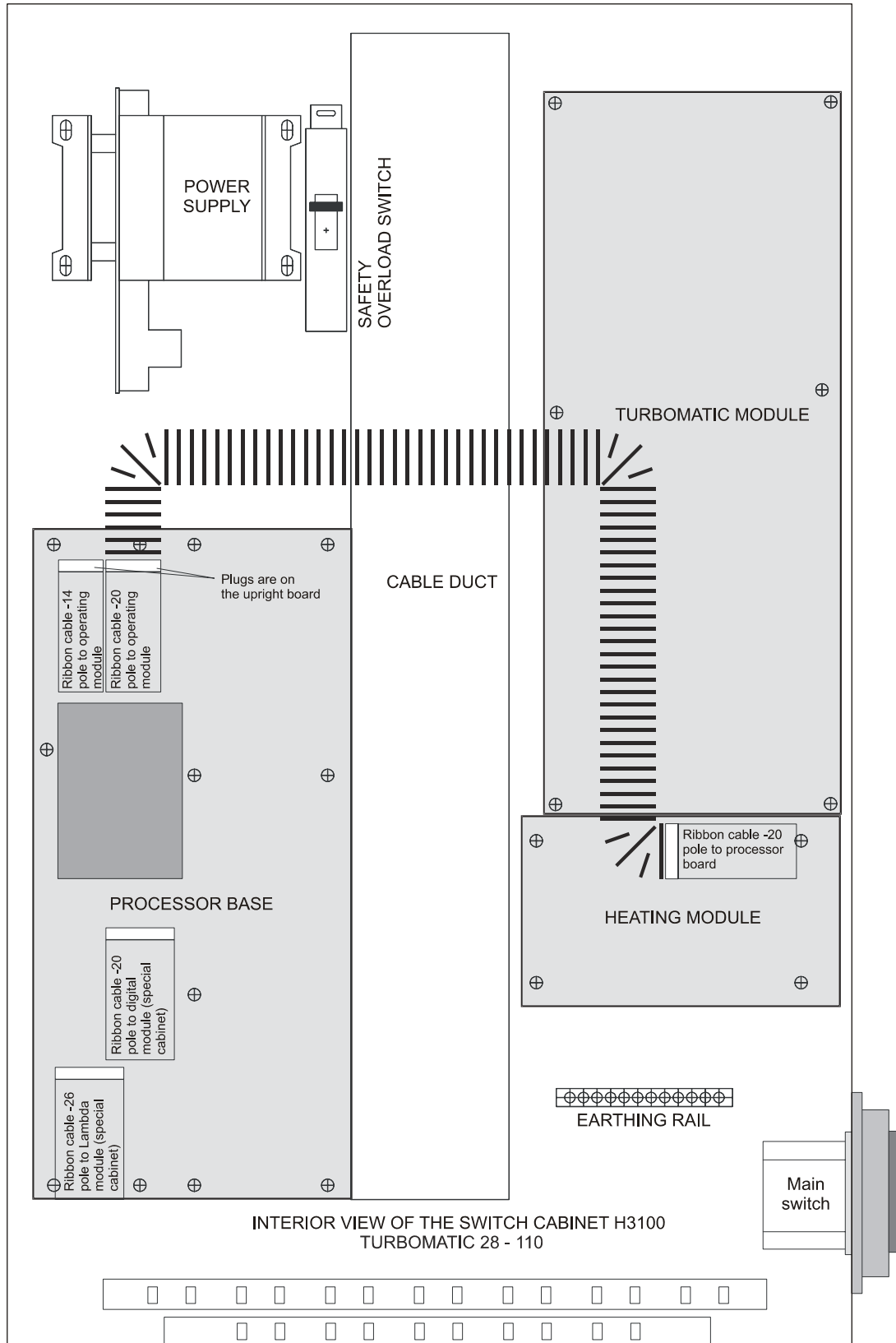
Error message	Code	Cause of error	Error correction
Oil tank temp. sensor not OK!	30	Temperature sensor in oil boiler defective	☐ Check sensor and sensor cable and change if necessary
Buf. temp. upper sensor not OK!	24	Temperature sensor in top store defective	☐ Check sensor and sensor cable and change if necessary
Buf. temp. lower sensor not OK!	25	Temperature sensor in bottom store defective	☐ Check sensor and sensor cable and change if necessary
Cross feed open over time 24 Cross feed open over-pressure 25 Cross feed close over time 18 Cross feed closed over time 26 Cross feed over-pressure 27 <i>(for stoker/cross feeder)</i>	55 56 49 57 58	<i>The cross feeder has not reached the limit position within a specified time or it is overloaded:</i> - Cross feeder blocked - Drive defective - Limit switch defective	☐ Check the grill in the combustion chamber for jammed foreign bodies and remove if necessary ☐ Check the motor and connection cable and change if necessary ☐ Check the limit switch and connection cable and change if necessary
ERROR ROST (Grate doesn't close)	75	<i>The automatic tipping grate has not reached the "closed" position:</i> - Tipping grate blocked - Tipping drive defective - End stop sensor covered or defective	☐ Check the grill in the combustion chamber for jammed foreign bodies and remove if necessary ☐ Check the actuator and connection cable and change if necessary ☐ Check the sensor and connection cable and change if necessary
Back burn!!! sprinkler ON	66	<i>Temperature in the stoker channel has exceeded the set value and set off the sprinkler system. Cold water is sprinkled into the stoker canal to prevent a back-burn.</i>	☐ Acknowledge error ☐ Turn off the boiler with the stop key ☐ Check the temperature of the fuel feeder units ☐ Observe the whole system during the shutdown procedure
Back burn flap does not open!	3	<i>The back burn flap has not reached the "open" position within a specified time:</i> - Back burn flap blocked - Flap drive defective	☐ Check the grill in the combustion chamber for jammed foreign bodies and remove if necessary ☐ Check the actuator and connection cable and change if necessary
Back burn flap does not close	61	<i>The back burn flap has not reached the "closed" position within a specified time:</i> - Back burn flap blocked - Flap drive defective	☐ Check the grill in the combustion chamber for jammed foreign bodies and remove if necessary ☐ Check the actuator and connection cable and change if necessary
Return feed temp. 2 sensor not OK	77	Sensor for return feed temperature defective	☐ Check sensor and sensor cable and change if necessary

Error message	Code	Cause of error	Error correction
Boiler ret.circ. tmp.too long low	67	<i>The return feed temperature is too cold for a specified period of time:</i> - Return feed lift sensor defective - Return feed lift pump (bypass pump) defective	☐ Check sensor and sensor cable and replace if necessary ☐ Check the motor and connection cable and change if necessary
Safety time expired!	1	<i>Parameters for heating criteria were too low for longer than the safety time</i> - Fuel supply insufficient - Material bridge in feed system - Stoker drive defective	☐ Check the quantity of fuel in the store and refill if necessary ☐ Check fuel feed units ☐ Remove fuel bridge ☐ Check the stoker motor and connection cable and change if necessary
STB/Emergency- stop activated! (STL/Emergency- stop activated!)	0	<i>The boiler is overheated and the safety temperature limiter has activated:</i> - A pump of the heat consumers is defective - Heating circuit mixer defective - Slide valves/cut-offs manually closed. <i>Emergency off activated:</i> - External heating emergency off activated	☐ Check the pumps and connection cable and change if necessary ☐ Check the mixer and connection cable and change if necessary ☐ Check the slide valves/cut-offs and open if necessary When the boiler has cooled down and troubleshooting has been carried out: ☐ Unlock STL mechanically ☐ Press the START key ☐ Check if emergency off has been activated and resolve errors ☐ Turn on the external emergency off switch ☐ Press the START key
Over-filling of cellwheel lock!	19	<i>The motor overload switch of the rotary valve has cut out because of overload:</i> - Rotary valve blocked - Motor overheated or defective	☐ Move rotary valve briefly forwards and backwards in test operation ➡ See 4.4.3 Test operation menu If the fault cannot be resolved in this way: ☐ Remove blocked material or foreign body ☐ Check the motor and connection cable are working and change if necessary

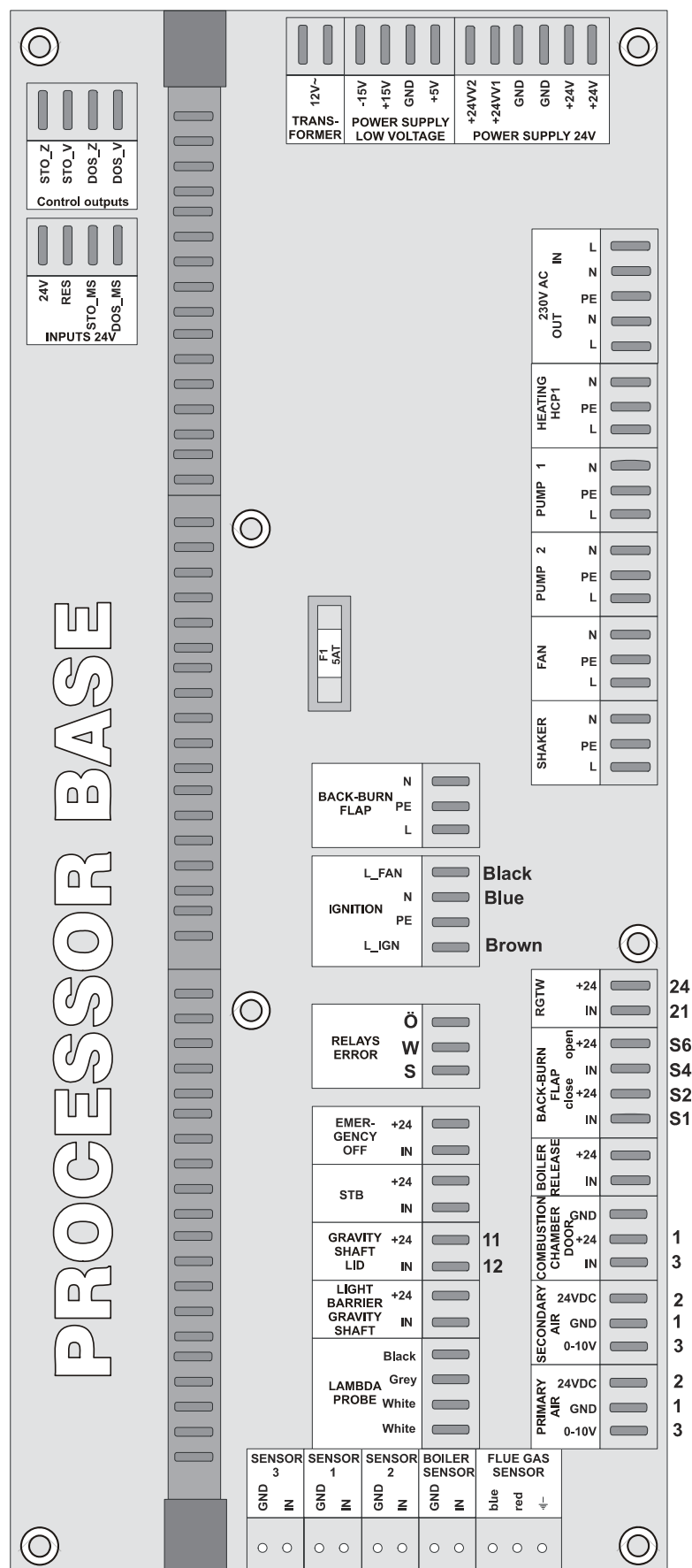
Error message	Code	Cause of error	Error correction
Feeder over-time	73	<i>The feeder has not reached the end stop within a specified time:</i> • Feeder blocked • Drive defective	☐ Remove foreign body ☐ Check the drive and connection cable are working and change if necessary
Flow temp. 1 sensor not OK!	26	• Sensor for flow temperature - heating circuit 1 is defective	☐ Check sensor and sensor cable and change if necessary
Flow temp. 2 sensor not OK!	27	• Sensor for flow temperature - heating circuit 2 is defective	☐ Check sensor and sensor cable and change if necessary
Often overcurrent hydraulic grate	43	<i>The motor overload switch has cut out because of overload:</i> • Grate blocked with foreign body • Grate drive defective	☐ Check the grate for foreign bodies and remove if necessary ☐ Check the drive and connection cable are working and change if necessary
Often overcurrent ash screw conv. (Often overcurrent discharge screw!)	41	<i>Automatic movement back and forward performed too often during blockage</i> • Unit blocked	☐ Remove material blockage or foreign body
Often overcurrent discharge conv.! (Often overcurrent discharge screw!)	21		
Often overcurrent cellwheel lock!	18		
Ignition attempt unsuccessful!	8	<i>Ignition attempt did not succeed during the specified time</i> • Not enough/ no fuel in the chamber • Damp/ incorrect fuel • Ignition attempt too short • Defective ignition	☐ Check the quantity of fuel in the store and refill if necessary ☐ Check fuel feed units  Observe the fuel specifications in the permitted use! ☐ Check the parameters set in the "Ignition" menu ☐ Have the ignition checked by professionals

7 Installers and service technicians

7.1 Lambdatronic H 3100 switch cabinet (Standard)



7.1.1 Base



Cable list

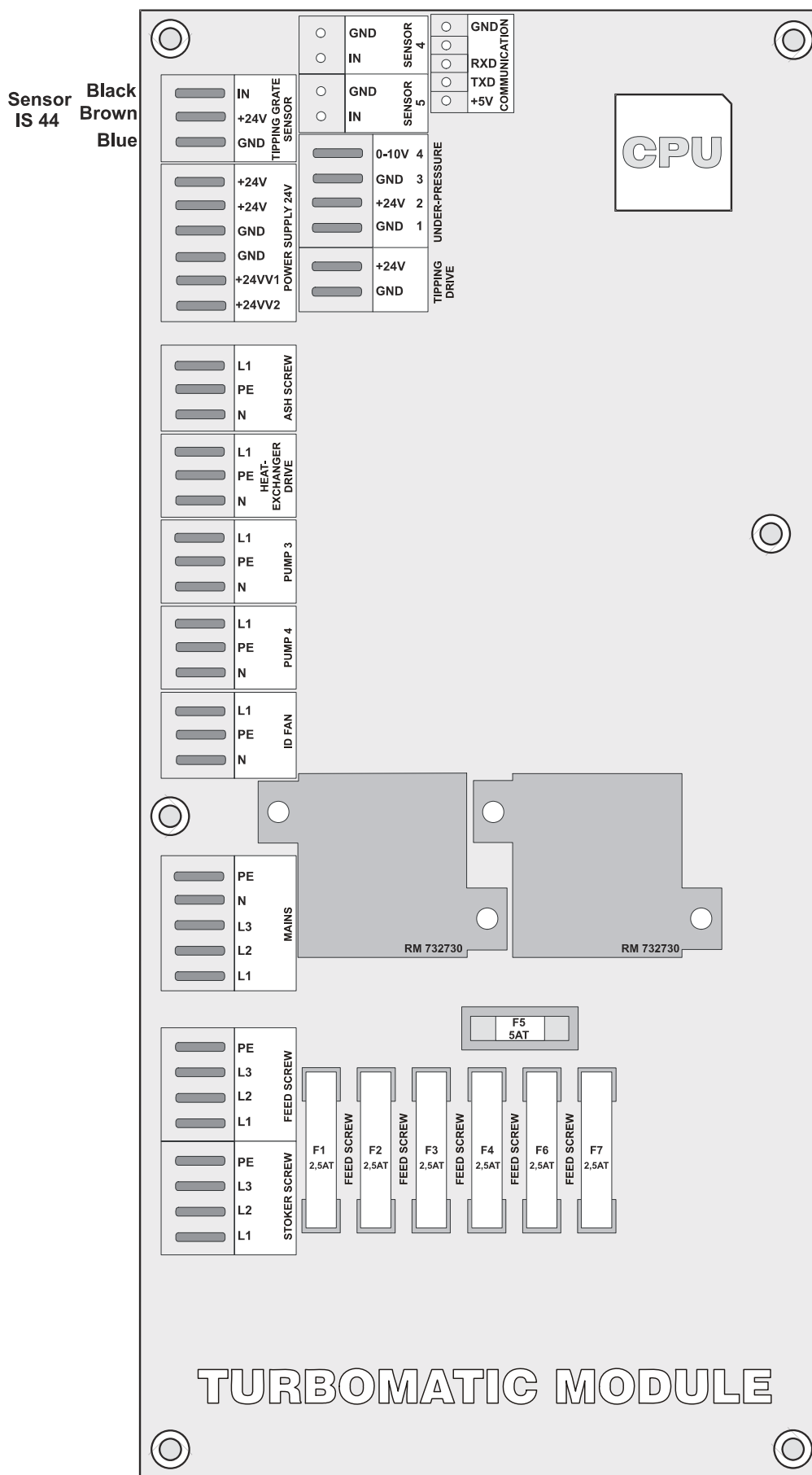
Heating HKP 1	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Pump 1	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Pump 2	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Fan	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Shaker	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5

RGTW	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Back-fire flap limit switch	5 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Boiler Release	2 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Combustion chamber door	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Secondary air	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Primary air	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5

Flue gas sensor	FeCuNi Type J	
Boiler sensor	2 x 0.75 mm ² flexible	
Sensor 2	2 x 0.75 mm ² flexible	
Sensor 1	2 x 0.75 mm ² flexible	
Sensor 3	2 x 0.75 mm ² flexible	

Back-burn flap	2 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Ignition	4 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Relays error	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
EMERGENCY OFF	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Excessive temperature (STL)	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Gravity shaft lid	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Light barrier gravity shaft	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Lambda probe	2 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5

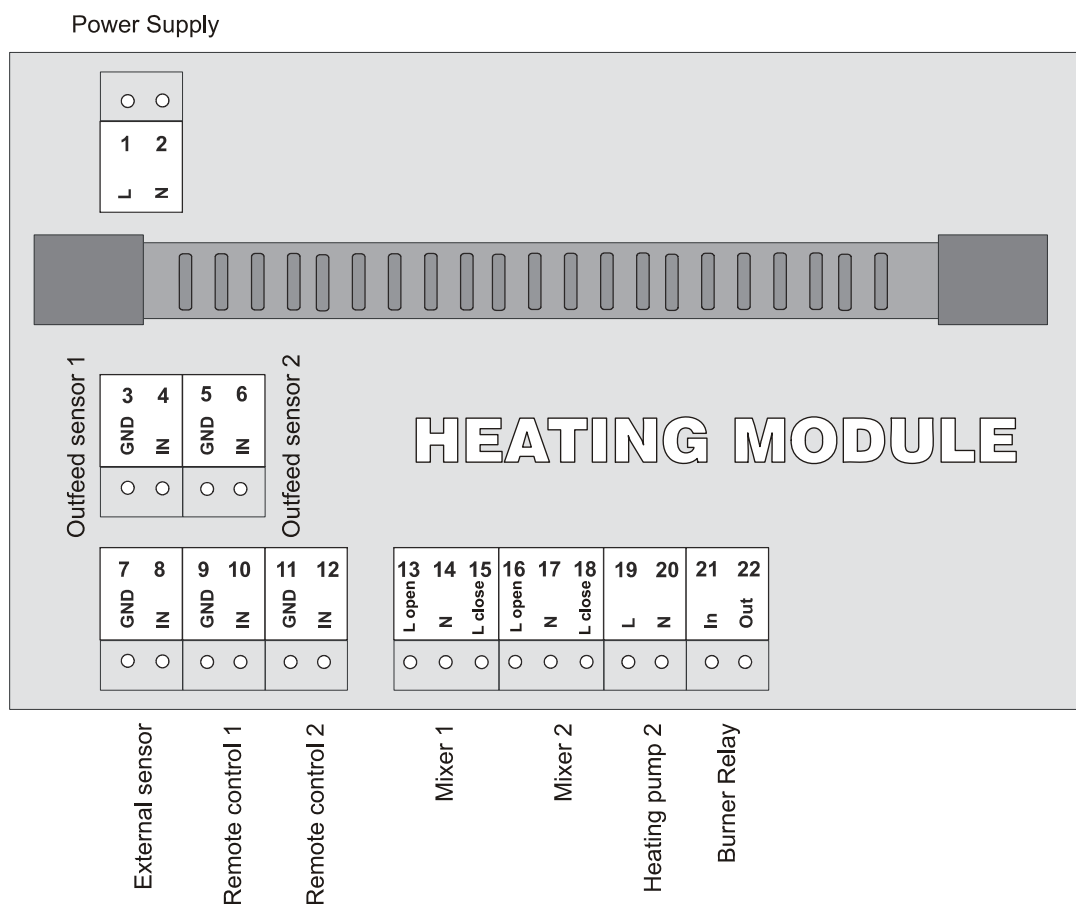
7.1.2 Turbomatic module



Cable list

Stoker screw	4 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Feed screw	4 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
ID fan	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Pump 4	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Pump 3	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Heat-exchanger drive	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Ash screw	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Tipping grate sensor	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Tipping drive	2 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Under-pressure	2 x 1.5 mm ² flexible + 2 x 0.75 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Sensor 5	2 x 0.75 mm ² flexible	
Sensor 4	2 x 0.75 mm ² flexible	

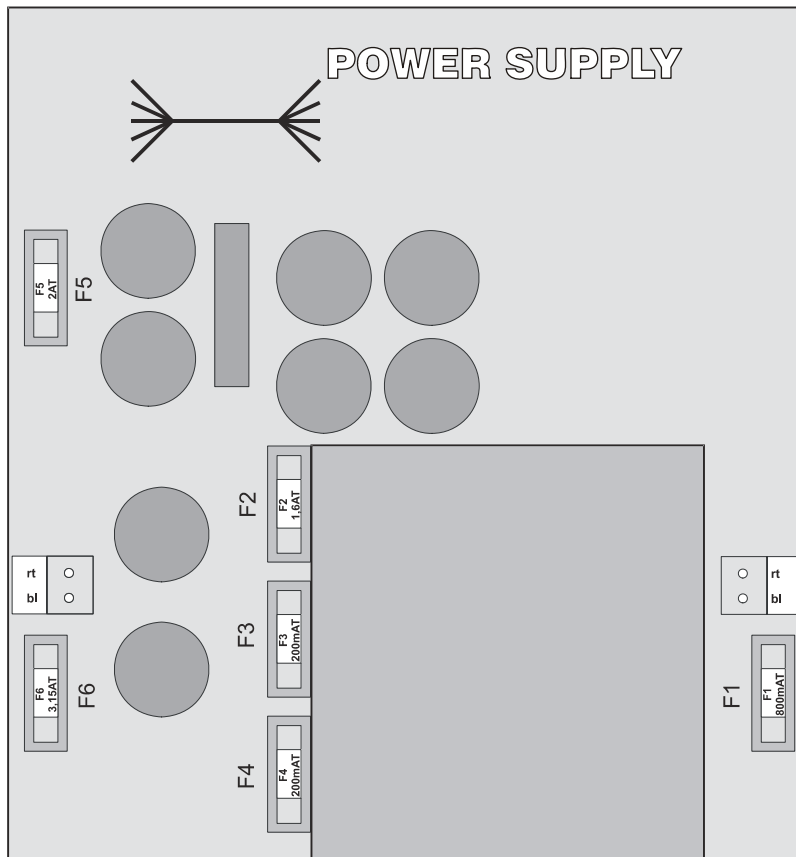
7.1.3 Heating module



Cable list

Heating HKP 2	3 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Mixer 1	4 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Mixer 2	4 x 1.5 mm ² flexible	e.g. YMM as per ÖVE-K41-5 or H05VV-F as per DIN VDE 0281-5
Remote control 1	2 x 0.75 mm ² flexible	
Remote control 2	2 x 0.75 mm ² flexible	
External sensor	2 x 0.75 mm ² flexible	
Outfeed sensor 1	2 x 0.75 mm ² flexible	
Outfeed sensor 2	2 x 0.75 mm ² flexible	

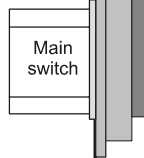
7.1.4 Power Supply



Fuses

F1	800 mA	Fuse for primary transformer In case of defect: - Display shows nothing - No extra-low voltage
F2	1.6 AT	Fuse for power supply 5 VDC In case of defect: - Display shows nothing
F3	200 mA	Fuse for power supply + 15 VDC In case of defect: - Display shows nothing
F4	200 mA	Fuse for power supply - 15 VDC In case of defect: - Display shows nothing
F5	2.0 AT	Fuse for power supply 24 VDC In case of defect: - No error message possible
F6	3.15 AT	Fuse for power supply 12 VAC In case of defect: - O2 value always 13.2%

The Lambdatronic H3101 switch cabinet allows connection through extension boards for when special discharge systems or discharge systems from other manufacturers are used.

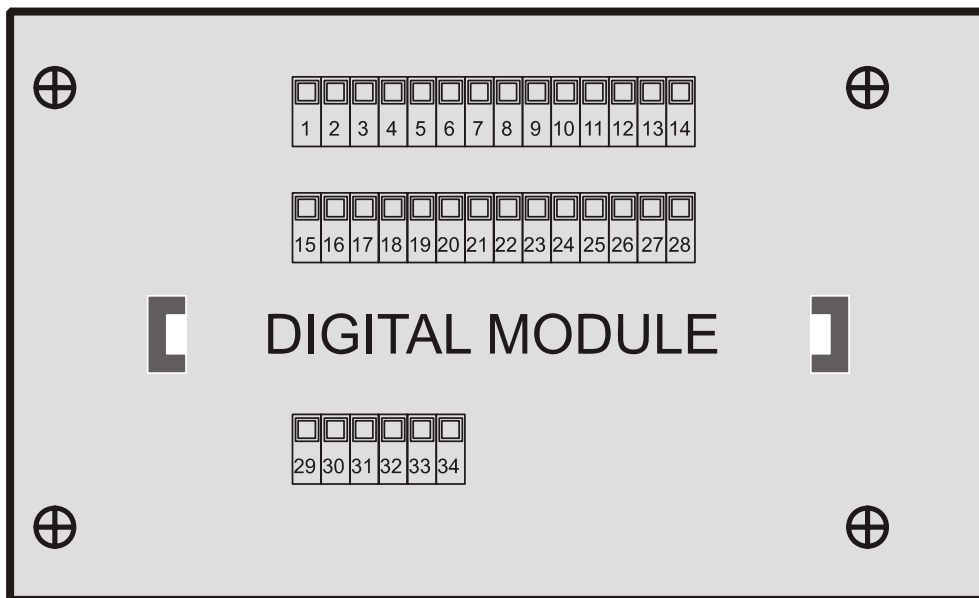


7.2.1 Additional module

Digital module

The digital module extends the standard board with further inputs and outputs for controlling additional components.

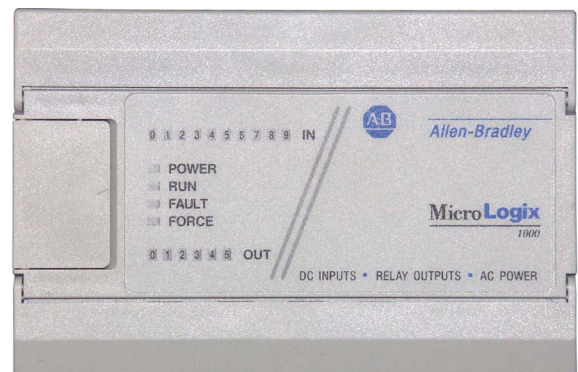
The allocation of inputs and outputs is performed in the "INPUT CONFIG." und "OUTPUT CONFIG." menus.



SPS

The SPS is used when the boiler is fed by a pellet suction discharge unit.

- Follow the additional instructions and information in the operating instructions in the pellet suction discharge unit!



Terminal plan:

Brown	suction turbine +24V (opt.)
Blue	suction turbine 0V (opt.)
Brown	MAX sensor + 24V
Blue	MAX sensor 0V
White	MAX sensor signal
Brown	MAX sensor + 24V
Blue	MAX sensor 0V
Black	MIN sensor signal
Brown	jam sensor + 24V
Blue	jam sensor 0V
Black	jam sensor signal
S1	end stop open + 24V
S3	end stop open IN
S4	end stop closed + 24V
S6	end stop closed IN

Black	- flap motor
White	- flap motor
Red	- flap motor
Brown	suction turbine 230V
Blue	Suction turbine N
Ye/gr	earth PE
Brown	suction turbine 230V
Blue	Suction turbine N
Ye/gr	earth PE

7.3 Connection instructions



DANGER

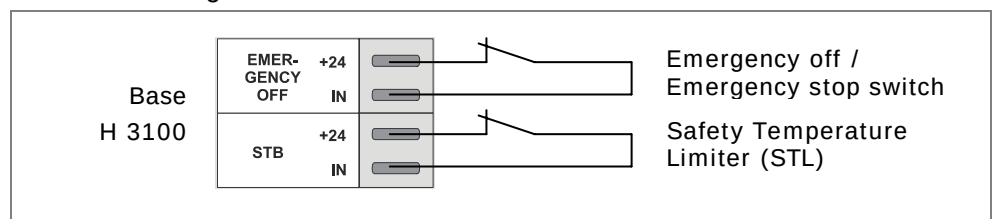
Working on electrical components.

Serious injuries from electric shocks!

- ☐ Work on electrical components should only be carried out by authorised technicians!

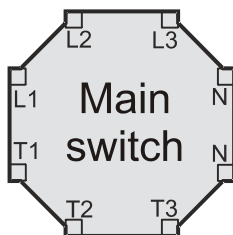
7.3.1 Connecting the safety devices

Connection diagram:



- ☐ Emergency off, emergency stop or automatic emergency off switch devices must have an opener design and be connected in series to the EMERGENCY OFF plug of the base.
-  **IMPORTANT Do not connect the emergency off or emergency stop switch to the 220V power supply of the boiler!**

7.3.2 Mains connection / Main switch



- ☐ Connect the phases of the power line to terminals T1, T2 and T3
- ☐ Connect the neutral line to the terminal N
- ☐ Connect the PE wire to the earthing rail
-  The power line should be flexible sheathed cable 5 x 2.5 mm² fitted with a 20 A fuse at the place of installation.

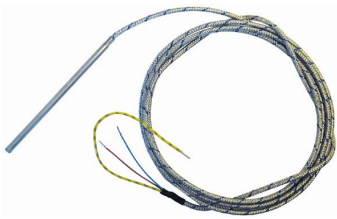
7.3.3 Heating circuit pumps for underfloor or wall heating



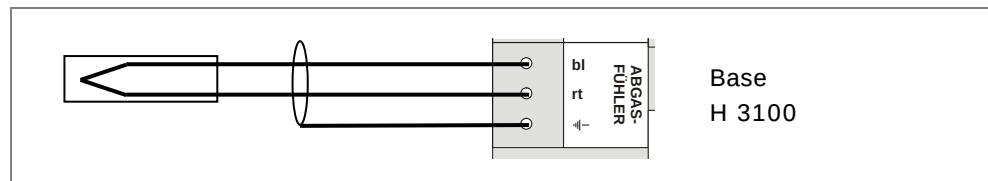
In addition to the temperature limit by the controls, the following is required for safety reasons:

A **flow contact thermostat** must also be connected upstream of the respective heating circuit pump.

7.3.4 Flue gas sensor



Connection diagram:



7.3.5 Remote control



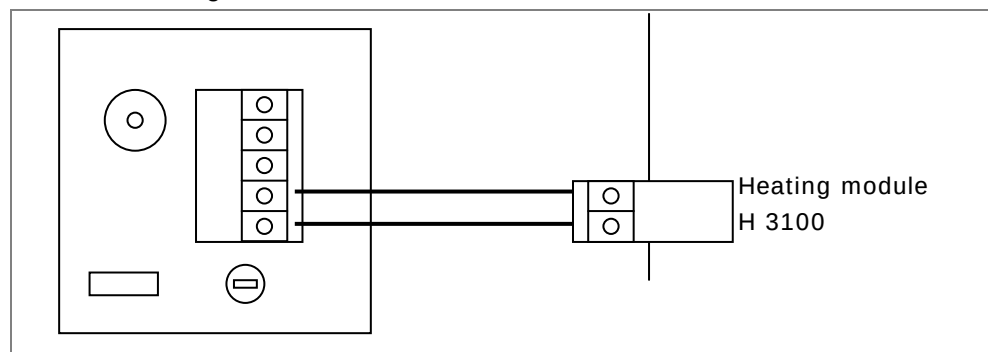
Remote control with integrated chamber sensor, which communicates the current room temperature.

☞ Maximum cable length: 40m

Switch settings:

- * ... **Override circuit:** Drawdown mode is ignored
- ⌚ ... **Automatic:** Heating/ drawdown operation according to heating times
- ⌋ ... **Drawdown mode:** Heating mode is ignored
- Handwheel ... allows you to adjust the temperature by $\pm 3^{\circ}\text{C}$

Connection diagram:

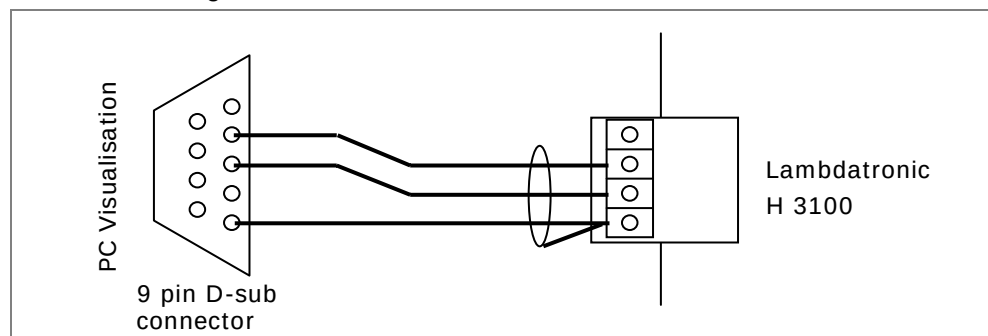


7.3.6 PC Visualisation

The system is connected to the PC via a serial interface.

☞ Maximum cable length: 15 m

Connection diagram:



7.4 Initial startup

NOTE

Initial startup should be carried out with an authorised installer or with Fröling customer services.

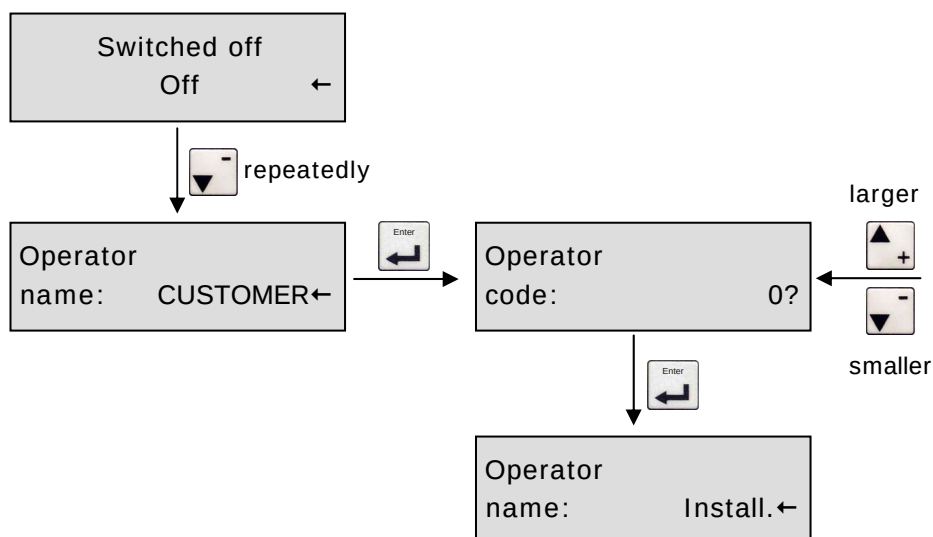
7.4.1 Switching on the system



After the boiler has been switched on at the main switch, the controls carry out a system check and show the standard readout on the display with mode and operating status.

7.4.2 Changing operating level

The individual parameters are only visible at certain 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 basic readout is displayed. It is not possible to change parameters at this level.

Customer (Code 1)

Standard level in normal operation of controls. All customer-specific parameters can be displayed and altered. The parameters available to the customer are shown in Chapter 4 "Lambdatronic H 3100 console".

Installer / Service

Releases parameters to adjust controls to the system components. All the parameters shown in this chapter are available.

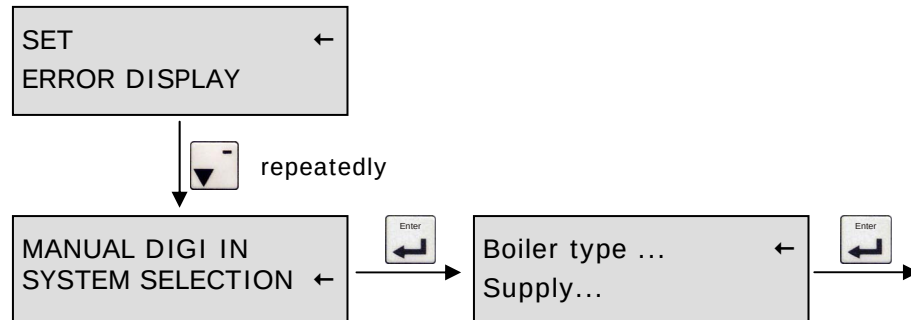
☞ Installer and service level is reset to customer level after 10 min. of inactivity (no keys are pressed).

⚠ IMPORTANT

Untrained operators may enter incorrect settings!

Incorrectly set parameters at “Installer” and “Service” level can cause serious problems with boiler functioning!

7.4.3 Setting system type

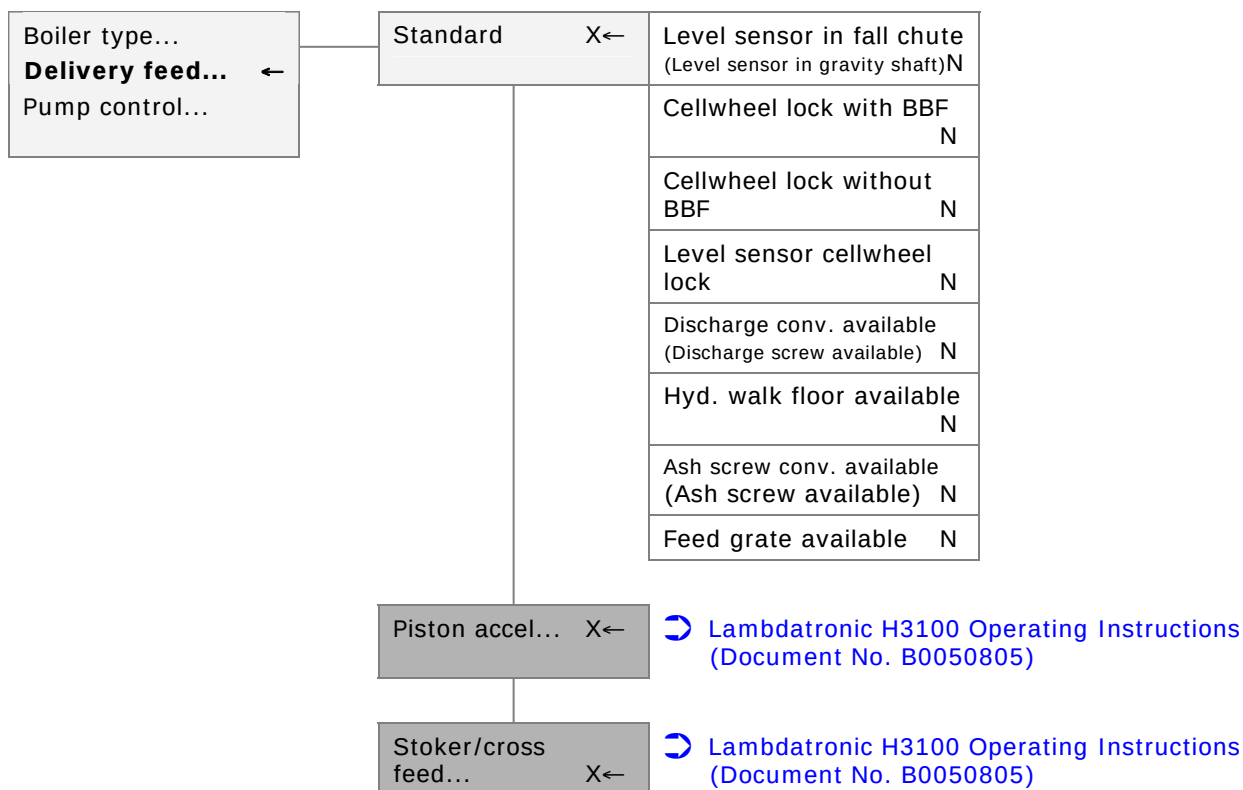


Boiler types and parameters

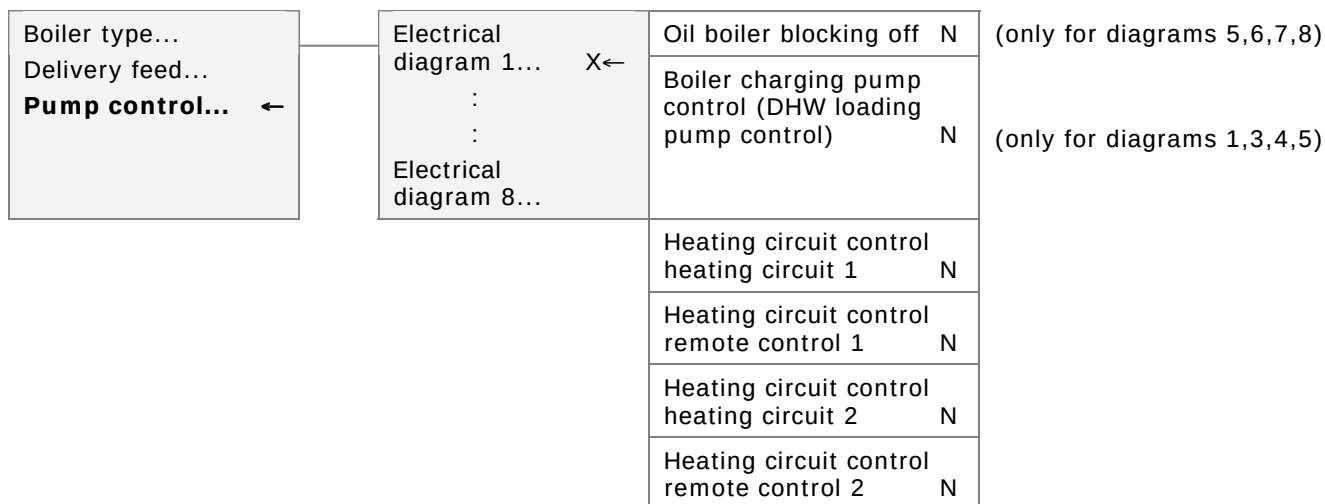
Boiler type... ← Delivery feed... Pump control...	Lambdamatic	Unimatic	Lambdamat	Turbomatic	Turbomatic 110	Boiler parameters	
	x	x	x			Vibrator motor available	N
	x	x	x			Ignition available	N
	x	x		x	x	Lambda probe in exh. gas pipe	Y
	x	x		x	x	Lambda without actuator motor	N
	x	x	x		x	Comb. chamb.temp sensor avail.	N
	x	x		x	x	Comb. chamber pres.available	N
			x	x	x	Depr. measure. available	N
			x		x	Flue Gas Cleaning available	N
	x	x	x	x	x	Boiler enable input	N
	x	x				Ind. draught FC available	N
				x	x	Induced draught controller	N
	x	x				Comb. air fan available	N
	x	x				Tipping grate available	N
				x	x	Safety ignition	N
				x	x	Shaker at shutdown	N

Do not address boiler types

Feed system and parameters



Hydraulic system and parameters



7.4.4 Check before heating up for the first time

Heating system

- ☐ Check that there is sufficient water in the heating system.
➤ [Page 43, Checking the system pressure](#)
- ☐ Check that the heating system is completely vented
- ☐ Check if the relevant safety devices are available and working correctly
➤ [Page 18, 2.4 Safety Devices](#)
- ☐ Check that there is sufficient air supply and venting
➤ [Page 15, 2.3.3 Ventilation of boiler room](#)

Drives

- ☐ Check that drives and servomotors are working
- ☐ Check the operating speed of the induced draught fan when the insulating door is closed
 - must operate between 35 - 40%
 - Adjust using the "MIN Speed" parameter
- ☐ Check that the door contact switch is working correctly
 - When the insulating door is open the induced draught fan runs at 100% speed.

Sensors

- ☐ Check that the sensors and limit switch are working in the digital input menu

7.4.5 Feeding fuel into the combustion chamber

Before the initial setup there is no fuel in the stoker and discharge screw. The parameter "Man. fuelling in com. chamb." in the "Manual operation" menu fuel is fed into the chamber.

Man. fuelling in
com. chamb. OFF←

When the first pieces of material fall into the gravity shaft, set the "Man. fuelling in com. chamb." parameter back to "OFF".

7.4.6 Setting parameters

After starting the boiler with the  key, "Winter operation" mode is set according to factory settings.

➤ For other modes see 4.2.1 Modes

You need to check and if necessary adjust the following parameter:

Heating curve	Radiator or floor heating
Minimum flue gas temperature	The value should be adjusted for chimneys without tiles or a stainless steel pipe.
Mode	➤ See 4.2.1 Modes

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 adjusted as desired by the customer:

- Target boiler temperature
- Storage times
- DHW tank times
- Boiler times (for transitional operation)
- Heating programs
- Heating circuits 1 - 2
- Start of automatic filling (for suction systems)
- Shaking times
- Cleaning times

7.5 Parameter list - Lambdatronic H 3100

7.5.1 Menu overview

Pressing the  key once takes you from the basic readout to the first menu level, where the following menu items can be selected:

SETTING DATA ...	➤ 7.5.2, Settings menu
MANUAL OPERATION ...	➤ 7.5.3, Manual operation menu
TEST OPERATION ...	➤ 7.5.4, Test operation menu
ERROR DISPLAY ...	➤ 7.5.5, Error display menu
ERROR BUFFER ...	➤ 7.5.6, Error buffer menu
MANUAL DIGI. OUT ...	➤ 7.5.7, Manual digital menu outputs
MANUAL ANAL. OUT ...	➤ 7.5.8, Manual analogue menu outputs
MANUAL DIGI. IN ...	➤ 7.5.9, Manual digital menu inputs
SYSTEM SELECTION ...	➤ 7.4.3, Setting system type
INPUT CONFIG. ...	➤ 7.5.10, Menu input configuration
OUTPUT CONFIG. ...	➤ 7.5.11, Menu output configuration

Parameters can be accessed by the CUSTOMER (without code).

Parameters are only visible at the INSTALLER level (with code).

Parameters in bold are for SERVICE TECHNICIANS (with code),



IMPORTANT

Untrained operators may enter incorrect settings!

Incorrectly set parameters at “Installer” and “Service” level can cause serious problems with boiler functioning!

7.5.2 Settings menu

Boiler temp. ...	<i>Start of pumps above</i> 65°	The pumps are released at this boiler temperature (Hysteresis 2°C).
	Shutdown above set temp. + 5°	If the boiler temperature exceeds the temperature set on the temperature selector by this value, the boiler goes to "Standby" status. If the parameter "Boiler OFF if not required" is set to "Y", the boiler switches to "Off" status. Below the boiler set temperature the boiler starts again.
	Max. boiler temp adjust value 90°	Determine the setting range of the temperature selector (70 - 90)
	Forced shutdown above max. + 3°	If the temperature exceed the specified maximum boiler temperature (parameter "Max. boiler temp adjust value") by this value, the boiler switches to "Off" status. To cool down the boiler, the pumps of the heat consumers are also activated.
	<i>Temp.diff.Boiler - heating</i> 0°	The boiler temperature must exceed the calculated flow temperature set value by this value.
	<i>Warning below boiler temp.</i> 5°	If the boiler temperature is below this value for a specified time a warning is shown on the display.
	<i>Warning delay boiler temp.</i> 30m	Delay time for parameter, "Warning below boiler temp.". Specifies how long the delay is before the warning is displayed.
	Minimum temp. return circ. 65°	If the return feed temperature falls below this value, the return feed lift pump is activated, provided that the conditions for activation have been fulfilled (see parameter, "The pumps run from"). If the value is exceeded by 2°, the pump switches off.
	<i>Min.speed bypass pump4</i>	Adjusts the minimum speed to the relevant pump type.
	<i>Bypass mix.Valve Ty240s</i>	Mixer runtime for return feed lift with mixer (runtime depends on mixer type)
	<i>Switch on delay oil boiler</i> 60m	If the temperature falls below the set boiler temperature by 5°C the burner relay is released after this time period has passed, provided that the parameter, "Burner blocking off" is set to "Y". In storage mode the burner relay only comes on when the storage tank has cooled down.
	<i>Min. operat.time oil boiler</i> 5m	Minimum runtime of oil boiler (off delay of burner relay)

Boiler setting (DHW settings) ...	Set DHW temperature 55°	When the specified temperature is reached in the DHW tank, the DHW tank loading pump switches off.
	Recharge tank min. temp. (Reload DHW tank min temp.) 45°	Reloading of the DHW tank is authorised when the DHW tank temperature is below this level.
	Start of the 1st loading process	Start of authorisation for 1st DHW tank loading session
	End of first loading process	End of authorisation for 1st DHW tank loading session
	Start of 2nd loading process	Start of authorisation for 2nd DHW tank loading session
	End of 2nd loading process	End of authorisation for 2nd DHW tank loading session
	Boiler is master (DHW priority) NO	YES = the DHW is loaded before the store
	Heat only once / day N	YES stops repeated heating in one day.
	Legionella heating 65° Y	The DHW tank is heated to at least 65°C once a week.
	Legionella heat up day Sa	Day of the week for Legionella heating.
	Charge on boiler temp. diff. 6°	Initial value of DHW loading. The boiler temperature must be higher than the DHW tank temperature by this value so that the DHW tank loading process begins.
	Storage-DHW temp diff 6°	When the top storage tank temperature is above the DHW tank temperature by this value, the DHW tank pump is released.
	Charge temp. too high 10°	If the boiler set temperature is not higher than the set DHW temperature by this value, the boiler set temperature is increased for the duration of DHW loading.
	Boiler pump min. rpm (DHW pump min rpm) 45	Adjusts the minimum speed to the pump type. Note: always set the pump to the highest power level. Only operate the pump power switch when the appliance is switched off. Caution: Pump must run at this speed! Carry out function test.

Buffer setting ...	Heating on at buffer over 30°	This is the minimum value for launching the heating circuit in combination with a storage tank. (applies to sensor 1 in conjunction with storage tank)
	Store up. min. temp. 65°	Below this temperature the upper store must drop, so that the boiler can be started within the store loading times (in transitional operation).
	Storage low = boiler temp - 10°	The storage is considered to be loaded when the "Storage lo. temperature" has reached the boiler temperature minus the set value. → The boiler switches to "Off".
	Storage pump min. rpm 4	Adjusts the minimum speed to the pump type. Note: always set the pump to the highest power level.

Heating circuit 1...	Heating curve	...	Flow temp. At external -10°C	35°	You can adjust the heating curve to the relevant system in these two work points.	
Only in conjunction with heating circuit control.			Flow temp. At external +10 °C	25°		
Weekly program			...	Mo Tu We Th Fr Sa Su 1 1 3 1 1 2 5	For heating circuit 1, heating time programs 1-7 are assigned to the days of the week.	
Heating prog.			...	Heating prog.1	...	Heating phase 1 start 06:00
						Heating phase 1 end 22:00
						Heating phase 2 start
						Heating phase 2 end
				Heating prog.2	...	You can program up to 7 heating programs each with two heating phases. Lowered outside of heating phases. In the “Weekly program” parameter these are assigned to individual days of the week.
				:	:	
				:	:	
				:	:	
				Heating prog.7	...	
Room temp. set value			20°		Target room temperature value during the heating phase → only with remote control	
Room temp.SV reduced amount			16°		Target room temperature value during the drawdown phase → only with remote control	
Room temp. cont. factor (Kp)			2.0		Influencing factor of room temp. on flow temp. If the room temp. deviates by ±1°C or more, the target value for the flow temperature resulting from the set heating curve is corrected by this value. (only with remote control)	
Flow temperature reduction			7°		The flow temperature is reduced by this value in drawdown phase.	
Ex. temp. heating limit			20°		If the external temperature exceeds this heating limit during the heating phase, the heating circuit pump and mixer are switched off.	
Outside temp. Heating limit Drawdown mode			5°		If the outside temperature exceeds this heating limit during the drawdown phase, the heating circuit pump and mixer are switched off.	
Flow temperature max. value			45°		Maximum temperature for limiting flow temperature. (system dependent: floor heating, radiators,..)	
Mixer Ty			240s		Set mixer runtime of heating circuit mixer in use! Note: do not set mixer time under 150s!	
Frost prot.temp. (inside)			10°		If the room temperature or the outfeed temperature is lower than the set value, the heating circuit pump will be switched on.	

Heating circuit 2...	Programming as in heating circuit 1
-----------------------------	-------------------------------------

Flue gas temp. ...	<i>Exhaust temp. min. value</i>	140°	Minimum target value for the flue gas temperature. Lowest load point for continuous operation (if this temperature is not reached, the output or loading rate will be increased).
	<i>Exhaust temp. max. value</i>	250°	Minimum target value for the flue gas temperature. Top load point to ensure adequate efficiency (if this temperature is exceeded, the output or loading rate will be reduced).
	<i>Temp. difference exh.-boiler</i>	15°	In "Heating" status: if the difference between flue gas temperature and boiler temperature falls below this specified value, when the safety time has elapsed, the controls go to "Fault" status → "Safety time expired". At "Ignition" status: if the difference with the "Ignition time max" is not greater than 1.5 times the value, the boiler goes to "fault" status → "Ignition attempt unsuccessful!"
	Safety time	15m	If during "Heating" status the shutdown conditions (Boiler-flue gas temp.dif. or Shutdown excess O2) for this period are not met, the boiler goes to "Insufficient safety time elapsed" or "Safety time O2 too high".

Conveyor times (Screw times) ...	Maximum loading rate		Maximum loading rate relative to possible total feed time of a cycle. Example: Max. loading rate = 17%, calculated loading rate from controls = 50%, Cycle time: 5s; -> $0.17 \times 0.5 = 0.085$ The feed screw is switched on 8.5% of the max. cycle time The rest is pause time.
	Minimum loading rate	25 %	Minimum loading rate for minimum output
	Max.Loading rate rel. n.corr.	67 %	For Lambda control without actuator: Maximum loading rate without correction from the Lambda controls, relative to the parameter, "Maximum loading rate"
	Min.Loading rate rel. n.corr.	20 %	For Lambda control without actuator: Maximum loading rate without correction from the Lambda controls, relative to the parameter, "Minimum loading rate"
	Minimum power rate	25 %	For Lambda control with actuator: Minimum fuel output (fuel quantity) based on 100% loading (parameter "Maximum loading rate") and 100% primary air (parameter "Output at 100% prim. air").
	Loading time glow keeping	1s	Continuous runtime of the feed screw for a burn maintaining cycle (The stoker screw is activated for this time and the stoker emptying time)
	Interval time glow keeping	480m	When this time has passed, a burn maintaining cycle is started in the constant burn.
	<i>Pre-running time filler screw</i>	2.0s	Only for systems without level sensors in the gravity shaft
	Evacuation time filler screw (Stoker screw evacuation time)	100s	Specifies how long the stoker screw remains on in "Stoker empty" status (back-fire flap closed and feed screw off). Parameter must be adjusted to the length of the stoker screw.
	Delivery time feeder screw	5.0s	Fixed loading time, variable interval time

Overflow time feeder screw	180s	For systems with level sensor in gravity shaft: If the level sensor does not detect any material within this time, the error message, "Fall chute empty (level sensor)" (Gravity shaft empty (level sensor!)), is displayed.
Empty time limit fire separ.	180s	For systems with level sensor in gravity shaft: If the level sensor still detects material after this time, the error message, "Fall chute empty (level sensor)" (Gravity shaft empty (level sensor!)), is displayed.
Level discharge screw over-time	300s	Runtime monitoring of the discharge screw or the discharge unit
ON delay level fire separ.	2.0s	Specifies how long the level sensor must continuously sense material in order to come on.
OFFdelay level fire separ. (Gravity shaft level OFF delay)	2.0s	If the level sensor does not sense any material within this time period, it switches off.
Post-running. time rotary valve	3s	Specifies how long the rotary valve remains on after the feed screw has stopped.
ON delay level rotary valve	2.0s	Specifies how long the level sensor above the rotary valve (over-filling safety device) must continuously sense material in order to come on.
OFF delay level rotary valve	2.0s	If the level sensor above the rotary valve (over-filling safety device) does not sense any material within this time period, it switches off.
ON delay level extract. screw	2.0s	Specifies how long the level sensor between the discharge screw and the feed screw (if present) must continuously detect material to come on.
OFF delay level extract.screw	2.0s	If the level sensor between the discharge screw and the feed screw does not sense any material within this time period, it switches off.
Cycle time ash screw	1000s	Specifies how long the feed screw must be on in total for the ash screw cycle to start.
Ash screw feed time	30s	Runtime of the ash screw in the ash screw cycle.

Shaker motor ...	<i>Shaking cycles per cleaning</i>	<i>250</i>	Specifies how many shaking cycles are carried out per cleaning.
	<i>How often should I switch off to clean</i>	<i>1</i>	Specifies how often the boiler must switch off to start automatic cleaning.
	<i>How long should I vibrate</i>	<i>2s</i>	Shaker duration in a shaking cycle.
	<i>After what charge time (After what loading time)</i>	<i>45s</i>	Specifies how long the stoker screw must be on in total for the shaking cycle to start.
	<i>I can start at</i>		Heat exchanger operation is only authorised within this time window.
	<i>I must stop at</i>		
	<i>Cleaning at</i>		Time for desired cleaning
	<i>WOS Runtime (Heat exchanger runtime)</i>	<i>4s</i>	Runtime of the heat exchanger drive in a heat exchanger cycle
	<i>Heat exchanger cycle time</i>	<i>800s</i>	Specifies how long the stoker screw must be on in total for the heat exchanger cycle to start.

Ignition ...	<i>Charge time without ign.</i>	80s	→ Boiler at "Heating status": Runtime of stoker screw After this time has elapsed, the boiler switches to "pre-heating" status
	<i>Ignition on without del.</i>	110s	→ Boiler at "Pre-heating status": Duration of pre-heating phase. No fuel is fed in.
	Maximum ign. duration	15m	The boiler changes from "Ignition" status to "Heating" status within the "Ignition time max" if the flue gas temperature has reached the required value ("Min. boiler-flue gas temp. dif." parameter). Otherwise the boiler switches to "Fault" status Error message: "Ignition attempt unsuccessful".
	Safety ignition off above	140°	
	Feed during ignition	65 %	
	Troubleshooting active	Y	

Lambda values ...	<i>Residual oxygen content</i>	9,0%	Target value for residual oxygen content.
	<i>No charge under: O2 (No loading under: O2)</i>	5,0%	Below this residual oxygen content fuel feed is stopped.
	Maximum charge correction (Maximum loading correction)	0,2	Factor for automatic adjustment of controls behaviour to the fuel.
	<i>Combustion off over: O2</i>	19,5%	If the residual O2 content goes over this value at "Heating" status, the boiler will go into "Fault" status once the safety time lapses. Error message: "Safety time expired!"
	Oxygensensor pre-heating (Lambda probe pre-heating time)	90s	Specifies how long the lambda probe is heated to reach operating temperature.

Comb. ch. temp. ...	<i>Min. combustion room temp. (Min. comb. chamb. temp.)</i>	600°	With combustion chamber temperature controls + Lambda controls: If the temperature falls below this value, the controls increase the minimum fuel output.
	<i>Max. combustion room temp.</i>	800°	With combustion chamber temperature controls + Lambda controls: If the temperature rises above this value, the controls increase the secondary air.
	<i>Minimum set value</i>	600°	Specifies the target value for the combustion chamber temperature at minimum power rate.
	<i>Maximum set value</i>	700°	Specifies the target value for the combustion chamber temperature at maximum power rate.
	No charge over (No loading over)	900°	If the temperature exceeds the specified combustion chamber temperature, safety shutdown of the feed occurs automatically.

Combustion air (Air settings) ...	100 % power at ex gas temp.	110°	Specifies from which flue gas temperature 100% fuel output may be reached. There is an output reduction factor when there are chimney draught problems.
	Power at 20ø ex. gas temp.	40 %	Lower point of the output start ramp
	Prim. air time delay	30s	Time delay of the primary air flap following loading rate change.
	Prim. air boost at starting	2.5V	Increase in primary air in the transition to "Heating" status.
	Prim. air boost duration	120s	Duration of the primary air increase in the transition to "Heating" status.
	Output at 0 % prim. air	1.8V	Adjustment to various types of actuator. Do not change factory settings
	<i>Output at 100% prim. air</i>	<i>6.0V</i>	This is used to adjust the maximum primary air for strong variations from average quality in the fuel used.
	Output at 0 % sec. air	1.8V	Adjustment to various types of actuator. Do not change factory settings
	Output at 100 % sec. air	7.0V	Adjustment to various types of actuator. Do not change factory settings
	<i>Comb. air blower delay time</i>	<i>60s</i>	Specifies the blower delay time before "Off" status at 100% loading rate. The actual delay time depends on the actual loading rate and the O2 value.
	<i>Blower post-running until exh. gas temp.</i>	<i>90°</i>	
	<i>Prim. boost at shutdown</i>	<i>5.0V</i>	
	<i>Comb. air blower delay time</i>	<i>1800s</i>	Specifies the maximum blower delay time before "Off" status.
	Min. rpm blower comb. cham.	50 %	With combustion chamber temperature controls: Specifies the minimum speed of the combustion air blower fan for output reduction.
	Min. rpm blower lambda cont.	85 %	For Lambda controls: Specifies the minimum speed of the combustion air blower fan for 0% fuel output.
	<i>Comb. chamber depres. SV</i>	<i>40Pa</i>	For the Turbomatic combustion chamber under-pressure control: Specifies the set value of the combustion chamber under-pressure and controls the speed of the ID fan appropriately.
	Min. rpm ind. draught	35 %	Adjustment to ID fan in use. Do not change factory settings
	ID fan operating time	15s	The combustion air blower fan is delayed by this parameter to the ID fan.
	<i>Blower MAX firewood oper.</i>	<i>60%</i>	Specifies the maximum speed of the combustion air blower fan in emergency firewood operation.

Boiler times ... Only effective in transitional operation!	Start of the 1st heating phase	05:00	For systems without storage tank in transitional operation: The boiler is activated within these time windows. IMPORTANT: DHW tank loading times must be within the time window of the boiler times.
	End of first heating phase	08:00	
	Start of the 2nd heating phase	17:00	
	End of the 2nd heating phase	21:00	
	Start of buffer charging	05:00	For systems with storage tank in summer and transitional operation: The boiler is switched on if the temperature falls below the "Store up. min. temp." during these time windows.
	End of buffer charging	22:00	

Mode Winter operation	You can select from: Winter operation Summer operation Transitional operation Firewood operation (EMERGENCY OPERATION)
--	--

Set day	Set the current date.
Set time	Set the current time.
Reset to basic data (Restore factory settings) N	Restores the default settings on the control. It takes a few seconds for the factory settings to be restored.

7.5.3 Manual operation menu

Manual operation is only used for manual fuel loading into the chamber and for manual ignition of the fuel.

MANUAL OPERATION ...	Man. fuelling in com. chamb.	OFF	⚠ IMPORTANT Danger of overfilling and flash-fires!
	Ignition alone switch on	OFF	

7.5.4 Test operation menu

This menu is for operating individual units for testing and for troubleshooting.

TEST OPERATION...	Start cleaning	OFF
	Feed screw forward/back	OFF
	Stoker conv. forward/back (Stoker screw forward/back)	OFF
	BBF get open	OFF
	Cellwheel lock forward/back	OFF
	Dischar. conv. forward/back (Dischar. screw forward/back)	OFF
	Ash conv. forward/back (Ash screw forward/back)	OFF
	Heat-exchanger drive	OFF
	Tipping drive	OFF

7.5.5 Error display menu

To display the error messages currently occurring.

➤ Possible error messages see page 52, 6.4 Error message list

7.5.6 Error buffer menu

Up to 25 warnings/errors already eliminated and the respective times are stored here.

Warning 20/02/07 005 clr. 13:17:24	Remote control 2 error	clr ... cleared: Error no. 005 was eliminated at this time.
Warning 20/02/07 005 ack. 13:16:23		ack ... acknowledged: Error no. 005 was acknowledged at this time.
Warning 20/02/07 005 occ. 13:15:18		occ ... occurred: Error no. 005 occurred at this time.

To display the respective error text press the enter key, e.g.: "Remote control 2 faulty".

➤ Possible error messages see page 52, 6.4 Error message list

7.5.7 Manual digital menu outputs

Used to test the digital outputs and is intended only for heating engineers. The display depends on the configuration.

<i>Actuator back-burn flap</i>	<i>A 0</i>
<i>Feed screw forwards</i>	<i>A 0</i>
<i>Stoker screw forwards</i>	<i>A 0</i>
<i>Shaker motor control</i>	<i>A 0</i>
<i>Ignition fan</i>	<i>A 0</i>
<i>Heating coil of ignition</i>	<i>A 0</i>
<i>Lambda probe heating</i>	<i>A 0</i>
<i>Relays for error messages</i>	<i>A 0</i>
<i>Pump outlet</i>	<i>A 0</i>
<i>Relays for error messages</i>	<i>A 0</i>
<i>Rotary valve forwards</i>	<i>A 0</i>
<i>Rotary valve back</i>	<i>A 0</i>
<i>Discharge screw forwards</i>	<i>A 0</i>
<i>Clean induced draught fan</i>	<i>A 0</i>
<i>Combustion air blower fan</i>	<i>A 0</i>
<i>HC1 pump</i>	<i>A 0</i>
<i>HC2 pump</i>	<i>A 0</i>
<i>HC1-We OPEN</i>	<i>A 0</i>
<i>HC1-We CLOSED</i>	<i>A 0</i>
<i>HC2-We OPEN</i>	<i>A 0</i>
<i>HC2-We CLOSED</i>	<i>A 0</i>
<i>Burner relays</i>	<i>A 0</i>
<i>Operating notification</i>	<i>A 0</i>
<i>Ash screw forwards</i>	<i>A 0</i>
<i>Heat-exchanger drive</i>	<i>A 0</i>
<i>Tipping drive</i>	<i>A 0</i>

A 0 ... Automatic OFF

A 1 ... Automatic ON

A ... Automatic

0 ... Manual AUS

1 ... Manual ON

7.5.8 Manual analogue menu outputs

Used to test the analogue outputs and is intended only for heating engineers. The display depends on the configuration.

<i>Primary air actuator</i>	<i>A 0%</i>
<i>Secondary air actuator</i>	<i>A 0%</i>
<i>Combustion air blower fan</i>	<i>A 0%</i>
<i>ID fan speed</i>	<i>A 0%</i>
<i>Boiler charging pump (DHW loading pump)</i>	<i>A 0%</i>
<i>Buffer charging pump</i>	<i>A 0%</i>
<i>Return feed lift pump</i>	<i>A 0%</i>
<i>Oil boiler pump</i>	<i>A 0%</i>
<i>Boiler charging pump</i>	<i>A 0%</i>
<i>Circuit pump 1 rpm</i>	<i>A 0%</i>
<i>Circuit pump 2 rpm</i>	<i>A 0%</i>

A 0%	... Automatic OFF
A 1% - 100%	... Automatic with value ON
A	... Automatic
0%	... Manual OFF
1% - 100%	... Manual with value ON

7.5.9 Manual digital menu inputs

Used to test the digital inputs and is intended only for heating engineers. The display depends on the configuration.

<i>Back-burn flap open</i>	<i>A 0</i>
<i>Back burn flap closed</i>	<i>A 0</i>
<i>Limit switch on fall chute</i> <i>(Limit switch on gravity shaft)</i>	<i>A 0</i>
<i>STL emerg.-off switch</i>	<i>A 0</i>
<i>Motor protection screw conv.</i> <i>(Motor protection feed screw)</i>	<i>A 0</i>
<i>Motor protection stoker conv.</i> <i>(Motor protection stoker screw)</i>	<i>A 0</i>
<i>Boiler enable</i>	<i>A 0</i>
<i>Level sensor in fall chute</i> <i>(Level sensor in gravity shaft)</i>	<i>A 0</i>
<i>Comb. chamb.pres monitor</i>	<i>A 0</i>
<i>Motor protection cellwheel lock</i>	<i>A 0</i>
<i>Overcurrent cellwheel lock</i>	<i>A 0</i>
<i>Level sensor cellwheel lock</i>	<i>A 0</i>
<i>Motor protection dischar. conv.</i> <i>(Motor protection dischar. screw)</i>	<i>A 0</i>
<i>Overcurrent dischar. conv.</i> <i>(Overcurrent dischar. screw)</i>	<i>A 0</i>
<i>Level sensor dischar. conv.</i> <i>(Level sensor dischar. screw)</i>	<i>A 0</i>
<i>Combustion chamber door limit switch</i>	<i>A 0</i>

A 0 ... Automatic, input not set

A 1 ... Automatic, input set

A ... Automatic

0 ... Manual, input not set

1 ... Manual, input set

7.5.10 Menu input configuration

This is used to configure the inputs of additional digital modules

👉 Do not change factory settings!

7.5.11 Menu output configuration

This is used to configure the outputs of additional digital modules

👉 Do not change factory settings!

8 Appendix

8.1 Guarantee conditions

Our sale and delivery conditions generally apply. These conditions have been made available to customers, and customers have been made aware of them at the time of order completion.

You can also find the guarantee conditions in the enclosed guarantee certificate.

8.2 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
E-MAIL info@froeling.com
INTERNET www.froeling.com

8.3 Declaration of Conformity


FRÖLING
 HEAT FROM WOOD



EU DECLARATION OF CONFORMITY

Product: Waste-wood burner with automatic infeed

Types: Turbomatic 28, 35, 48, 55, 70, 85, 100, 110

EU Directives:

89/392/EEC	Legal Regulations for Machinery
73/23/EEC	Legal Regulations for Electrical Equipment: Low Voltage Directive
89/336/EEC	Electromagnetic Compatibility (EMC) Directive

Applied harmonized standards:

ÖNORM – EN 303-5	Boilers for Solid Fuels up to 300 kW Requirements, Testing, and Designation
ÖNORM - EN 729-2	Welding Quality Specifications

We hereby certify that the series production version of the product designated above meets the directives, guidelines and standards specified.

Grieskirchen, 04.10.2005



 Quality Assurance



 Technical Services

Fröling Heizkessel- und Behälterbau Ges.m.b.H, Industriestraße 12, A-4710 Grieskirchen
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