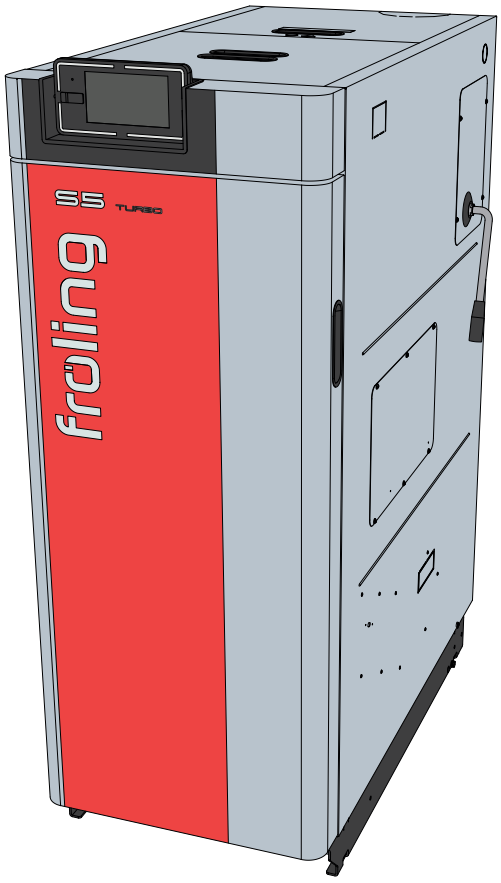
Operating instructions

Firewood boiler S5 Turbo 22-48 (ESP)

with Lambdatronic 5000



Translation of original German version of operating instructions for operators!

Read and follow all instructions and safety instructions!
Errors and omissions excepted!

CE

B1980025_en | Edition 07/01/2026

1 General 4
1.1 Operating principle 4
1.2 S5 Turbo (ESP) Product Overview 5
2 Safety 6
2.1 Hazard levels of warnings 6
2.2 Pictograms used 7
2.3 General safety information 8
2.4 Permitted uses 9
2.4.1 The Clean Air Act 1993 and Smoke Control Areas 9
2.4.2 Permitted fuels 9
2.4.3 Fuels permitted under certain conditions 11
2.4.4 Non-permitted fuels 12
2.5 Qualification of operating staff 12
2.6 Protective equipment for operating staff 12
2.7 Safety devices 13
2.8 Residual risks 14
2.9 Emergency procedure 16
2.9.1 Overheating of the system 16
2.9.2 Smell of flue gas 16
2.9.3 Power failure / induced draught fan failure 17
2.9.4 Fire in the system 17
3 Notes for operating a heating system 18
3.1 Installation and approval 18
3.2 Installation site 18
3.3 Combustion air 19
3.3.1 General requirement 19
3.3.2 Room air-independent operation 19
3.4 Domestic hot water 21
3.5 Pressure maintenance systems 23
3.6 Return lift 23
3.7 Combination with storage tank 24
3.8 Chimney connection/chimney system 24
4 Operating the system 25
4.1 Erection and initial start-up 25
4.2 Switching on the power supply 26
4.3 Before heating up the boiler 26
4.3.1 Operate the WOS lever 26
4.3.2 Check the igniter tube (for automatic ignition) 26
4.3.3 Reload quantity calculation 27
4.3.4 Determining the right amount of fuel 28
4.3.5 Reloading intervals when operating without storage tank or if the storage tank is too small 29
4.4 Filling the boiler with firewood 30
4.5 Heat up firewood manually 32
4.6 Heat up the firewood with automatic ignition 32
4.7 Reloading firewood 34
4.8 Switching off the power supply 34
4.9 Checking the ash level in the boiler 35
5 Operate the system using the touch display 36

5.1 Status display ... 38
5.2 Control icons ... 38
5.3 Basic display ... 39
5.3.1 Change information displays ... 39
5.4 Components ... 40
5.4.1 Changing the operating mode of the component ... 40
5.4.2 Change temperatures ... 41
5.4.3 Renaming a component ... 42
5.4.4 Changing times ... 43
5.5 System diagram ... 44
5.5.1 Configure system diagram ... 44
5.6 Trend lines ... 44
5.7 Maintenance & diagnostics ... 44
5.8 Settings ... 45
5.9 Connect status ... 45
5.10 USB stick ... 45
5.11 System info ... 46
5.12 User ... 46
5.12.1 Operating level with USB stick ... 46
5.12.2 Operating level with one-time password ... 46
5.13 Help menu ... 47
5.14 Setting the date and time ... 47

6 Servicing the system ... 48

6.1 General information on servicing ... 48
6.2 Required tools ... 50
6.3 Maintenance overview ... 51
6.4 Maintenance work by the operator ... 52
6.4.1 Inspection ... 52
6.4.2 Periodic inspection and cleaning ... 53
6.4.3 Maintenance of the electrostatic particle separator in the flue gas line (optional) ... 65
6.5 Maintenance work by technicians ... 66
6.5.1 Cleaning the Lambda probe ... 67
6.6 Emissions measurement by chimney sweep or regulatory body ... 68
6.6.1 General information on measurement ... 68
6.6.2 Create the measurement conditions and perform the measurement ... 69
6.7 Replacement parts ... 70
6.8 Disposal information ... 70
6.8.1 Disposal of the ash ... 70
6.8.2 Disposal of system components ... 70

7 Troubleshooting ... 71

7.1 General fault with power supply ... 71
7.1.1 Behaviour of system after a power failure ... 71
7.2 Excessive temperature ... 71
7.3 Faults with fault message ... 72
7.3.1 Procedure for fault messages ... 72

1 General

Thank you for choosing a quality product from Froling. The product features a state-of-the-art design and conforms to all currently applicable standards and testing guidelines.

Please read and observe the documentation provided and always keep it close to the system for reference. Observing the requirements and safety information in the documentation makes a significant contribution to safe, appropriate, environmentally friendly and economical operation of the system.

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

Subject to technical change.

Warranty and Guarantee Conditions

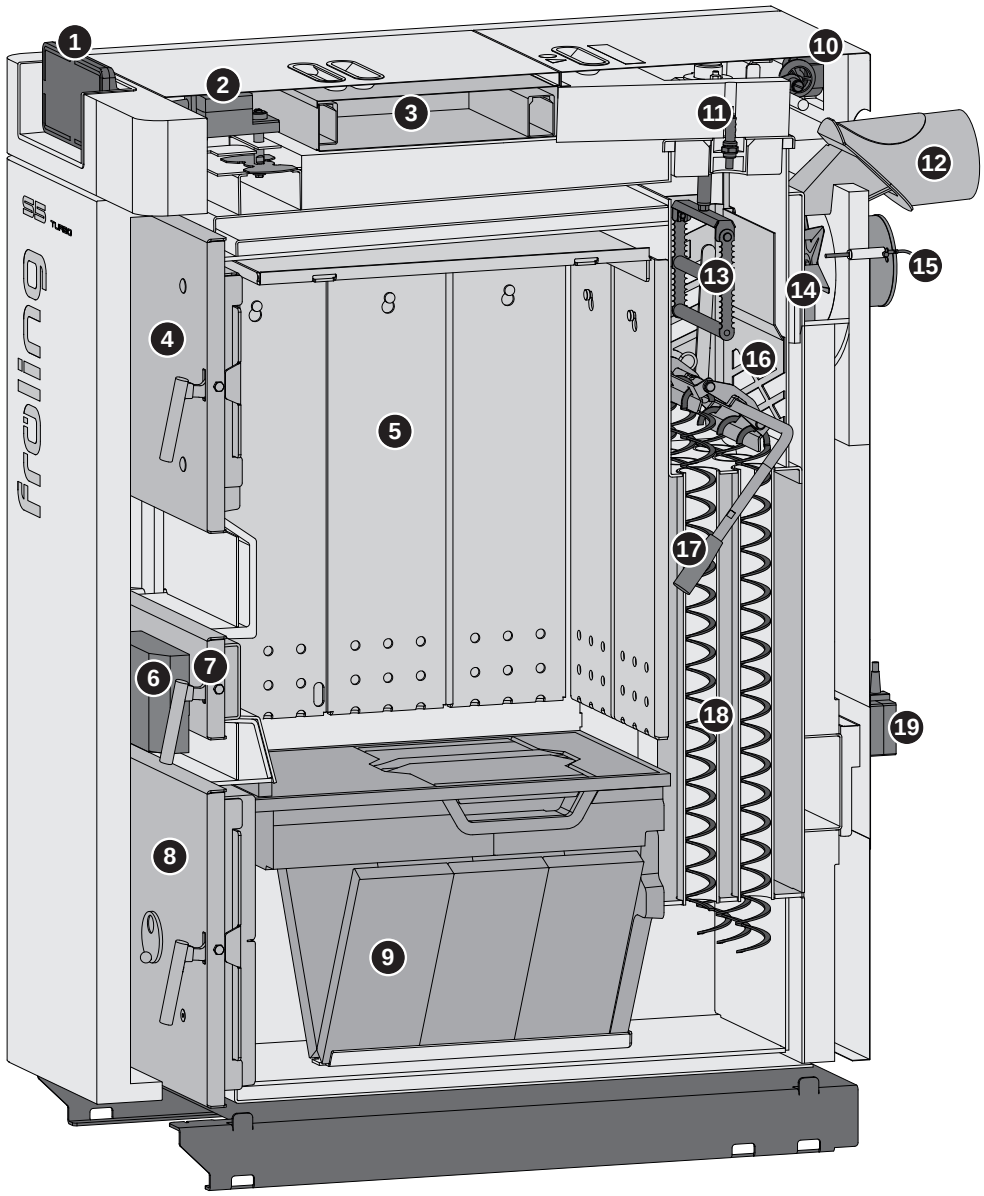
Our sale and delivery conditions will be applicable. These conditions have been made available to customers, and customers have been made aware of them at the time of order completion.

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

1.1 Operating principle

The Froling S5 Turbo (ESP) is a wood-fired boiler for non-condensing combustion of firewood. The fuel loading chamber is filled with fuel via the fuel loading door located behind the heat insulated door on the front of the boiler. The combustion grate, through which the combustion gases are sucked into the combustion chamber by the induced draught fan, is located below the fuel loading chamber. When the induced draught fan is used, the combustion air around the fuel loading door is sucked in and channelled to the fuel via regulating flaps on the air boxes (primary and secondary air). The boiler water and flue gas temperature are regulated by the induced draught fan. The primary air is used to adjust the boiler to the fuel and set the required output. The secondary air is used to set the combustion performance by way of the Lambda probe and servo-motor. The flue gas travels through the heat exchanger to the flue gas outlet. In order to optimise heat transfer and for cleaning purposes, the heat exchanger pipes are fitted with an Efficiency Optimisation System (WOS), which can be operated using a lever or activated via a drive. The ash deposits at the bottom of the combustion chamber and below the heat exchanger pipes can be removed via the combustion chamber door on the front of the boiler.

1.2 S5 Turbo (ESP) Product Overview



1	Lambdatronic 5000 control ➲ "Operate the system using the touch display" [▶ 36]	**11**	Lambda probe
2	Servo-motor for primary air	**12**	Flue gas pipe connection
3	Boiler controller Lambdatronic 5000	**13** [1)]	Electrostatic particle separator
4	Fuel loading door	**14**	Induced draught fan
5	Fuel loading chamber with combustion chamber guard	**15**	Flue gas temperature sensor
6 [1)]	Automatic ignition	**16** [1)]	Cleaning basket for electrostatic particle separator
7	Pre-heating chamber door	**17** [1)]	WOS lever
8	Combustion chamber door	**18**	Efficiency Optimisation System WOS in the heat exchanger
9	Combustion chamber	**19**	Servo-motor for secondary air
10 [1)]	Drive for the automatic WOS		

1. depending on model

2 Safety

2.1 Hazard levels of warnings

This documentation uses warnings with the following hazard levels to indicate direct hazards and important safety instructions:

⚠ DANGER

The dangerous situation is imminent and if measures are not observed it will lead to serious injury or death. You must follow the instructions!

⚠ WARNING

The dangerous situation may occur and if measures are not observed it will lead to serious injury or death. Work with extreme care.

⚠ CAUTION

The dangerous situation may occur and if measures are not observed it will lead to minor injuries.

IMPORTANT

The dangerous situation may occur and if measures are not observed it will lead to damage to property or pollution.

2.2 Pictograms used

The following symbols are used in the documentation and/or on the boiler to show what is required and forbidden and to give warnings.

In accordance with the Machinery Directive, signs fitted directly within the danger area of the boiler indicate immediate hazards or safety procedures. These stickers must not be removed or covered.

	Refer to the operating instructions		Wear safety shoes
	Wear protective gloves		Suitable protective clothing must be worn
	Wearing a mask is mandatory		Turn off the main switch
	Keep the doors closed		

	Unauthorised access prohibited		Access for persons with pacemakers or implanted defibrillators is prohibited

	Warning - hot surface		Warning - hazardous electrical voltage
	Warning - hazardous or irritant materials		Warning - automatic boiler startup
	Warning of injury to fingers or hands, automatic fan		Hand injury warning
	Warnings		Warning! Inflammable substances

2.3 General safety information

⚠ DANGER

If the device is used incorrectly:

Incorrect use of the system can cause severe injury and damage.

When operating the system:

- ❒ Observe the instructions and information in the manuals
- ❒ Observe the details on procedures for operation, maintenance and cleaning, as well as troubleshooting in the respective manuals.
- ❒ Any work above and beyond this (e.g. servicing) must be carried out by a heating engineer approved by Fröling Heizkessel- und Behälterbau GesmbH or by Froling customer services

⚠ WARNING

External influences:

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

When operating the boiler, please note the following:

- ❒ Instructions and information regarding versions and minimum values, as well as standards 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 gas 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).

Take the following precautions:

- ❒ Optimum boiler performance can only be guaranteed if the flue gas system is functioning correctly.

2.4 Permitted uses

The Froling Firewood boiler S5 Turbo / S5 Turbo ESP is designed solely for heating domestic water. Only the fuels specified in the "Permitted fuels" section may be used.

➲ "Permitted fuels" [▸ 9]

The unit should only be operated when it is in full working order. It must be operated in accordance with the instructions, observing safety precautions, and you should ensure you are aware of the potential hazards. The inspection and cleaning intervals in the operating instructions must be observed. Ensure that any faults which might impair safety are rectified immediately.

The manufacturer or supplier is not liable for any damage resulting from non-permitted uses.

Only original spare parts or specific alternative spare parts authorised by the manufacturer may be used. Any kind of change or modification made to the product will invalidate the manufacturer's conformity with the applicable guideline(s). In such cases, the product will need to undergo new hazard evaluation procedures by the operator. The operator will then be fully responsible for the declaration of conformity according to the valid guideline(s) for the product and will need to issue a corresponding declaration for the device. This person will then assume all of the rights and responsibilities of a manufacturer.

2.4.1 The Clean Air Act 1993 and Smoke Control Areas

Under the Clean Air Act local authorities may declare the whole or part of the district of the authority to be a smoke control area. It is an offence to emit smoke from a chimney of a building, from a furnance or from any fixed boiler if located in a designated smoke control area. It is also an offence to acquire an „unauthorised fuel“ for use within a smoke control area unless it is used in an „exempt“ appliance („exempted“ from the controls which generally apply in the smoke control area). The Secretary of State for Environment, Food and Rural Affairs has powers under the Act to authorise smokeless fuels or exempt appliances for use in smoke control areas in England. In Scotland and Wales this power rests with Ministers in the devolved administrations for those countries. Separate legislation, the Clean Air (Northern Ireland) Order 1981, applies in Northern Ireland. Therefore it is a requirement that fuels burnt or obtained for use in smoke control areas have been „authorised“ in Regulations and that appliances used to burn solid fuel in those areas (other than „authorised“ fuels) have been exempted by an Order made and signed by the Secretary of State or Minister in the devolved administrations.

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

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

The Froling S5 Turbo 22, S5 Turbo 22 ESP, S5 Turbo 30, S5 Turbo 30 ESP, S5 Turbo 32, S5 Turbo 32 ESP, S5 Turbo 34, S5 Turbo 34 ESP, S5 Turbo 40, S5 Turbo 40 ESP, S5 Turbo 48 and S5 Turbo 48 ESP have been recommended as suitable for use in smoke control areas when burning fuels as listed under "Permitted fuels".

2.4.2 Permitted fuels

Firewood

Firewood up to max. 55 cm long.

Water content	Water content (M) greater than 15% (equivalent to wood moisture U > 17%)

Water content (M) less than 25% (equivalent to wood moisture U < 33%)	

Note on standards

EU:	Fuel acc. to EN ISO 17225 - Part 5: Firewood class A2 / D15 L50
Germany also:	Fuel class 4 (§3 of the First Federal Emissions Protection Ordinance (BimSchV) in the last amended version)

Tips for storing wood

- Use wind-exposed areas where possible for storage (e.g. store at edge of forest instead of in forest)
- Walls of buildings facing the sun are ideal
- Create a dry underlay, where possible with air access (line with round timber, pallets, etc.)
- stack split wood and store in such a way that it is protected from the elements
- If possible, stock fuel for the day in a warm place (e.g. in boiler room) (pre-heats the fuel!)

Storage time dependent upon water content

	Wood type	Water content	
		15 – 25%	less than 15 %
Storage in heated and ventilated room (approx. 20°C)	Soft wood (e.g. spruce)	approx. 6 months	from 1 year
	Hardwood (e.g. beech)	1 – 1.5 years	from 2 years
Outdoor storage (protected from elements, exposed to wind)	Soft wood (e.g. spruce)	2 summers	from 2 years
	Hardwood (e.g. beech)	3 summers	from 3 years

Freshly cut wood has an approximate water content of 50 to 60% depending on when it was harvested. As the above table shows, the water content of the firewood decreases the longer the wood is stored depending on how dry and warm the storage location is. The ideal water content of firewood is between 15 and 25%.

If the water content falls below 15 %, the fuel is only permitted to a limited extent and the combustion control must be adapted to the fuel.

2.4.3 Fuels permitted under certain conditions

Wood briquettes

Wood briquettes for non-industrial use with a diameter of 5-10 cm and 5-50 cm long.

Note on standards

EU:	Fuel as per EN ISO 17225 - Part 3: wood briquettes class B / D100 L500 Form 1 - 3
Additional for Germany:	Fuel class 5a (§3 of the First Federal Emissions Protection Ordinance (BImSchV) - applicable version)

Notes on use

- When burning wood briquettes use the settings for extremely dry fuel
- Wood briquettes must be heated up with firewood as per EN ISO 17225-5 (at least two layers of firewood under the wood briquettes)
- The fuel loading chamber must not be filled more than 3/4 full, as the wood briquettes expand during combustion
- Even when using the settings for dry fuel, burning wood briquettes can cause combustion problems. In such cases, repairs must be carried out by qualified staff. Please contact Froling customer services or your installer.

2.4.4 Non-permitted fuels

The use of fuels other than those defined in the "Permitted fuels" section, and particularly the burning of refuse, is not permitted

IMPORTANT

In the event that non-permitted fuels are used:

Burning non-permitted fuels increases the amount of cleaning required and leads to a build-up of aggressive deposits and condensation which can damage the boiler. Consequently this invalidates the warranty! Using non-standard fuels can also lead to serious faults in combustion!

For this reason, when operating the boiler:

❒ Use only the permitted fuels

2.5 Qualification of operating staff

⚠ CAUTION

If unauthorised persons enter the Installation room / boiler room:

Risk of personal injury and damage to property

❒ The operator is responsible for keeping unauthorised persons, in particular children, away from the system.

Only trained operators are permitted to operate the unit. The operator must also have read and understood the instructions in the documentation.

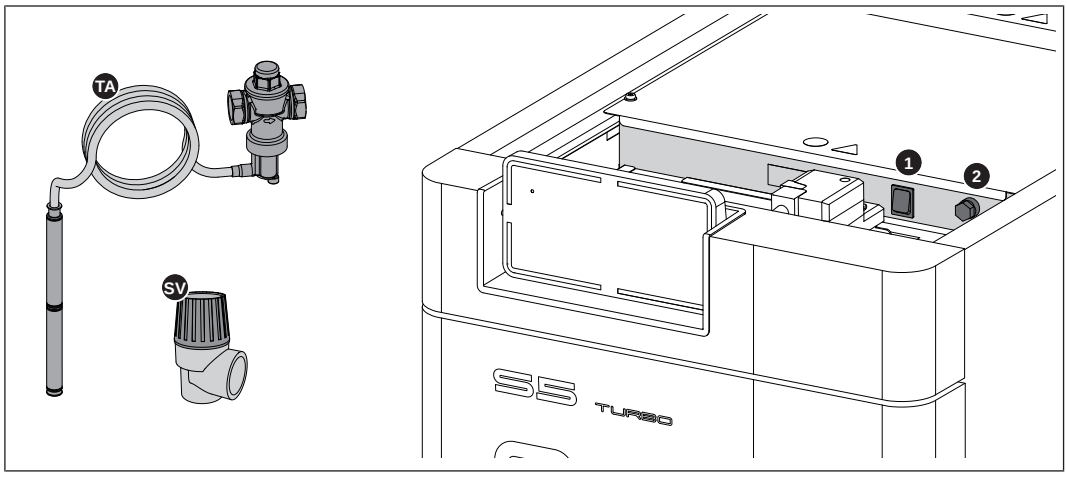
2.6 Protective equipment for operating staff

You must ensure that staff have the protective equipment specified by accident prevention regulations!

- For operation, inspection and cleaning:
  - suitable work wear
  - protective gloves
  - sturdy shoes
  - dust mask

  When working with dust from the electrostatic particle separator, use dust masks in filter class FFP2 or higher

2.7 Safety devices



TV	**THERMAL DISCHARGE VALVE** *(protection against overheating)* The thermal discharge valve opens at approx. 100°C and feeds cold water to the safety heat exchanger to lower the boiler temperature
SV	**SAFETY VALVE** *(protection against overheating/excess pressure)* When a boiler pressure of max. 3 bar is attained, the safety valve opens and vents off the hot water in the form of steam.
1	**MAIN SWITCH** *(switches off the power supply)* Before cleaning work in/on the boiler: ❒ Turn off the main switch ↳ The power to all components is switched off. ↳ **WARNING!** Only switch off the boiler when the fuel has burnt down and the boiler has cooled off.
2	**HIGH-LIMIT THERMOSTAT (STL)** *(protection against overheating)* The STL switches off the combustion system when the boiler reaches approx. 105°C. The pumps continue to run. Once the temperature falls below approx. 75°C, the STL can be reset mechanically.

2.8 Residual risks

⚠ DANGER

If maintenance work is performed when the system is in operation:

Risk to life from high voltage electrodes!

Prior to working on the electrostatic particle separator, ensure the following:

- ❒ Switch off the power supply and take precautions to prevent accidental switching on
- ❒ Earth and short circuit HV electrodes
- ❒ Always have work carried out by a qualified electrician
- ❒ Observe the applicable standards and regulations
  - ↳ Work must not be carried out on electrical components by unauthorised persons

⚠ DANGER

Persons using pacemakers whilst in the immediate vicinity of the electrostatic particle separator:

Interference of the pacemaker by electromagnetic fields of the particle separator is possible!

Therefore:

- ❒ Maintain a safety distance of at least one metre from the electrostatic particle separator
- ❒ Perform work only when the electrostatic particle separator is switched off

⚠ WARNING

When the main switch is switched off in heating mode:

The boiler is placed in an uncontrolled state. Any resulting boiler malfunctions can cause serious injury and damage.

Therefore:

- ❒ Allow the fire to burn out completely and let the boiler cool, only then switch off the main switch.
  - ↳ ID fan switches off when "Off" status has been reached (flue gas temperature < 80 °C, boiler temperature < 65 °C)

⚠ WARNING

When touching hot surfaces:

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

When work is carried out on the boiler:

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

⚠ WARNING

If you open the combustion chamber door, pre-heating door, fuel loading door during operation:

This may result in injury, damage or flue gas generation!

Take the following precautions:

- ❒ Do not open the combustion chamber door or pre-heating chamber door while the boiler is running
- ❒ Keep the fuel loading door closed during operation and only open briefly during reloading intervals
- ❒ Protective gloves must be worn for work on the boiler, and it should only be operated using the handles provided

⚠ WARNING

If non-permitted fuel types are used:

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

Take the following precautions:

- ❒ Only use fuels specified in the "Permitted fuels" section of these operating instructions.

⚠ WARNING

When inspecting and cleaning the boiler with the main switch on:

Serious injuries possible due to boiler/individual components starting up automatically (induced draught)!

Before inspection and cleaning work in/on the boiler:

- ❒ Allow the fuel in the boiler to burn off
- ❒ Allow boiler to cool off and switch off main switch

IMPORTANT

Automatic ignition set incorrectly or not carried out

Possible damage to equipment from frost, etc.

Take the following precautions:

- ❒ Check the start time that has been set for automatic ignition
- ❒ After a short time, ensure that automatic ignition has been carried out successfully
  - ↳ Due to differing fuel compositions, Froling cannot guarantee successful automatic ignition. The manufacturer/supplier is not responsible for resulting damage.

2.9 Emergency procedure

2.9.1 Overheating of the system

If the system overheats and the safety devices fail to operate, proceed as follows:

IMPORTANT! Do not under any circumstances switch off the main switch or disconnect the power supply.

- ❒ Keep all the doors on the boiler closed
- ❒ Open all mixing valve taps, switch on all pumps.
  - ↳ The Froling heating circuit control takes on this function in automatic operation.
- ❒ Leave the boiler room and close the door
- ❒ Open any thermostatic valves on the radiator and ensure sufficient heat dissipation from the rooms

If the temperature does not drop:

- ❒ Contact the installer or Froling customer services

2.9.2 Smell of flue gas

⚠ DANGER

If you smell flue gas in the boiler room:

Inhaling toxic flue gas can potentially be fatal!

If you smell flue gas in the room where the boiler is installed:

- ❒ Keep all the doors on the boiler closed
- ❒ Ventilate the room where the boiler is installed
- ❒ Close the fire door and doors to living areas
- ❒ Allow the fire to burn out completely and let the boiler cool

Recommendation: Install smoke alarms and carbon monoxide detectors near the system.

2.9.3 Power failure / induced draught fan failure

A power failure, among others, can be identified based on the following points:

- Display remains dark despite touching it
- LED status does not flash / light up
- No noise from the units (e.g. induced draught fan) can be heard

If the induced draught fan fails when there is power supply, the display shows the error message "`ID fan does not rotate, in spite of full activation`".

⚠ DANGER

In the event of a power failure or induced draught fan failure during heating mode:

The boiler is placed in an uncontrolled state. Life-threatening injury is possible when opening the doors.

What to do in the event of a power failure / induced draught fan failure:

- ❒ Keep all the doors on the boiler closed
- ❒ Ventilate the room where the boiler is installed
- ❒ Close the fire door and doors to living areas
- ❒ Allow the fire to burn out completely and let the boiler cool

Recommendation: Equip the boiler with an uninterruptible power supply (UPS). This ensures correct combustion of the firewood and prevents possible uncontrolled conditions (tarring of the heat exchanger etc.).
Please refer to section entitled "Technical specifications" in the installation instructions for the boiler on how to design an uninterruptible power supply.

Recommendation: Install smoke alarms and carbon monoxide detectors near the system.

2.9.4 Fire in the system

⚠ DANGER

In case of fire in the system:

Risk of death by fire and poisonous gases

Emergency procedure in case of fire:

- ❒ Leave the room in which the boiler is installed and close the doors
- ❒ Press the on-site EMERGENCY STOP button
- ❒ Inform the fire department

3 Notes for operating a heating system

Carrying out modifications to the system and changing or disabling safety equipment is prohibited.

Always comply with all fire, building and electrical regulations when installing or operating the system, in addition to following the operating instructions and mandatory regulations that apply in the country in which the tank is operated.

3.1 Installation and approval

The boiler should be operated in a closed heating system. The following standards govern the installation:

Note on standards

EN 12828 - Heating Systems in Buildings

IMPORTANT: Every heating system must be officially approved.

The appropriate supervisory authority (inspection agency) must always be informed when installing or modifying a heating system, and authorisation must be obtained from the building authorities:

Austria: report to the construction authorities of the community or magistrate

Germany: report new installations to an approved chimney sweep / the building authorities.

3.2 Installation site

Requirements for the load bearing substrate:

- Flat, clean and dry
- Non-combustible and with sufficient load-bearing capacity

Conditions at the installation site:

- Protecting the system against frost
- Sufficiently well lit
- Free of explosive atmospheres such as flammable substances, hydrogen halides, cleaning agents and consumables
- Installation at altitude higher than 2000 metres above sea level only after consultation with the manufacturer
- The system must be protected against gnawing and nesting by animals (such as rodents)
- No flammable materials in proximity to the system
- Observe national and regional regulations regarding the installation of smoke detectors and carbon monoxide detectors

IMPORTANT! Depending on the geographical location, increased cleaning effort in neighbouring areas (terrace, wellness area, etc.) may be necessary due to emissions from the system. In addition, the yield of facilities using solar energy may be affected. To counteract the reduced performance of such equipment, we recommend cleaning on a recurrent basis or using downstream/integrated components for flue gas treatment (e.g. cyclone separators).

3.3 Combustion air

3.3.1 General requirement

For safe operation, the boiler requires around 1.5 - 3.0 m³ of combustion air per kW nominal heat output and operating hour. The air supply can be provided by free ventilation (e.g. windows, air shaft), mechanical ventilation from outside or, if necessary, from the group of rooms.

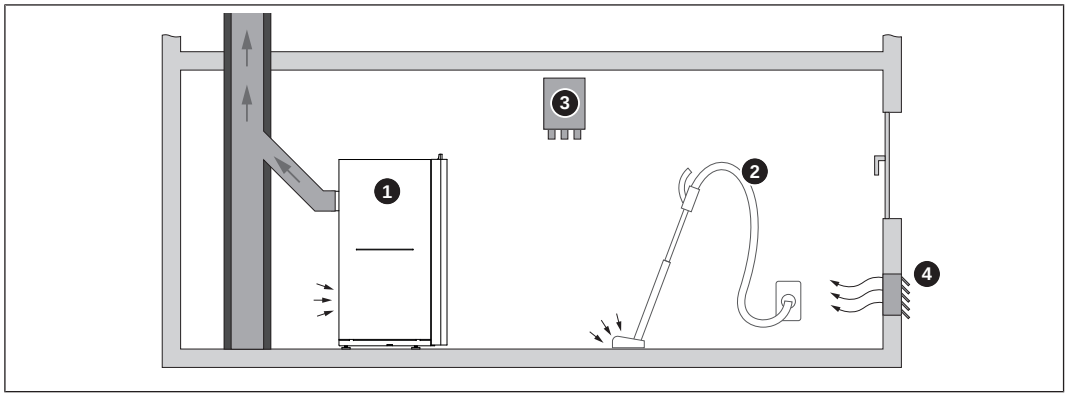
The boiler is operated depending on the room air, whereby the combustion air is taken from the installation site.

A suitable air supply must ensure that no impermissible under-pressure greater than 4 Pa is created at the installation site. The use of safety devices (under-pressure monitoring system) may be necessary, particularly if the boiler is operated concurrently with air-suction systems (such as an extractor fan).

Local **IMPORTANT! Safety equipment and conditions for the operation of the boiler (room air-dependent / room air-independent) must be clarified with the local authority (authority, chimney sweep, ...).**

3.3.2 Room air-independent operation

The combustion air is taken from the installation site. The unpressurised flow of the required air quantity must be ensured accordingly.



1	Boiler in room air-dependent operation
2	Air extraction system (such as centralised dust extraction system, room ventilation)
3	Under-pressure monitoring system
4	Combustion air supply from outside

The minimum cross-sectional area of the supply air opening from outside depends on the nominal heat output of the boiler.

Austria	400 cm² net minimum cross-sectional area plus 4 cm² for every kW of nominal heat output above 100 kW
Germany	150 cm² net minimum cross-sectional area plus an additional 2 cm² for every further kW of nominal heat output above 50 kW

Examples

Minimum free cross-section [cm²]										
Nominal heat output [kW]	**10**	**15**	**20**	**30**	**50**	**100**	**150**	**250**	**350**	**500**
Austria	400	400	400	400	400	400	600	1000	1400	2000
Germany	150	150	150	150	150	250	350	550	750	1050

Combustion air can also be supplied from other rooms if it can be proven that sufficient combustion air can flow in whilst all mechanical and natural ventilation systems are in operation. The installation site must have a minimum volume in accordance with the applicable regional standards.

Note on standards

Austria:	OIB Guideline 3 - Hygiene, health and environmental protection
Germany:	Model Firing Ordinance (MFeuV)

3.4 Domestic hot water

Unless contrary to other national regulations, the latest versions of the following standards and guidelines apply:

Austria:	ÖNORM H 5195	Switzerland:	SWKI BT 102-01
Germany:	VDI 2035	Italy:	UNI 8065

Observe the standards and also follow the recommendations below:

- ❒ Use prepared water which complies with the standards cited above for filling and make-up water
- ❒ Avoid leaks and use a closed heating system to maintain water quality during operation
- ❒ When filling with top-up water, always vent the filling hose before connecting it, in order to prevent air being drawn into the system
- ❒ Check that the heating water is clear and free of substances that can be deposited as sediments
- ❒ Check that the pH value is between 8.2 and 10.0. If the central heating water comes into contact with aluminium, the pH value must be between 8.2 and 9.0, as specified in VDI 2035
- ❒ The use of fully demineralised filling and top-up water with an electrical conductivity not exceeding 100 µS/cm is recommended by EN 14868
- ❒ After the first 6-8 weeks, check the heating water to ensure that the specified values are being adhered to
- ❒ Unless specified otherwise by regional standards and regulations, perform an annual check on the heating water

Filling and make-up water as well as heating water to VDI 2035 Sheet 1:2021-03:

Total heat output in kW	**Total earth alkalis in mol/m³ (total hardness in °dH)**		
	Specific system volume in l/kW heat output[1)]		
	≤ 20	**20 to ≤40**	**> 40**
≤ 50 specific water content heat generator ≥ 0.3 l/kW[2)]	none	≤ 3.0 (16.8)	< 0.05 (0.3)
≤ 50 specific water content heat generator < 0.3 l/kW[2)] (e.g. circulation water heater) and systems with electric heating elements	≤ 3.0 (16.8)	≤ 1.5 (8.4)	
> 50 to ≤ 200	≤ 2.0 (11.2)	≤ 1.0 (5.6)	
> 200 to ≤ 600	≤ 1.5 (8.4)	< 0.05 (0.3)	
> 600	< 0.05 (0.3)		

1. For calculating the specific system volume, the smallest individual heating capacity is to be used for systems with several heat generators.
2. In systems with several heat generators with different specific water contents, the smallest specific water content is decisive in each case.

Additional requirements for Switzerland

The filling and make-up water must be demineralised (fully purified)

- The water must not contain any ingredients that could settle and accumulate in the system
- This makes the water non-electroconductive, which prevents corrosion
- It also removes all the neutral salts such as chloride, sulphate and nitrate which can weaken corrosive materials in certain conditions

If some of the system water is lost, e.g. during repairs, the make-up water must also be demineralised. It is not enough to soften the water. The heating system must be professionally cleaned and rinsed before filling the units.

Inspection:

- After eight weeks, the pH value of the water must be between 8.2 and 10.0. If the central heating water comes into contact with aluminium, the pH value must be between 8.0 and 8.5
- Annually: values must be recorded by the owner

Advantages of heating water treated in accordance with the standards:

- Less of a drop in output due to reduced limescale build-up
- Less corrosion due to fewer aggressive substances
- Long-term cost savings thanks to improved energy efficiency

Frost protection

When operating the system with frost-protected heat transfer media, the following instructions and ÖNORM H 5195-2 must be observed:

- Antifreeze dosage according to the manufacturer's data sheet
  IMPORTANT: If the medium contains too much or too little antifreeze it becomes highly corrosive
- Adding antifreeze reduces the specific heat capacity of the medium; therefore design components (pumps, pipework, etc.) accordingly
- Add frost protection only to heat transfer medium in those areas that may be affected by frost (TIP: system separation)
- Check the antifreeze dosage regularly according to the manufacturer's instructions
- Dispose of frost-protected heat transfer medium at the end of its shelf life and refill the system

3.5 Pressure maintenance systems

Pressure maintenance systems in hot-water heating systems keep the required pressure within predefined limits and balance out volume variations caused by changes in the hot-water temperature. Two main systems are used:

Compressor-controlled pressure maintenance

In compressor-controlled pressure maintenance units, a variable air cushion in the expansion tank is responsible for volume compensation and pressure maintenance. If the pressure is too low, the compressor pumps air into the tank. If the pressure is too high, air is released by means of a solenoid valve. The systems are built solely with closed-diaphragm expansion tanks to prevent the damaging introduction of oxygen into the heating water.

Pump-controlled pressure maintenance

A pump-controlled pressure maintenance unit essentially consists of a pressure-maintenance pump, relief valve and an unpressurised receiving tank. The valve releases hot water into the receiving tank if the pressure is too high. If the pressure drops below a preset value, the pump draws water from the receiving tank and feeds it back into the heating system. Pump-controlled pressure maintenance systems with **open expansion tanks** (e.g. without a diaphragm) introduce ambient oxygen via the surface of the water, exposing the connected system components to the risk of corrosion. These systems offer no oxygen removal for the purposes of corrosion control as required by VDI 2035 and **in the interests of corrosion protection should not be used**.

3.6 Return lift

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

IMPORTANT

Risk of dropping below dew point/condensation formation if operated without return temperature control.

Condensation water forms an aggressive condensate when combined with combustion residue, leading to damage to the boiler.

Take the following precautions:

❒ Regulations stipulate the use of a return temperature control.

↳ The minimum return temperature is 60 °C. We recommend fitting some kind of control device (e.g. thermometer).

3.7 Combination with storage tank

You can find more detailed information about the storage tank design in the boiler assembly instructions.

IMPORTANT! See "Design Information" section in the assembly instructions

3.8 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. Please note in this respect that flue gas temperatures lower than 160K above room temperature can occur in the permitted operating range of the boiler.

IMPORTANT! Please see the technical data contained in the assembly instructions for further information about standards and regulations as well as the flue gas temperatures when clean and the other flue gas values!

4 Operating the system

4.1 Erection and initial start-up

Erection, installation and initial start-up of the boiler may be performed only by qualified staff; these procedures are described in the accompanying installation instructions.

IMPORTANT

Optimum efficiency and efficient, low-emission operation can only be guaranteed if the system is set up by trained professionals and the standard factory settings are observed.

Take the following precautions:

❒ Initial startup should be carried out with an authorised installer or with Froling customer services

The customer is responsible for ensuring the following prior to initial start-up of the system by Froling customer services:

- Electrical installation
- Installation of water pipes
- Connect flue gas including all insulation work
- Work must comply with local fire protection regulations
- Correct assembly / setting of the air duct according to firewood used, see boiler assembly instructions

- It is essential that the electrician who has carried out the installation work is available when starting up the system for the first time to make any changes to the wiring which may become necessary.
- During initial start-up, operating staff are shown how to use the boiler. It is imperative for proper handover of the product that those involved are present as this is a one-off opportunity.

IMPORTANT

If condensation escapes during the initial heat-up phase, this does not indicate a fault.

❒ Tip: If this occurs, clean up using a cleaning rag.

4.2 Switching on the power supply

❒ Turn on the main switch

↳ There is voltage at all of the boiler's components

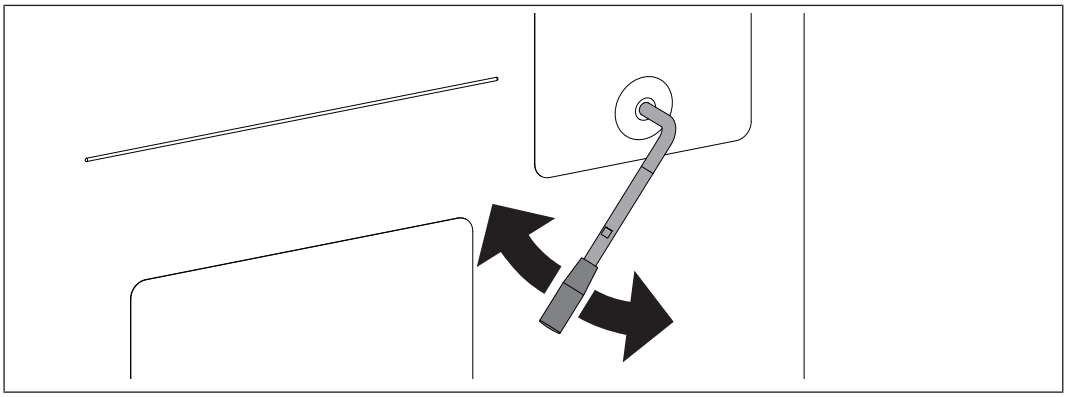
↳ When the control has completed the system start, the boiler is ready for operation

4.3 Before heating up the boiler

4.3.1 Operate the WOS lever

Automatic WOS For boilers with automatic WOS, the heat exchanger pipes are cleaned using “Cleaning” mode after each time it heats up.

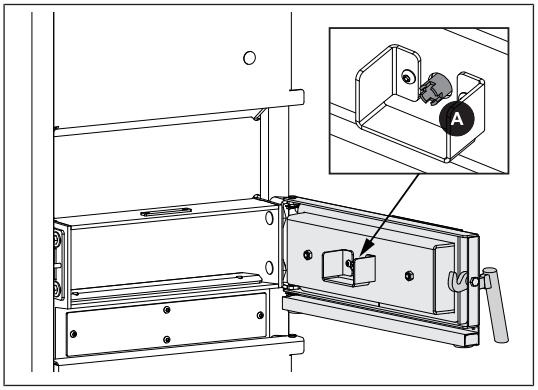
Manual WOS



❒ Move the lever of the cleaning system several times before the heating-up process (5-10 times up and down)

↳ The heat exchanger pipes are cleaned

4.3.2 Check the igniter tube (for automatic ignition)



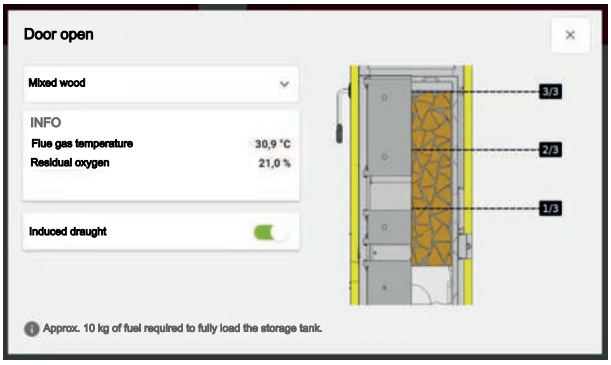
❒ Before filling the fuel loading chamber, check the igniter tube (A) of the automatic ignition for dirt and clean if necessary.

4.3.3 Reload quantity calculation

The reload quantity calculation is used to display on the control how much firewood is required to refill the boiler, based on the current storage tank fill level. It does not take into account boiler efficiency, pipe losses and the energy required to heat the boiler and heating system.

Requirements for function:

1. Four temperature sensors installed in storage tank
2. Correct storage tank size specified



When the door is opened, a dialogue with a graphic representation of the required replenishment quantity is displayed. An info text at the bottom of the display also indicates the required replenishment quantity, such as

- approx. 10 kg of fuel is required to fully load a 2000 l storage tank
- Sufficient heat available, do not heat/reload

The fuel used can be selected (softwood, mixed wood, hardwood). Changing the fuel can change the quantity of fuel required for refuelling.

4.3.4 Determining the right amount of fuel

The amount of fuel added should allow the storage tank to be constantly heated to the max. storage tank temperature (= boiler target temperature). Please note that the amount to reload also depends on the type of fuel.

Example: Heat a 2000 litre storage tank by 30°C

The calculation below only takes into account the storage tank. It does not take into account the boiler efficiency, pipe losses and the energy required to heat the boiler and heating system.

Assumption: The storage tank currently has a temperature of 50°C and should be heated to 80°C. The calculation below shows how much fuel is required for heating. First we calculate the energy required:

As the medium to be heated is water and the mass is roughly the same as the volume (2000 litres = 2000 kg), we can use the simplified formula Q = m x c x Δt.

Q = energy required
m = mass of the medium to be heated
c = heat capacity of the medium to be heated (constant for water)
Δt = temperature difference between start and end temperature[1)]

Mass (m) x heat capacity (c) x temperature difference (Δt) = energy (Q)

2000 kg x 1.163 Wh/kgK x 30 K = 69 780 Wh

69 780 Wh = **69.8 kWh**

Heating a 2,000 litre storage tank from 50°C to 80°C requires approx. 69.8 kWh of energy.

1. Temperature difference in Kelvins (K). As these are not absolute temperatures the value can be entered in degrees Celsius (°C). (30°C equals 30 K)

The amount of fuel can now be calculated from the energy required:

For our sample calculation we used beech with a water content w=20%. The energy content of the fuel varies according to the type of wood and the water content. (➲ "Fuel table" [▸ 29])

Energy required = 69.8 kWh (from calculation above)
Energy content of fuel = 3.8 kWh/kg (beech, w=20%)

Energy required / energy content of fuel = amount of fuel

69.8 kWh / 3.8 kWh/kg = **18.4 kg**

Approx. 18.4 kg beech wood (w=20%) is required to heat a 2,000 litre storage tank from 50°C to 80°C.

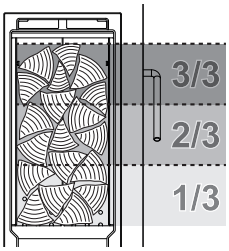
Fuel table

The table below shows a selection of wood types with the corresponding energy content depending on the water content:

Wood type	Energy content with water content [kWh/kg]		
	w = 15%	w = 20%	w = 25%
Spruce	4.3	4.0	3.7
Pine	4.3	4.0	3.7
Beech	4.1	3.8	3.5
Oak	4.1	3.8	3.5

Fill level in boiler

The table below shows the relationship between fill level and weight. It compares beech (example of hardwood) and spruce (example of soft wood) with a water content of approx. 20%. Using our example above with beech, the fill level of an S5 Turbo 30 would, therefore, be approx. one third.



Fill level		Weight at fill level
		S5 Turbo 22-30F (ESP)
3/3	Beech	approx. 45 kg
	Spruce	approx. 28 kg
2/3	Beech	approx. 30 kg
	Spruce	approx. 19 kg
1/3	Beech	approx. 15 kg
	Spruce	approx. 9 kg

4.3.5 Reloading intervals when operating without storage tank or if the storage tank is too small

IMPORTANT

Feed based on output:

Only replenish the fuel if energy is needed!

❒ If too much fuel is loaded, the boiler drops below its minimum output limit and goes over to "constant burn" operating status (blower fan switches off)

↳ The level of efficiency drops in constant burn mode, the emissions increase and the boiler can tar up (pitch formation!)

4.4 Filling the boiler with firewood

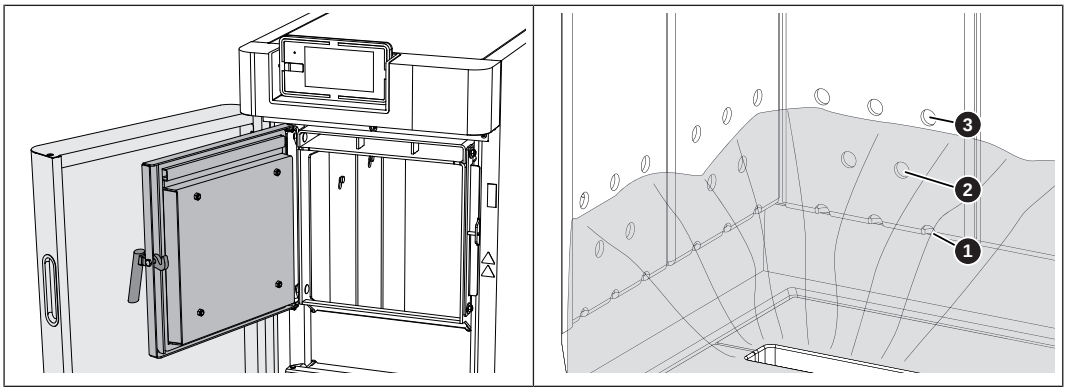
IMPORTANT

Fill fuel loading chamber for later manual / automatic ignition

Premature self-ignition of the firewood by residual heat / temperature of the combustion chamber possible

Therefore:

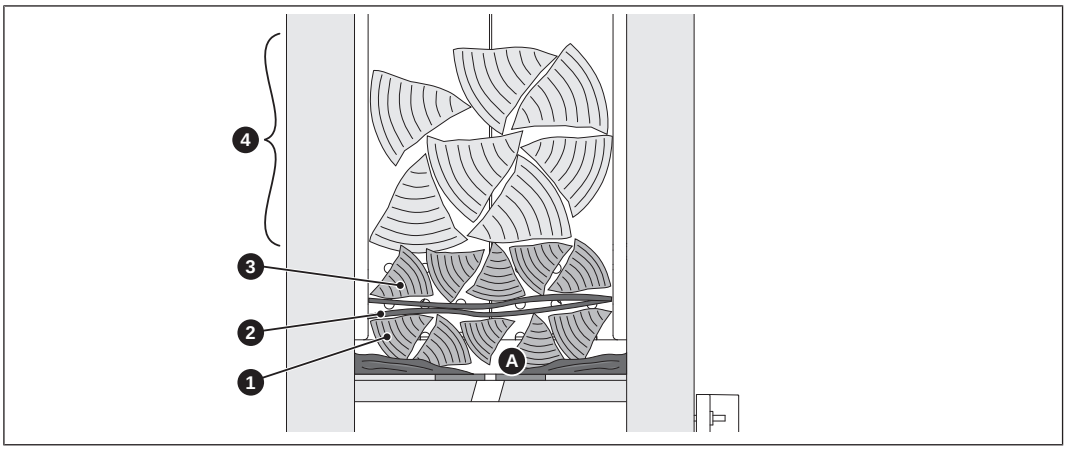
- ❒ Completely remove residual embers from the combustion chamber
- ❒ Allow the combustion chamber to cool down
- ❒ An ash layer up to the middle row of holes in the combustion chamber guards facilitates the ignition process



- ❒ Open the insulated door and the fuel loading door
- ❒ Check the ash level in the combustion chamber and clear out the ash if necessary

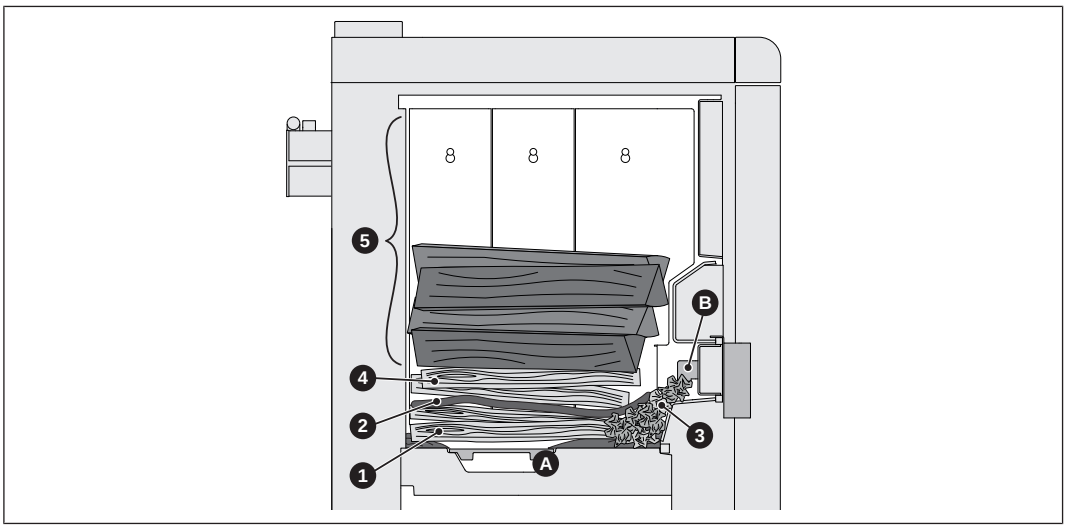
Recommendation: Do not remove the ash in the combustion chamber each time you heat up the boiler, but rather only when the middle row of holes (2) in the combustion chamber guard is no longer visible. An even layer of ash protects the combustion chamber and makes the heating-up process more efficient.

Heat up firewood manually

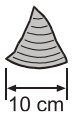


1. First layer of small pieces of split firewood
   - Length approx. 50 cm
   - Parts of the burn-out opening (A) in the grating must remain clear
2. Second layer with a generous amount of cardboard packaging up to the pre-heating chamber door
3. Third layer with more small pieces of split firewood
4. Depending on power consumption, fill the fuel loading chamber with firewood
   - ➲ "Determining the right amount of fuel" [▸ 28]

Pre-heat the firewood manually / with automatic ignition



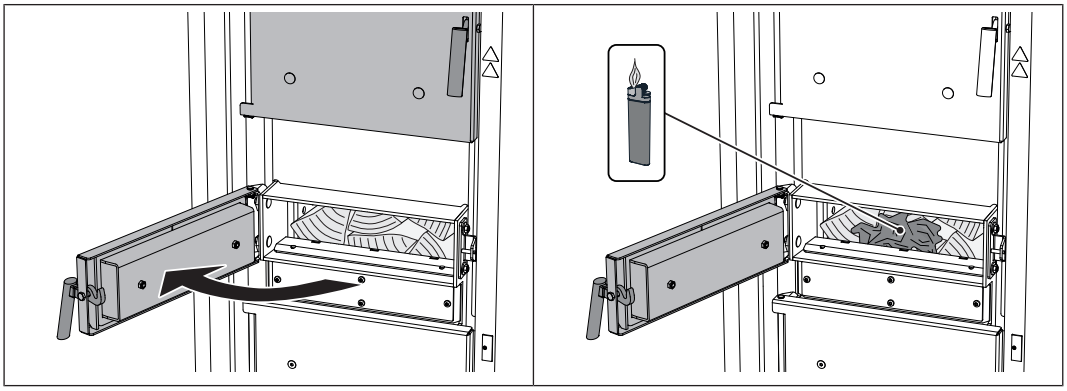
1. First layer of small pieces of split wood
   - Length approx. 50 cm
   - Parts of the burn-out opening (A) in the grating must remain clear
2. Second layer with a generous amount of cardboard packaging
3. Crumpled paper under the cardboard up to the pre-heating chamber door
   - Up to the basket plate (B) for automatic ignition
4. Third layer with more small pieces of split wood
5. Depending on power consumption, fill the fuel loading chamber with firewood
   - ➲ "Determining the right amount of fuel" [▸ 28]



Definition – small pieces of split firewood:

- Max. edge length of 10 cm along the cut side
- Arrange firewood with a length of approximately 50 cm lengthwise in the fuel loading chamber

4.5 Heat up firewood manually



❒ Close the fuel loading door

❒ Open the pre-heating door, insert crumpled up paper and light

❒ Close the pre-heating chamber door and the insulated door

IMPORTANT! If necessary, the pre-heating chamber door can remain open for a brief period while heating is active. If however any flue gas escapes, close the fuel loading door immediately.

4.6 Heat up the firewood with automatic ignition

IMPORTANT

Automatic ignition set incorrectly or not carried out

Possible damage to equipment from frost, etc.

Take the following precautions:

❒ Check the start time that has been set for automatic ignition

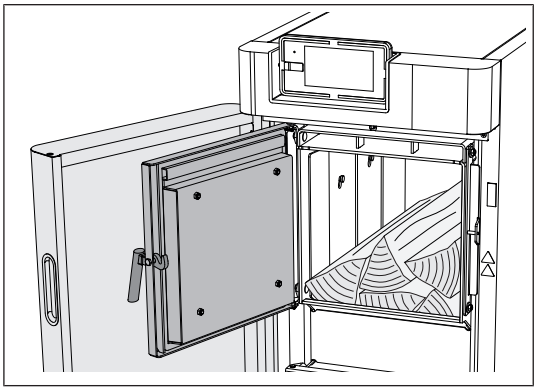
❒ After a short time, ensure that automatic ignition has been carried out successfully

↳ Due to differing fuel compositions, Froling cannot guarantee successful automatic ignition. The manufacturer/supplier is not responsible for resulting damage.

❒ Tap the "Ignition" button on the basic display

❒ Activate ignition with desired start criterion

After clock time (once)	Ignition process starts exactly at the set time (date and time).
After clock time (daily)	Ignition process starts daily at the set time.
Ignite immediately	Ignition process starts immediately once the insulated door is closed. The ignition is activated after the Lambda probe heat-up time has elapsed.
With external enable	The ignition process starts when the start contact on the core module (KM27) is closed.
According to the hydraulic requirement	The ignition process starts when a consumer assigned to the boiler requires heat in the hydraulic environment.
According to the hydraulic demand temperature	The ignition process starts when the temperature at a defined sensor (e.g. flow sensor assigned to the boiler in the storage tank) falls below the set value.



❒ Close the fuel loading door and insulated door

After closing the insulated door

- The boiler changes to "preventilation" status. To guarantee a safe boiler operating status and to rule out possible ignition by residual embers due to incomplete cleaning of the combustion chamber, the boiler attempts to reach "Heating" status within a specified safety time without activating the ignition.
- After this time has elapsed the boiler remains in "ignition wait" status until the time specified in the ignition menu for automatic ignition has been reached.

4.7 Reloading firewood

⚠ WARNING

Touching hot surfaces behind the insulated door

can cause burns!

By the nature of its operation, the surfaces and operating elements in the area behind the insulated door get hot! When working with firewood, there is also a risk of injury from splinters.

❒ When working on the boiler during operation, particularly when reloading fuel, always wear protective gloves.

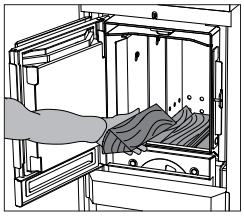
⚠ WARNING

Opening the fuel loading door

can cause injury, damage and smoke!

❒ Open the fuel loading door slowly and with care

❒ Close the fuel loading door again immediately after checking/reloading



❒ Open the fuel loading door slowly and check the fuel

If the fuel in the boiler has burnt down:

❒ Refill with fuel
➲ "Determining the right amount of fuel" [▸ 28]

If the fuel in the boiler has not finished burning down or if enough flue gases are still forming:

❒ Close the fuel loading door immediately

4.8 Switching off the power supply

⚠ WARNING

When the main switch is switched off in heating mode:

The boiler is placed in an uncontrolled state. Any resulting boiler malfunctions can cause serious injury and damage.

Therefore:

❒ Allow the fire to burn out completely and let the boiler cool, only then switch off the main switch.

↳ Induced draught switches off when operating status "Off" is reached (Boiler temperature < 65°C)

❒ Turn off the main switch

↳ Boiler controller is switched off

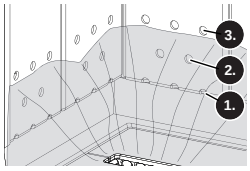
↳ There is no power supply to any of the boiler components

IMPORTANT! Frost protection function is no longer active!

4.9 Checking the ash level in the boiler

IMPORTANT

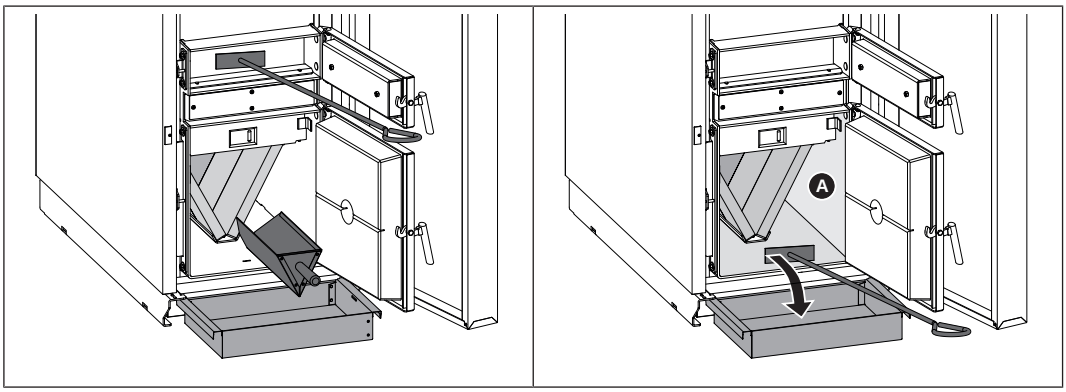
Cracks in the combustion chamber may occur during operation.
If the fireclay elements and the surrounding seals remain in their original position, existing cracks do not represent a malfunction!



Recommendation: Do not remove the ash in the combustion chamber each time you heat up the boiler, but rather only when the middle row of holes (2) in the combusion chamber guard is no longer visible. An even layer of ash protects the combustion chamber and makes the heating-up process more efficient.

Carry out all other cleaning work described in this section in the same way.

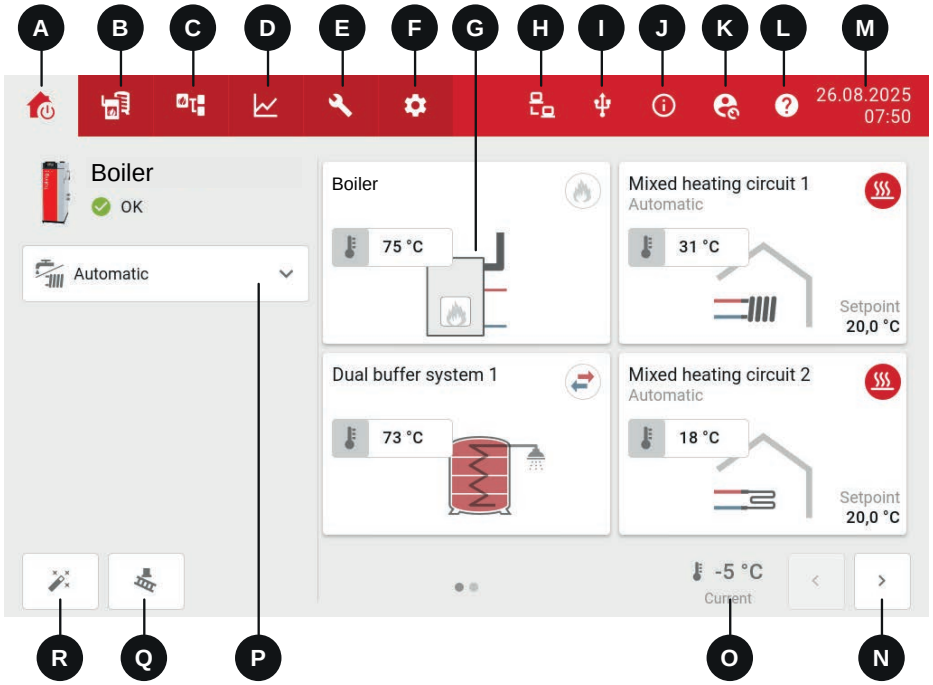
Removing ash



- ❒ Open the pre-heating chamber door and move the ash into the combustion chamber below using the furnace tool
- ❒ Open the combustion chamber door and remove ash from combustion chamber with an ash shovel
- ❒ Use a flat scraper to remove deposits from the side walls (A)
- ❒ Use a flat scraper to move ash alongside the combustion chamber into the ashcan
- ❒ Transport the ashcan to the emptying point

5 Operate the system using the touch display

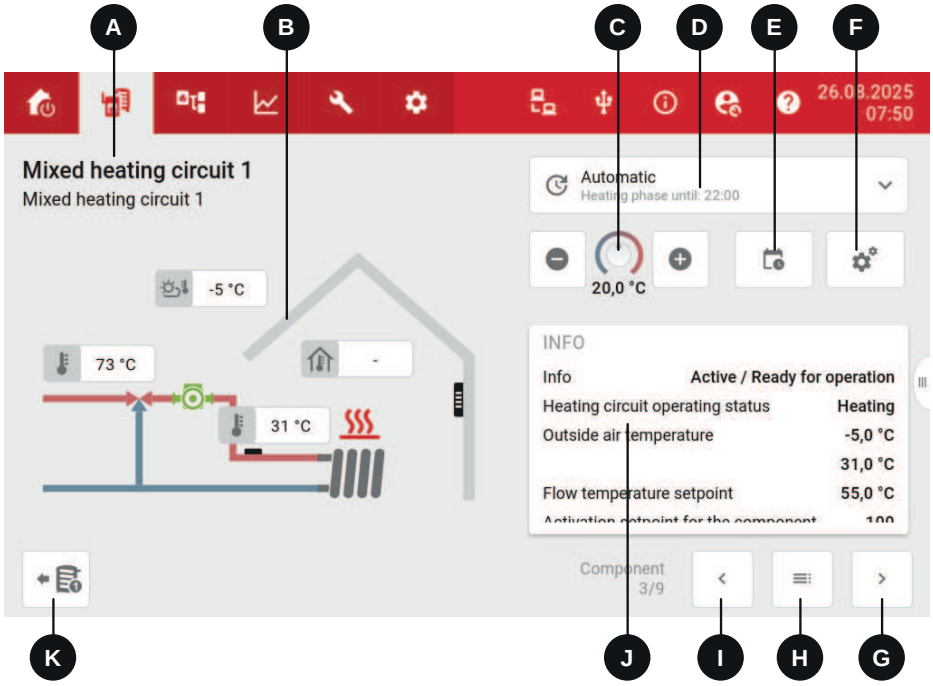
Basic display



A	Basic display ➲ "Basic display" [▶ 39]
B	Overview of the individual components ➲ "Components" [▶ 40]
C	Display of the system diagram ➲ "System diagram" [▶ 44]
D	Display of trend lines ➲ "Trend lines" [▶ 44]
E	Menu for maintenance and diagnostics ➲ "Maintenance & diagnostics" [▶ 44]
F	Call up the system settings. All parameters can be displayed and/or edited depending on the user's rights ➲ "Settings" [▶ 45]
G	Display of freely selectable information ➲ "Change information displays" [▶ 39]
H	Display symbol when using Fröling Connect ➲ "Connect status" [▶ 45]
I	Display when a USB stick is plugged in ➲ "USB stick" [▶ 45]
J	Display of status messages and current values ➲ "System info" [▶ 46]
K	Displaying and changing the user level

	➲ "User" [▶ 46]
L	Help menu to explain the current display ➲ "Help menu" [▶ 47]
M	Displaying and changing the current date/time ➲ "Setting the date and time" [▶ 47]
N	Switch to next page
O	Current outside air temperature
P	Display of current operating status, switching the boiler ON/OFF
Q	Chimney sweep function
R	Configurator for user-defined settings

Component view



A	Designation of the component
B	Graphical representation of the component
C	Setting the desired temperature setpoint (room temperature, domestic hot water temperature, etc.)
D	Current operating mode
E	Timed program of the component
F	Settings
G	Page to the next component
H	Overview of all components with direct dialling
I	Scroll to the previous component
J	Overview of all current values
K	Display of source or consumers of the component with direct selection

5.1 Status display

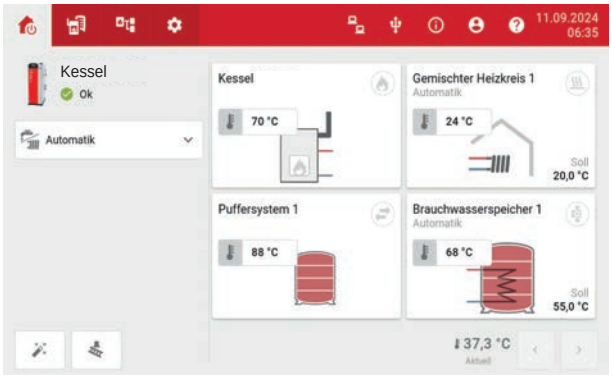
The LED frame (A) on the boiler controller indicates the current system status.

- Constant in the set colour: **SWITCHED ON**
  - The boiler has no faults and is in an operating state (ready for operation, heating, ...)
  - The colour can be changed using the "First switch-on" settings wizard
- ORANGE flashing: **WARNING**
- RED flashing: **FAULT**

5.2 Control icons

	Discards any values entered without saving; and closes messages
	Scroll to the right or left
	Back to higher menu level
	Back to basic display
	Component overview
	Open settings
	Setting times
	Setting parameters

5.3 Basic display

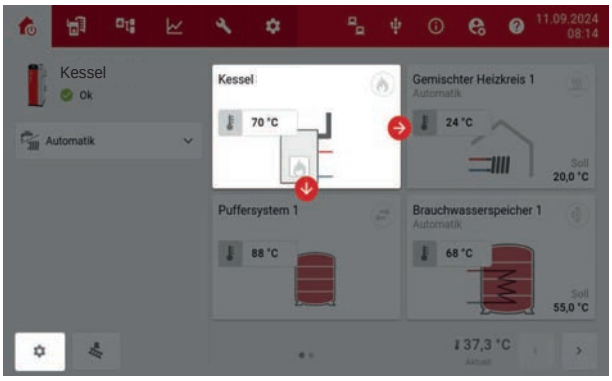


The first page of the basic screen shows an overview of the heat source and the dashboard. All visible components and their most important values are listed here. The display and position of the components can be customised. Several pages are available, between which you can switch using the swipe gesture or arrow symbol. The operating mode of the heat source can be set and the respective component overview can be opened by tapping on the tiles.

5.3.1 Change information displays

Tapping on freely selectable information displays on the basic screen opens the overview of the respective component. The selection depends on the configuration.

❒ Tap the desired display for two seconds



❒ Change position by tapping on the arrows or by swiping

By tapping on the gear wheel symbol, the display of the component can be changed (simple, visual or detailed).

5.4 Components

The view consists of a graphical representation of the component with current values on the left-hand side and an information display and various setting options on the right-hand side. Depending on the selected component, the operating mode can be set, temperatures and times adjusted and the settings called up.

5.4.1 Changing the operating mode of the component

The operating mode of the component can be changed by tapping the button. Different operating modes are available depending on the selected component.

Heating circuit operating modes

	**Automatic** The heating circuit is activated according to the switch-on/switch-off criteria and the set timed program.
	**Continuous setback mode** The heating circuit is controlled with the defined temperatures for the set-back phase. The heating phases of the time programme are ignored.
	**Sustained comfort** The heating circuit is controlled with the defined temperatures for the heating phase. The setback phases of the time programme and the maximum outdoor temperature in the heating phase are ignored.
	**Frost protection/standby** The heating circuit control is deactivated. On/off criteria and time programme are ignored. From a defined temperature at the flow sensor or room temperature sensor (depending on the configuration), the heating circuit pump is activated to prevent frost damage.
	**Temporary set-back** The heating circuit is controlled for an adjustable duration with the defined temperatures for the set-back phase. The heating phases of the time programme are ignored.
	**Temporary comfort** The heating circuit is controlled for an adjustable duration with the defined temperatures for the heating phase. The setback phases of the time programme and the maximum outdoor temperature in the heating phase are ignored.

Hot water tank operating modes

	**Off** On/off criteria and timed program are ignored. Frost protection and legionella function remain active.
	**Automatic** The hot water preparation is controlled according to the switch-on/switch-off criteria and the set timed program.
	**Extra loading** Hot water preparation is carried out once, regardless of the defined recharge temperatures and set timed program.

5.4.2 Change temperatures

Change room temperature

❒ Tap the information display of the desired heating circuit or navigate to the respective view in the component menu.

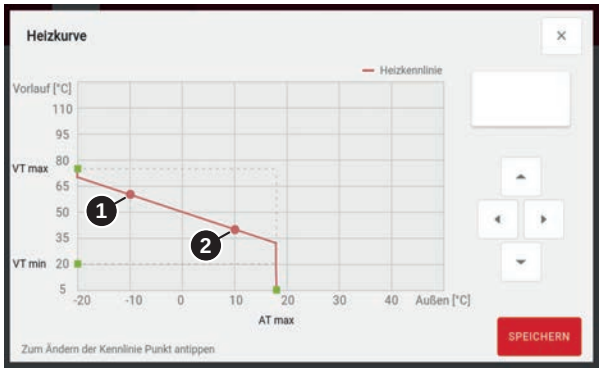
❒ Adjust the room temperature by tapping the plus or minus symbol

Adjusting the heating characteristic

❒ Tap the information display of the desired heating circuit or navigate to the respective view in the component menu

❒ Tap on the gear wheel symbol and navigate to the "Heating curve" menu

❒ Increase or reduce the values of the two parameters depending on the situation.



The specified values apply to the flow temperature at -10°C (point 1) and +10°C (point 2). Together they define the heating characteristic curve, which is used to calculate the flow temperature of the heating circuit depending on the outside temperature.

Example:
The heating curve is defined with 60°C (at -10°C outside air temperature) and 40°C (at +10°C outside air temperature). If for example the current outside temperature is -2°C, this would result in a calculated flow temperature of 52°C. The two values together define the heating curve and should not be thought of as limit values. For example n outside temperature of -13°C would result in a calculated flow temperature of 63°C.

Situation	Effect
Room temperature generally too low	Move the heating curve up in parallel. ❒ Increase point 1 and point 2 by the same temperature increment **NOTE:** Changing the room temperature via the plus or minus symbol also shifts the heating characteristic curve in parallel, ➲ "Change room temperature" [▸ 41]
Room temperature on cold days too low, OK on warm days	Changing the slope of the heating curve. ❒ Increase point 1
Room temperature on warm days too high, OK on cold days	Changing the slope of the heating curve. ❒ Reduce point 2

If the heating curve is to be changed, never change the desired point for a high temperature circuit by more than 5°C, and never change the desired point for a low temperature circuit by more than 3°C. Once the changes have been made, wait a few days and assess comfort levels before carrying out further changes!

Changing the DHW tank temperature

❒ Tap the information display of the desired domestic hot water tank or navigate to the relevant view in the components menu.

❒ Adjust the DHW tank temperature by tapping the plus or minus symbol

5.4.3 Renaming a component

A freely selectable designation can be assigned to each component.

❒ Tap in the area of the component designation

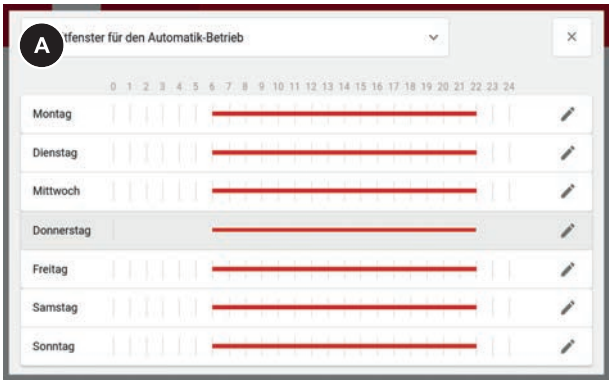
❒ Enter the desired designation and confirm it

5.4.4 Changing times

Different timed programs can be set in the component overview depending on the component and authorisation.

❒ Tap on the time symbol

↳ The dialogue for adjusting the time windows opens



❒ Select which timed program is to be changed in the drop-down field (A)

❒ Tap on the pencil symbol

❒ Set the start time and end time for the desired weekdays

↳ The time window set is saved for all selected days of the week

To delete a saved time window, tap on the “Recycle bin” icon next to it.

5.5 System diagram

If a system diagram is configured, it is displayed here. It can be configured individually and consist of several pages.

5.5.1 Configure system diagram

To configure a system diagram, a USB stick with suitable files must be connected.

The following file formats are available:

- .png
- .jpg

Optimum resolution: 832x500 px

File size: max. 2.5 MB

❒ Tap on the gear wheel symbol in the bar at the top and navigate to the "System diagram" menu

❒ Tap on the "Add new system diagram" button

❒ Tapping on the display opens the selection dialogue

❒ Select and confirm the desired file

↳ The image file is displayed

❒ Tap on a point on the system diagram to add a value there

↳ Any number of values can be inserted. The values can be moved by tapping and dragging.

❒ Tap the pencil icon to open the settings dialogue

↳ Select the desired symbol and value to be displayed

❒ Tap on the arrow symbol to confirm and move to the next view

❒ Enter and confirm the desired name for the system diagram

↳ The configured system schematic is now displayed under "System schematic"

5.6 Trend lines

Functions for displaying the trend of the current boiler values (e.g. temperatures) are available depending on the version of the system and user authorisation.

5.7 Maintenance & diagnostics

Depending on the system version and user authorisation, functions for maintenance and troubleshooting are available.

5.8 Settings

Depending on the user level and system configuration, the available menu items are displayed and various settings can be made.

5.9 Connect status

The status of the connection to Fröling Connect is displayed in this overview. Fröling Connect can be activated and various settings can be made.

5.10 USB stick

The symbol appears when a USB stick is connected to the boiler controller. Different functions are available depending on the files contained on the storage medium.

Activate trend recording

The trend recording is automatically exported to the storage medium.

- Red: Recording not active
- Red flashing: Recording active
- Yellow: Recording (system error)

Start software update

If a software update is available on the storage medium, it can be started.

Licence

If a valid licence file is available on the storage medium, the corresponding user level is activated.

Export current system image

The current system image is exported to the storage medium.

Import system image

If the storage medium contains a system image, this can be transferred to the system.

IMPORTANT! Current settings are overwritten! It is recommended to export the current system image beforehand.

Exported log file

The log file is exported to the storage medium. You can choose between live data (plant) and system (operating system).

USB stick

The storage medium is safely ejected and can be disconnected from the boiler controller.

5.11 System info

Status messages, current values and active manual switches are displayed in this menu.

5.12 User

The current user is displayed. Four different user levels are available.

Operating company	Standard user level with all of the regularly required functions and parameters
Expert	Additional parameters and manual operation are available. Advanced diagnostic options are available.
Service	For configuration and commissioning of the system as well as access to control parameters.

5.12.1 Operating level with USB stick

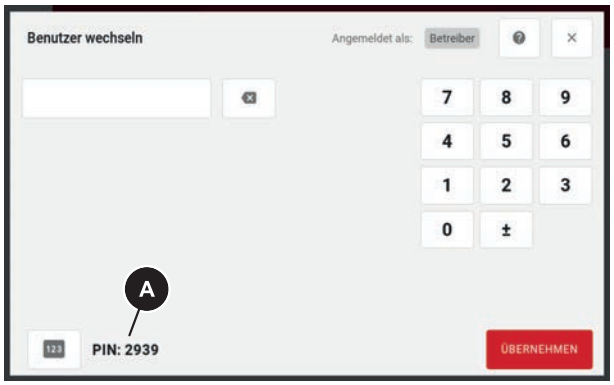
A USB stick with a licence file is required to switch to the “Service” user level. The required file is available in the Fröling partner area for authorised users.

If the controller detects a valid licence file on the connected USB stick, it automatically switches to the “Service” user level. Tapping the service icon displays the licence file data.

5.12.2 Operating level with one-time password

If no USB stick with a licence file is available, the one-off password can be entered to switch to the “Service” user level, if required.

❒ Contact Fröling customer service, see back of these instructions



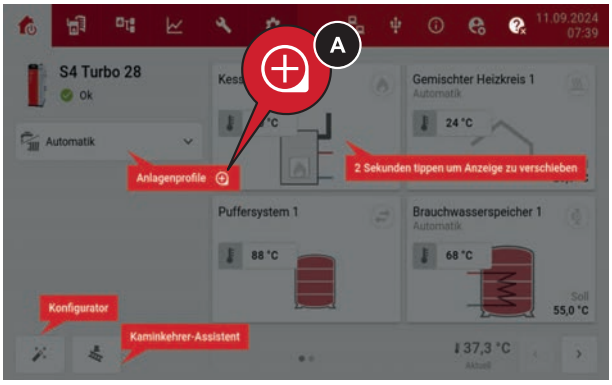
❒ Enter the four-digit PIN when prompted by the customer services technician

↳ The customer services technician will use the PIN to generate a five-digit one-off password

❒ Enter the one-off password and confirm

↳ “Service” user level is active until the user logs out or a set time has expired

5.13 Help menu



Tapping on the help symbol displays information on symbols and components. In addition, pressing the "+" symbol (A) can open an information window for some elements, where the function is described in detail.

The info window can also be opened in the component settings by pressing a parameter for 2 seconds.

5.14 Setting the date and time

13.11.2023
14:53

❒ In the date and time area, tap

↳ The menu for setting the date and time will be displayed

❒ Tap the "Date and time" button and adjust the values as required

Synchronise date and time via time server

If the controller is connected to a network via an Internet connection or local time server, the automatic retrieval of the date and time is recommended.

6 Servicing the system

6.1 General information on servicing

⚠ DANGER

When working on electrical components:

Risk of electrocution!

When work is carried out on electrical components:

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

⚠ WARNING

During inspection and cleaning work on the hot boiler:

Hot parts and the flue spigot can cause serious burns!

- ❒ Always wear protective gloves when working on the boiler
- ❒ Only operate the boiler using the handles provided
- ❒ Before inspection and cleaning work in/on the boiler, allow the fuel in the boiler to burn off
- ❒ Allow boiler to cool off and switch off main switch

⚠ WARNING

When inspecting and cleaning the boiler with the main switch on:

Serious injuries possible due to boiler/individual components starting up automatically (induced draught)!

Before inspection and cleaning work in/on the boiler:

- ❒ Allow the fuel in the boiler to burn off
- ❒ Allow boiler to cool off and switch off main switch

⚠ WARNING

Incorrect inspection and cleaning:

Incorrect or insufficient inspection and cleaning 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!

Take the following precautions:

- ❒ Clean the boiler following the instructions in the instruction manual. Follow the boiler operating instructions.

IMPORTANT

We recommend you keep a maintenance book in accordance with ÖNORM M7510.

⚠ DANGER

If maintenance work is performed when the system is in operation:

Risk to life from high voltage electrodes!

Prior to working on the electrostatic particle separator, ensure the following:

- ❒ Switch off the power supply and take precautions to prevent accidental switching on
- ❒ Earth and short circuit HV electrodes
- ❒ Always have work carried out by a qualified electrician
- ❒ Observe the applicable standards and regulations
  - ↳ Work must not be carried out on electrical components by unauthorised persons

⚠ CAUTION

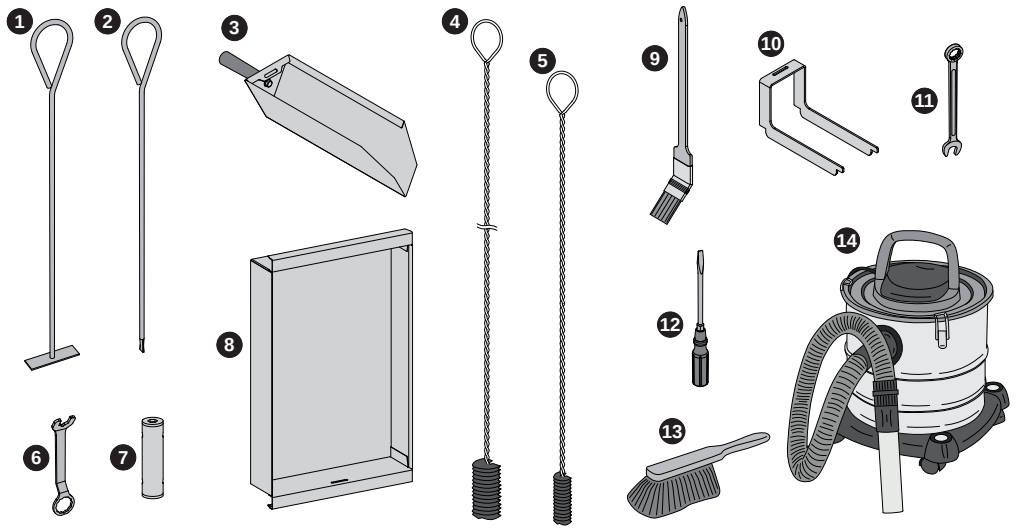
Increased dust buildup during maintenance work on the electrostatic particle separator!

Therefore:

- ❒ Wear a dust mask of filter class FFP-2 or higher

6.2 Required tools

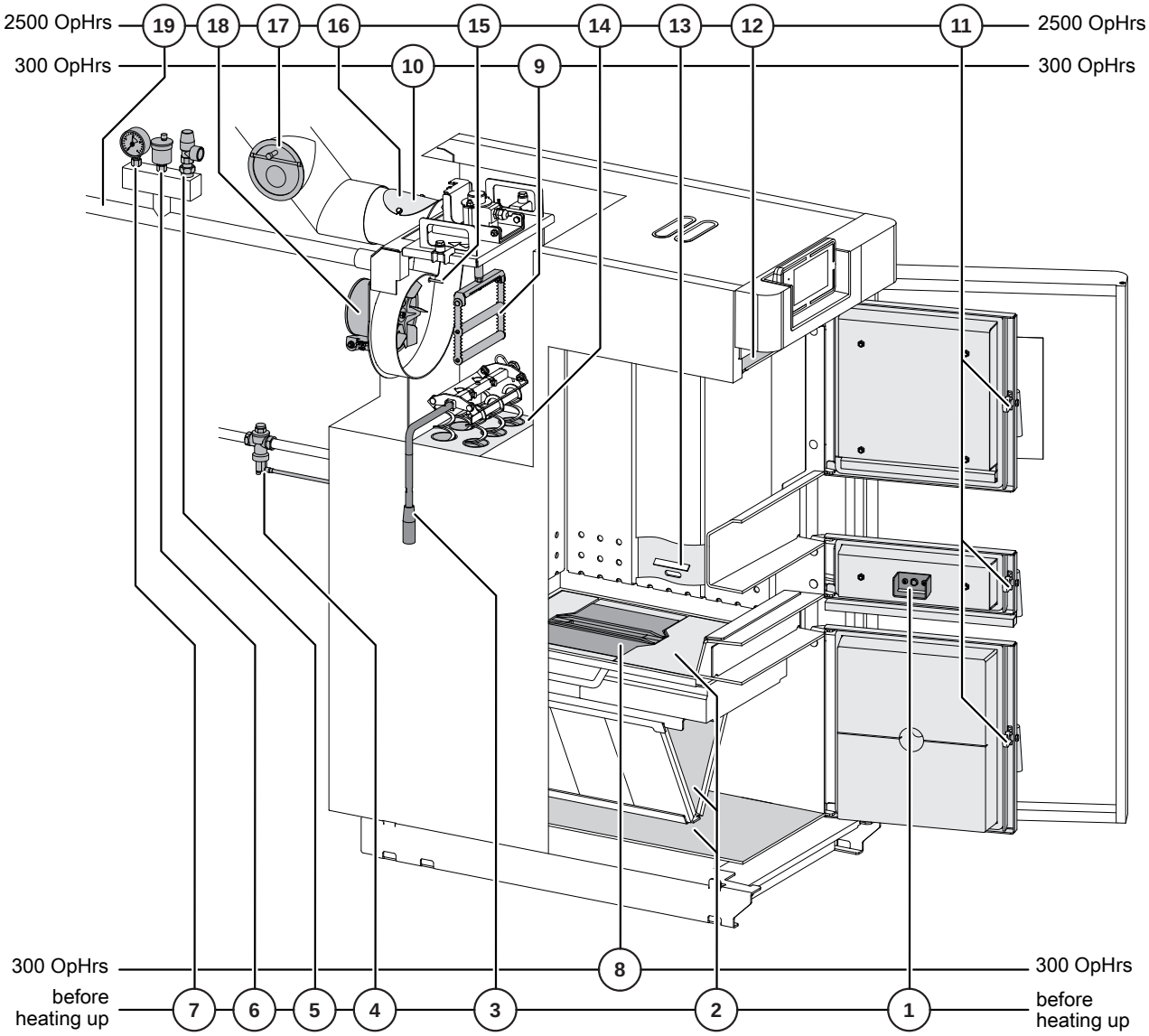
The following tools are required in order to proceed with cleaning and maintenance tasks:



Included in delivery:	
1	Flat scraper
2	Stoking rod
3	Ash shovel
4	Cleaning brush Ø 54 x 1350
5	Cleaning brush 30 x 20 x 900
6	Spanner for door mountings
7	Socket wrench for Lambda probe and heat exchanger cover
8	Ash drawer
9	Cleaning brush (for boilers with an electrostatic particle separator)
10	Mounting aid for WOS suspension link

The following items are not included in the delivery:	
11	Open-jaw or ring wrench AF 13
12	Screwdriver set (slotted, Torx T25)
13	Small broom or cleaning brush
14	Ash vacuum

6.3 Maintenance overview



1	Check the igniter tube (for automatic ignition)	**11**	Check the seals on the doors
2	Check the ash level in the boiler	**12**	Clean the carbonisation gas duct
3	Operate the WOS lever	**13**	Check the primary air openings
4	Check the thermal discharge valve	**14**	Clean the heat exchanger pipes
5	Check the safety valve	**15**	Clean the flue gas temperature sensor
6	Check the quick vent valve	**16**	Clean the flue gas pipe
7	Check the system pressure	**17**	Check the draught regulation damper
8	Clean the cast iron grate	**18**	Clean the induced draught fan
9	Clean electrode and interior (for ESP)	**19**	Check the heating water
10	Clean flue gas pipe (for ESP)		

6.4 Maintenance work by the operator

❒ Regular cleaning of the boiler extends its life and is a basic requirement for smooth running.

❒ Recommendation: Use an ash vacuum for cleaning.

Reassemble the boiler components dismantled during maintenance in the reverse order after the work has been completed..

6.4.1 Inspection

Checking the system pressure

❒ Check the system pressure on the pressure gauge

↳ The value must be 20% above the pre-stressed pressure of the expansion tank
IMPORTANT! Check that the position of the pressure gauge and rated pressure of the expansion tank match your installer's specifications!

If the system pressure decreases:

❒ Top up with water
IMPORTANT! If this happens frequently, the seal of the heating system is faulty! Inform your installer

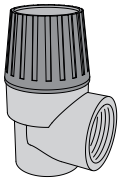
If large pressure fluctuations are observed:

❒ Ask an expert to inspect the expansion tank

Checking the thermal discharge safety device

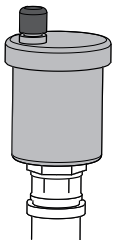
❒ Regularly check the function and seal of the thermal discharge valve in accordance with the manufacturer’s instructions

Checking the safety valve



❒ Check the seal of the safety valve regularly and ensure that the valve is not dirty
IMPORTANT! The inspection work must be carried out in accordance with the manufacturer's instructions.

Checking the quick vent valve



❒ Regularly check all the quick vent valves on the entire heating system for leaks

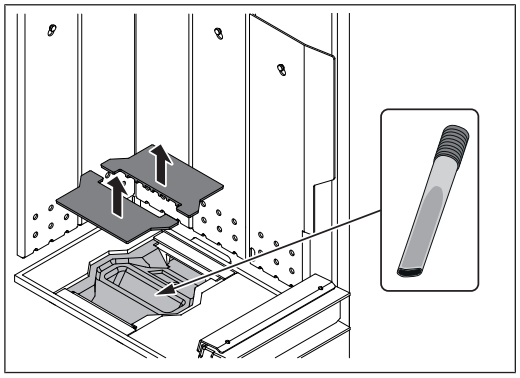
↳ If any liquid is leaking, replace the quick vent valves

6.4.2 Periodic inspection and cleaning

The boiler must be inspected and cleaned at appropriate intervals depending on the operating hours and fuel quality.

Depending on the activity, inspection and cleaning must be repeated after 300 operating hours or at least every month or after no more than 2500 operating hours or at least once a year. For less efficient fuels (e.g. high ash content) this work must be carried out more frequently.

Clean the cast iron grate



❒ Open the insulated door and the fuel loading chamber door

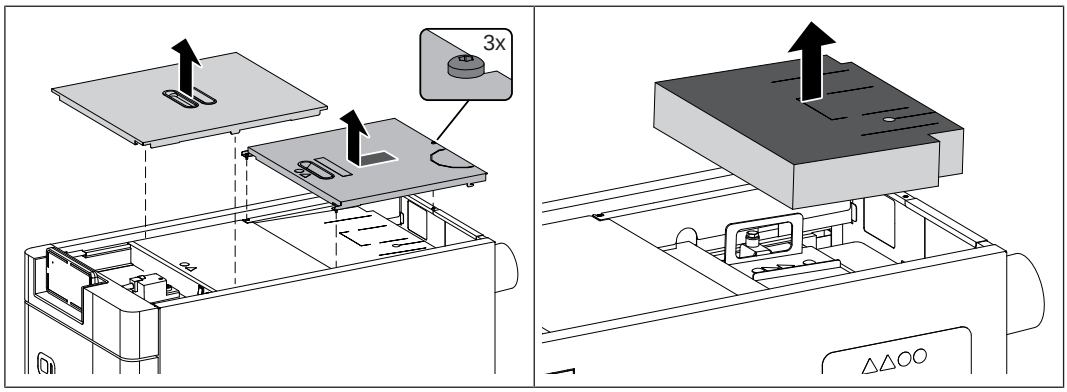
❒ Remove the two-part grating

❒ To ensure an unobstructed intake of secondary air, remove the ash deposits from under the cast iron grate

↳ TIP: Use an ash vacuum

Clean electrode and interior (for ESP)

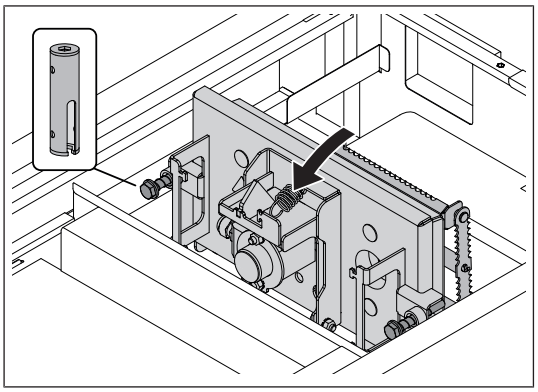
The electrode and interior should be cleaned after 300 operating hours or once a month at the latest. It is not necessary to expand the WOS system.



❒ Remove the front cover

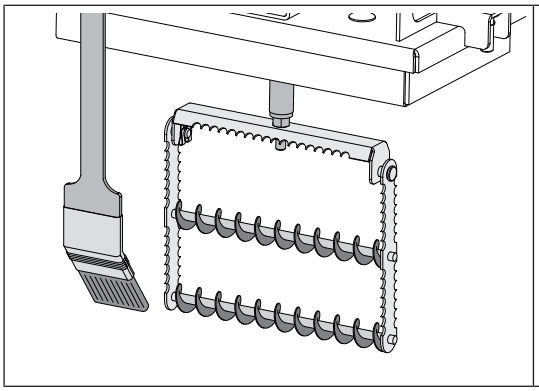
❒ Undo the three retaining screws on the rear cover and remove the cover

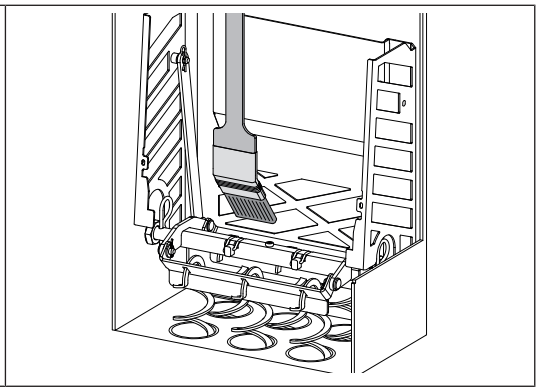
❒ Remove rear thermal insulation



❒ Loosen the screws on the heat exchanger cover and open the heat exchanger cover forwards

↳ Pay attention to the HV cable and extension cable of the lambda probe



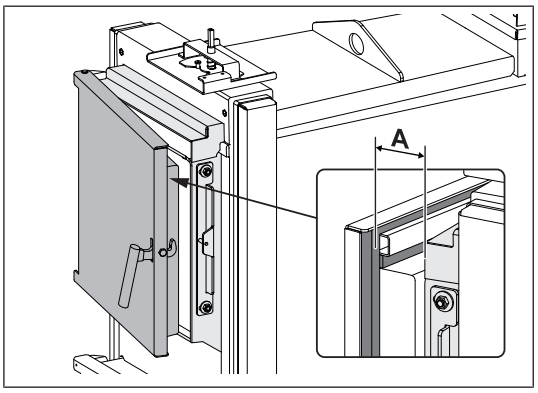


❒ Remove soot and ash deposits from the spray electrode of the electrostatic particle separator

❒ Clean WOS suspension links, cleaning basket and entire interior using a cleaning brush
TIP: Remove any ash which has gathered using an ash vacuum

Checking the seal on the doors

The following steps are illustrated based on the fuel loading door. Perform these steps in the same way for the pre-heating and combustion chamber door.

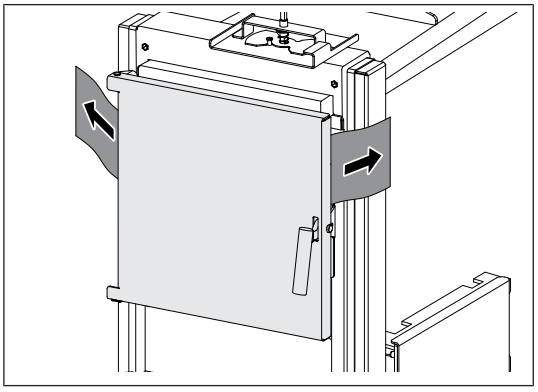


❒ Close the door

↳ A slight resistance can be felt when there is a gap (A) of 2-3 cm:
Adjustment on the hinge side OK

↳ No resistance felt:
Move hinge backwards
➲ "Adjusting the doors" [▸ 56]

↳ Resistance can be felt when there is a gap of more than 3 cm:
Move hinge forwards
➲ "Adjusting the doors" [▸ 56]



❒ Open the door

❒ Place a sheet of paper on both sides of the door and close the door

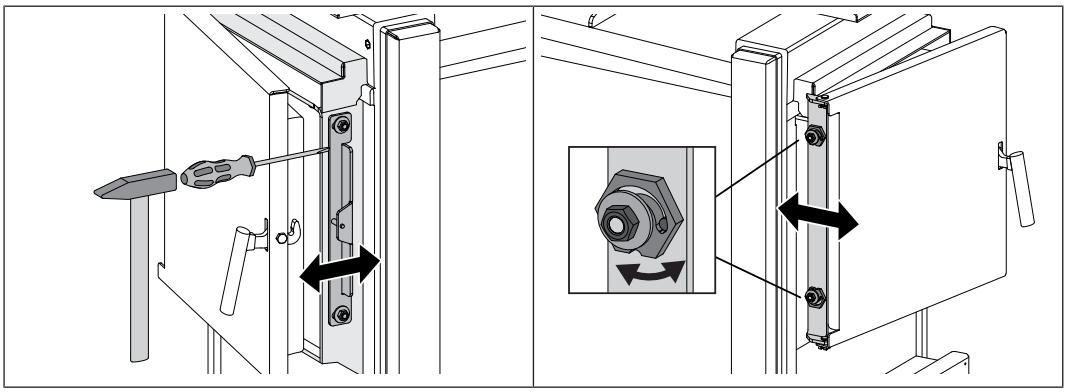
❒ Try to pull out the sheet of paper

↳ If the paper cannot be removed:
The door is sealed

↳ If the paper can be removed:
The door is not sealed - Move hinge or locking plate backwards
➲ "Adjusting the doors" [▸ 56]

Adjusting the doors

The following steps are illustrated based on the fuel loading door. Perform these steps in the same way for the pre-heating and combustion chamber door.



❒ Loosen the nuts on the locking plate

❒ Use a suitable tool, to move the locking plate forwards or backwards

❒ Tighten the nuts on the locking plate

❒ Loosen the nuts on the door hinge

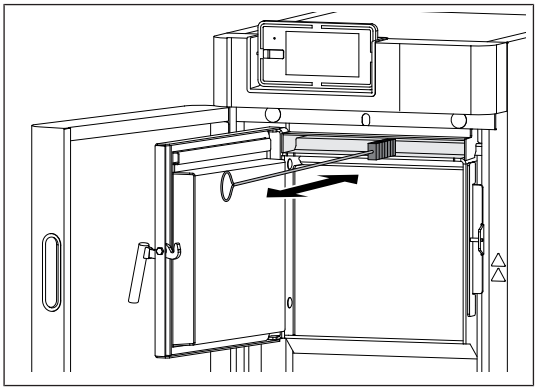
❒ Use a hexagonal wrench (width across flats 32 mm) to move the locking cam (B) forwards or backwards

❒ Tighten the nuts on the hinge

IMPORTANT: Align the locking plate and hinge identically at the top and bottom

❒ Once the doors have been adjusted, check them again for leaks, ➲ "Checking the seal on the doors" [▸ 55]

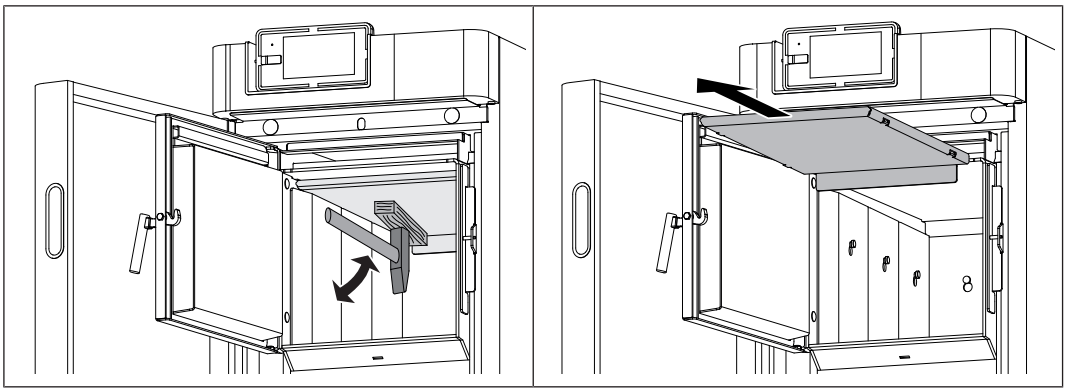
Cleaning the carbonisation gas duct



❒ Open the insulated door and the fuel loading chamber door

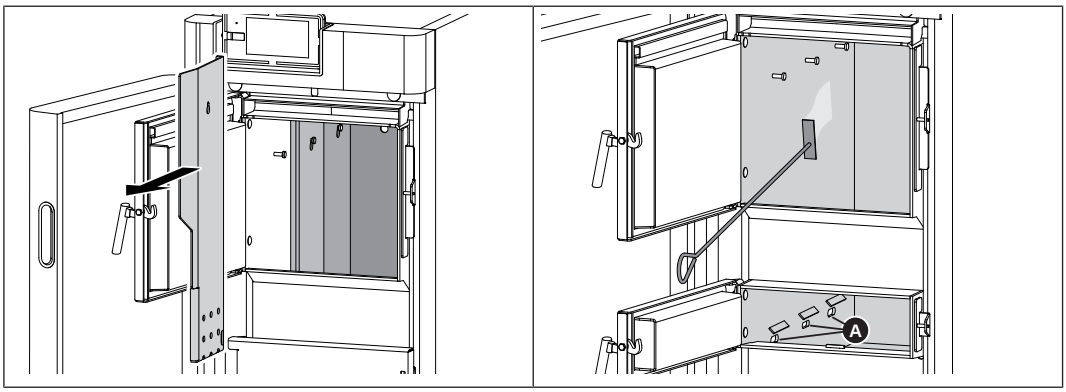
❒ Clean the low-temperature carbonization gas duct with a small brush

Check the primary air openings



❒ Using a hammer, carefully free the combustion condensate residues if necessary, in order to loosen the insulating apron

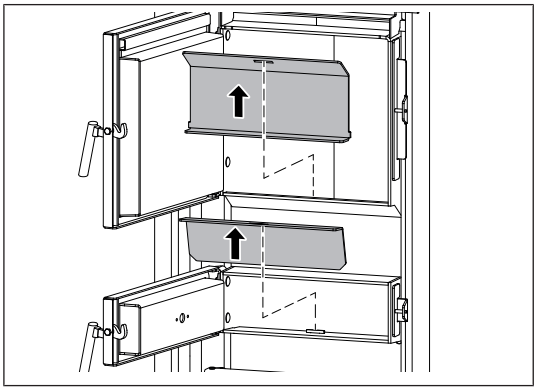
❒ Pull the insulating apron forwards and out



❒ Take off the cladding plates and clean them

❒ Clean the inner walls using the flat scraper

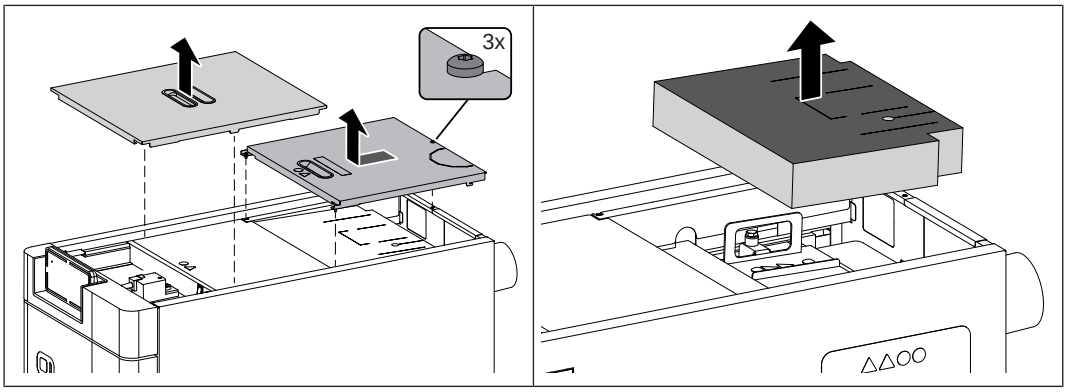
❒ Check the primary air openings (A) inside the boiler for unobstructed air flow and clean if necessary



❒ Unhook and clean the front air deflectors

Clean heat exchanger pipes and electrode (for ESP)

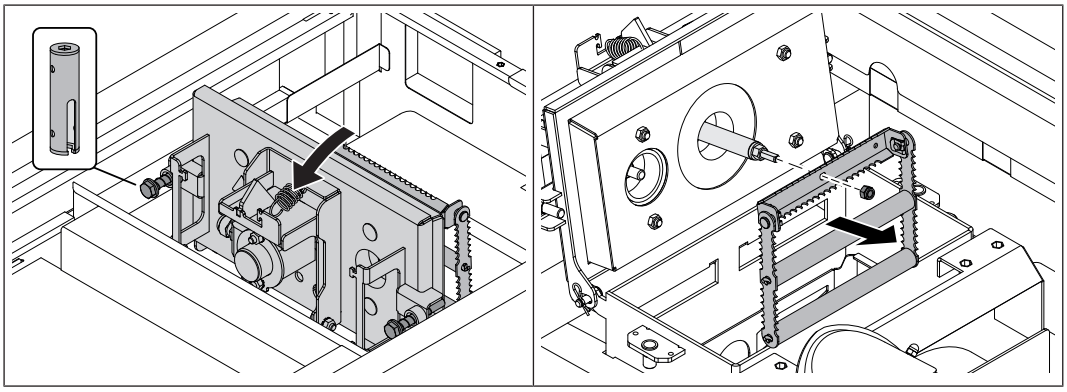
The following steps show a boiler with an electrostatic particle separator (ESP). Some disassembly steps are not required for boilers that do not have an electrostatic particle separator.



❒ Remove the front cover

❒ Undo the three retaining screws on the rear cover and remove the cover

❒ Remove rear thermal insulation

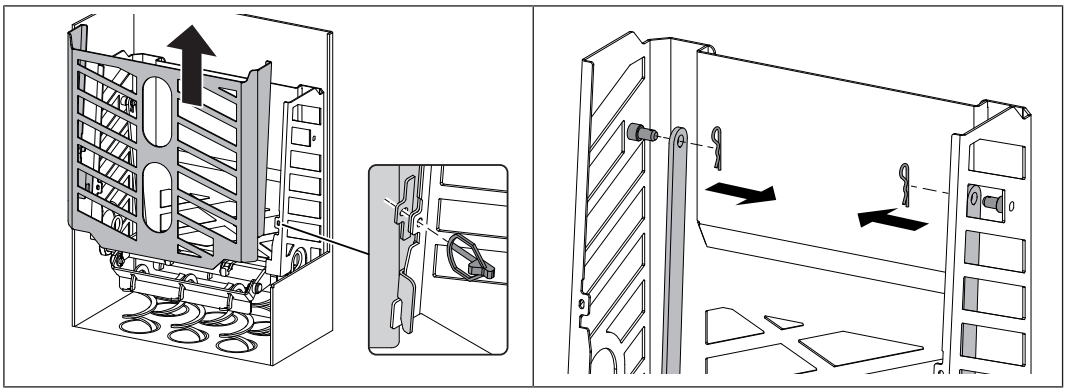


❒ Loosen the screws on the heat exchanger cover and open the heat exchanger cover forwards

↳ Pay attention to the HV cable and extension cable of the lambda probe

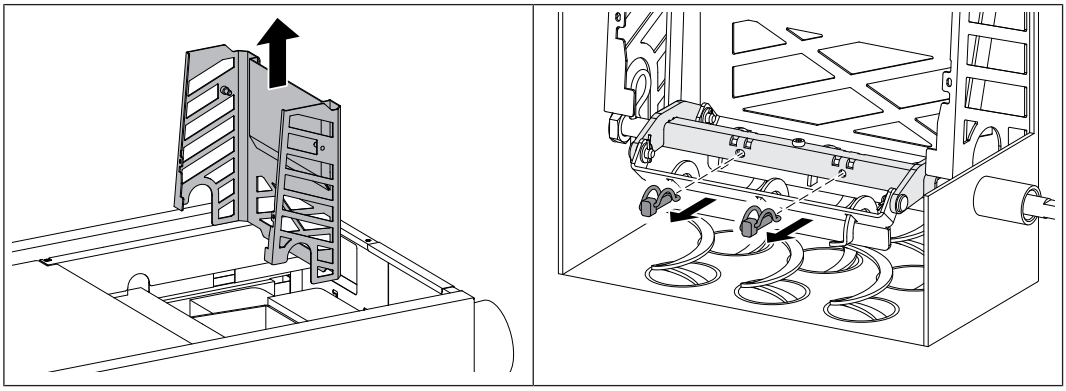
Tip for easier disassembly of the following components:

❒ Loosen M8 hexagonal nut and remove spray electrode



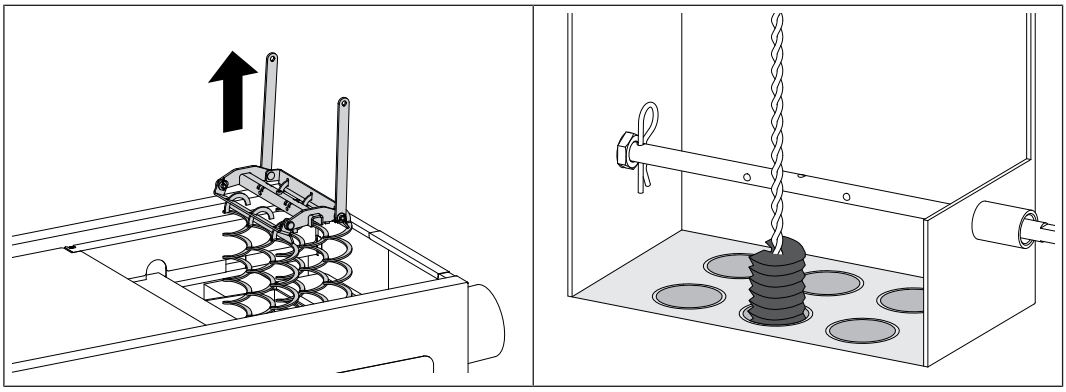
❒ Remove two linchpins and pull the front cleaning basket out of the heat exchanger

❒ Dismantle the spring cotter on the drive levers



❒ Pull the rear cleaning basket out of the heat exchanger

❒ Dismantle the pipe locking pin on the WOS suspension link

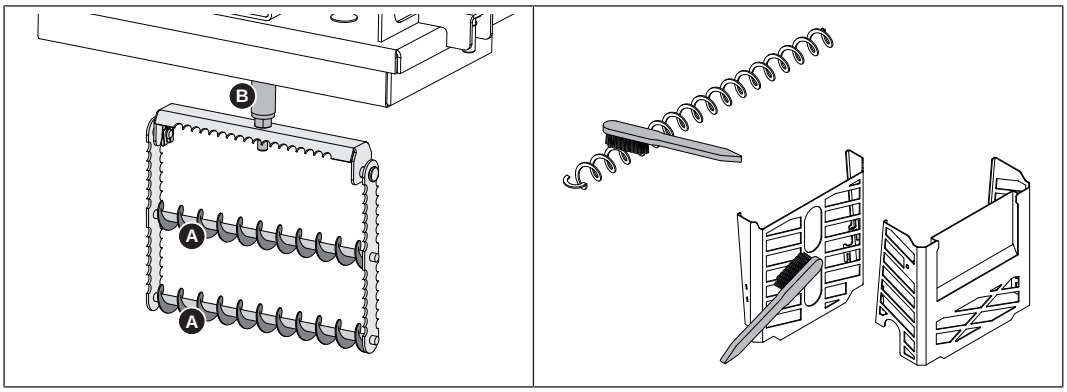


❒ Pull the WOS suspension link out of the heat exchanger

❒ Clean the heat exchanger pipes with the brush provided

↳ Push the cleaning brush all the way through before pulling it up

↳ Bristles cannot be turned in the pipe

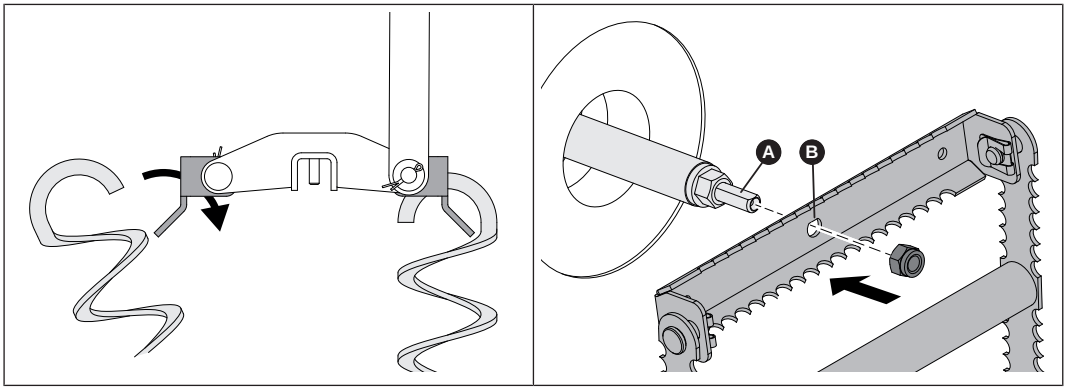


❒ Remove soot and ash deposits from the spray electrode brushes (A) and insulator (B)
TIP: Use a scouring agent and a non-woven abrasive to clean the insulator (B)

❒ Use a brush to clean WOS springs and cleaning baskets

❒ After cleaning, install all of the WOS components analogously in the reverse order

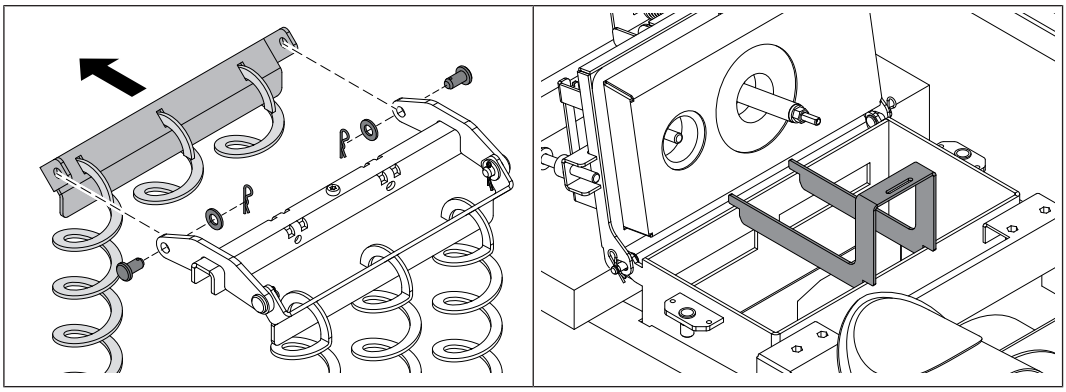
Note during installation



❒ Hook the WOS springs into the suspension plate as shown

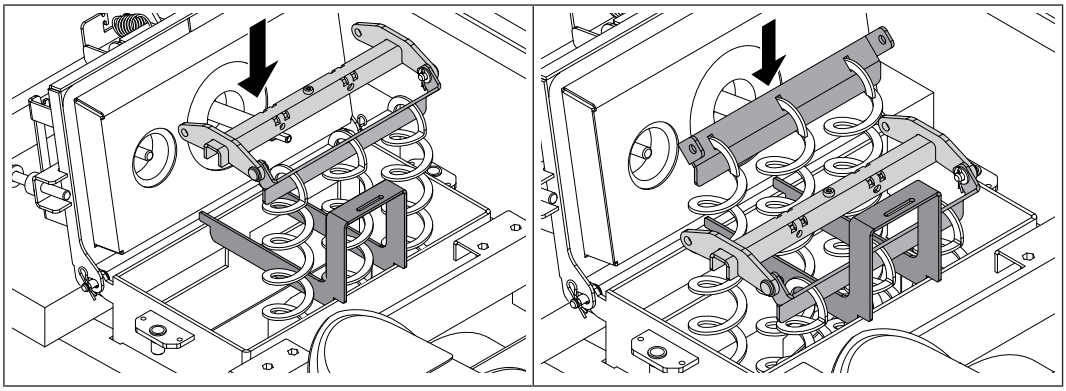
❒ Note the flattening on the insulator (A) and on the spray electrode (B)

TIP: To simplify the insertion of the WOS springs into the heat exchanger, the WOS suspension link can be split. The mounting aid is required for the subsequent assembly of the WOS suspension link.



❒ Dismantle the suspension plate and WOS springs on the WOS suspension link
- 2x eyebolts, Ø8x16

❒ Attach the mounting aid to the frame of the boiler body



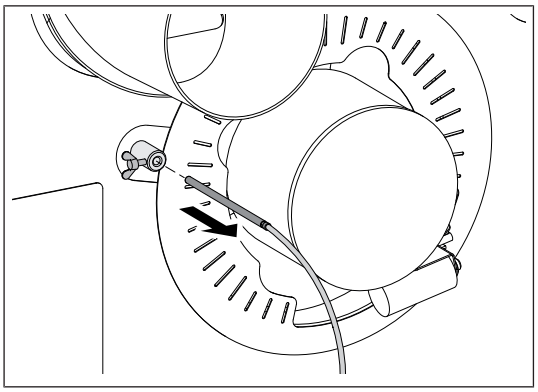
❒ Slide the first part of the WOS springs into the heat exchanger and place the WOS suspension link on the mounting aid

❒ Push the second part of the WOS springs into the heat exchanger

❒ Refit the suspension plate on the WOS suspension link
- 2x eyebolts, Ø8x16

❒ Pull out the mounting aid and push the WOS suspension link completely into the heat exchanger

Clean the flue gas temperature sensor



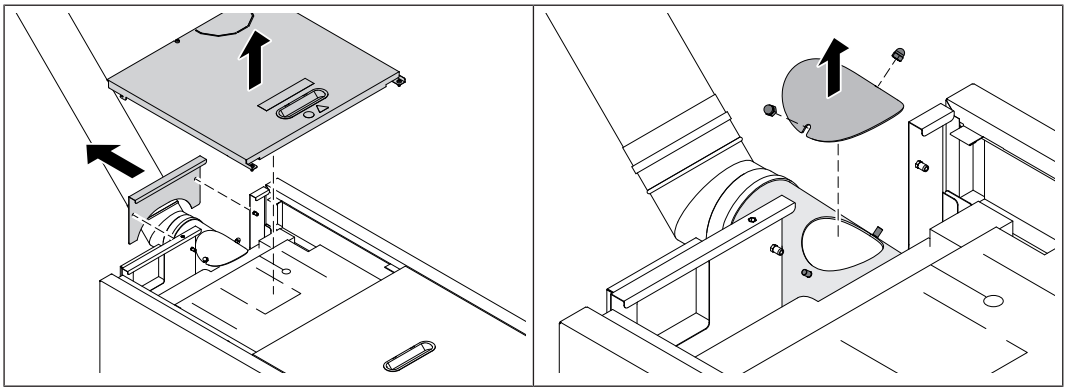
❒ Loosen the retaining screw and pull the flue gas temperature sensor out of the bushing

❒ Clean the flue gas temperature sensor using a clean cloth

❒ Fully insert the flue gas temperature sensor during installation, then pull it approx. 2 cm out of the bushing and secure with the retaining screw

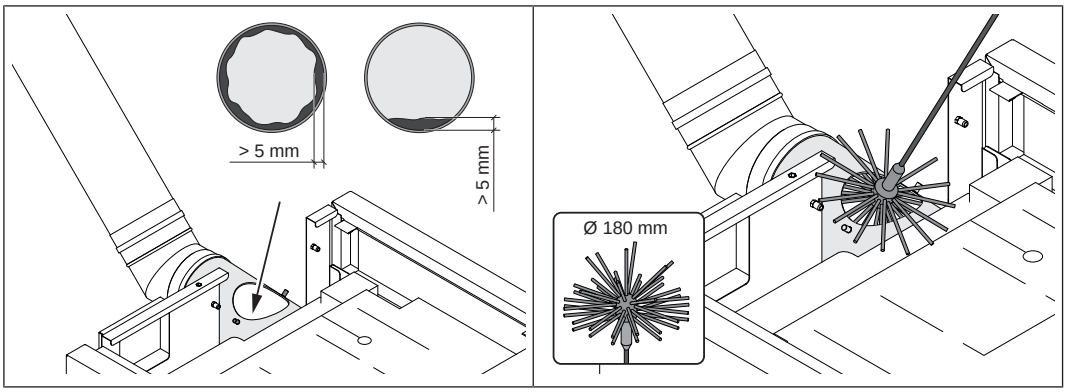
Cleaning the flue gas pipe

IMPORTANT! For boilers with an electrostatic particle separator, check and clean the flue gas pipe after 300 operating hours at the latest or at least once a month.



❒ Dismantle the covers on the boiler

❒ Remove the inspection cover from the flue gas pipe



❒ Check the entire flue gas line for impurities

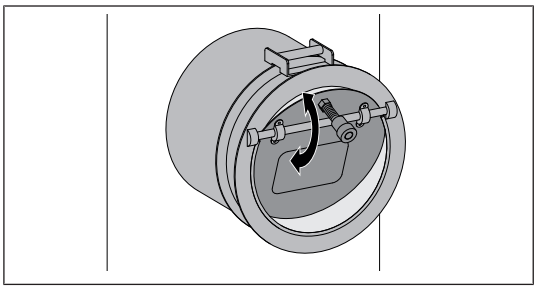
↳ If there are visible deposits larger than 5 mm, clean the flue gas line

❒ Clean the connecting pipe between the boiler and chimney with a chimney sweeping brush

↳ Depending on how the flue gas pipes and chimney draught are installed, adjust the cleaning intervals according to the degree of soiling

↳ Chimney sweep brush available from Fröling GesmbH

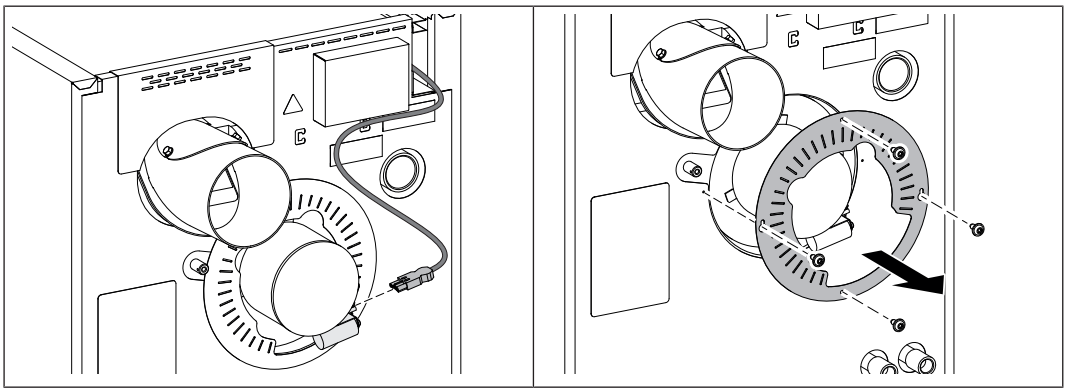
Checking the draught controller flap



❒ Check that the draught regulation damper moves freely and clean the flap bearing if necessary

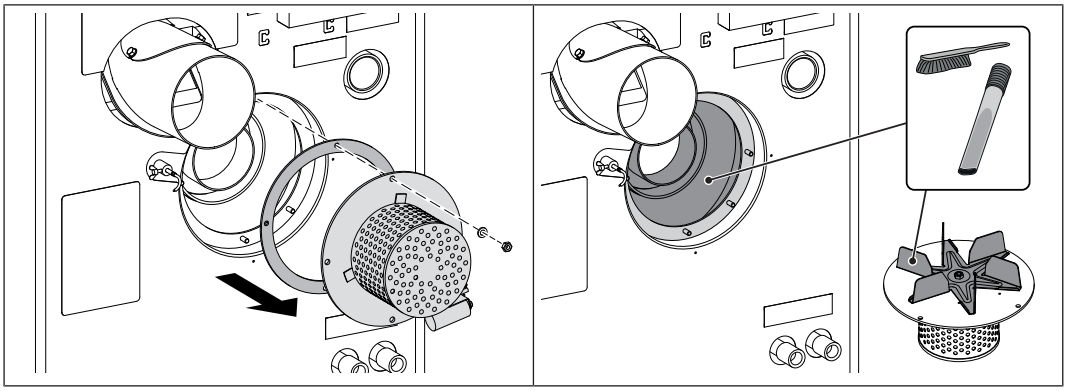
Clean the induced draught fan

IMPORTANT! Deposits on the running wheel may imbalance the induced draught, which can generate noise or, in the worst case scenario, lead to bearing damage.



❒ Unplug the connection cable of the induced draught fan

❒ Remove the cover plate for the ID fan



❒ Remove the induced draught fan and gasket

❒ Check the seal for damage and replace if necessary

❒ Clean the fan wheel from the inside out using a soft brush or paint brush

❒ Remove dirt and deposits from the induced draught housing using a scraper

❒ Remove any ash which has gathered using an ash vacuum

❒ Refit the induced draught fan and seal

❒ Fit the cover plate for ID fan and plug in the connecting cable

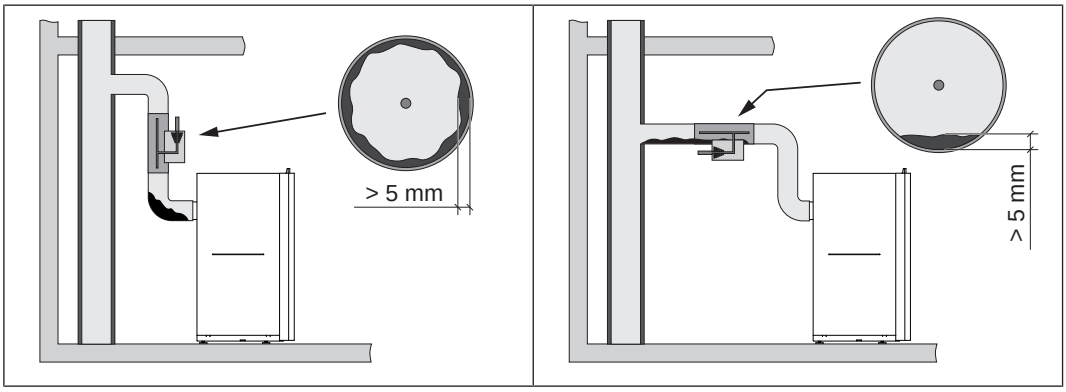
Check the heating water

❒ Unless specified otherwise by regional standards and regulations, perform an annual check on the heating water, ➲ "Domestic hot water" [▶ 21]

6.4.3 Maintenance of the electrostatic particle separator in the flue gas line (optional)

The electrostatic particle separator must be inspected and cleaned at appropriate intervals depending on the operating hours and fuel quality.

Inspection and cleaning must be repeated after no more than 300 operating hours or at least once a month. With less fuels of lower efficiency (for instance with a high ash content) this work needs to be carried out more frequently.



❒ Check the entire exhaust duct before and after the electrostatic particle separator for contamination

❒ If there are visible deposits larger than 5 mm, clean the flue gas line in accordance with the manufacturer's instructions for the electrostatic particle separator

6.5 Maintenance work by technicians

⚠ CAUTION

If maintenance work is carried out by untrained personnel:

Risk of personal injury and damage to property!

The following applies for maintenance:

❒ Observe the instructions and information in the manuals

❒ Only allow appropriately qualified personnel to work on the system

Only qualified staff are permitted to carry out maintenance work in this chapter:

- Heating technicians / building technicians
- Electrical installation technicians
- Froling customer services

The maintenance staff must have read and understood the instructions in the documentation.

IMPORTANT! We recommend a yearly inspection by Froling customer services or an authorised partner (third party maintenance).

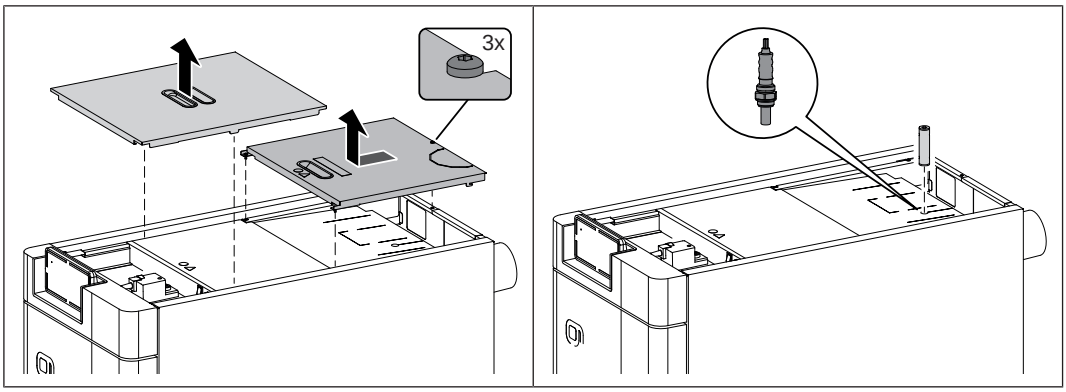
Regular maintenance and servicing by a heating specialist will ensure a long, trouble-free service life for your heating system. It will ensure that your system stays environmentally-friendly and operates efficiently and cost-effectively.
In the course of this maintenance the entire system is inspected and optimised, particularly regulation and control of the boiler. The emission measurement carried out can also be used to draw conclusions about the combustion performance of the boiler. For this reason, FROLING offers a service agreement, which optimises operating safety. Please see the details in the accompanying guarantee certificate.

Your Froling customer service office will also be happy to advise you.

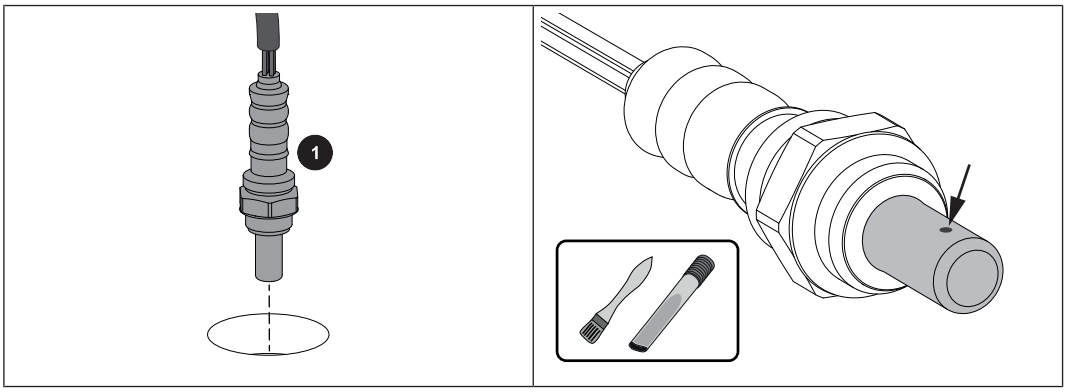
IMPORTANT

All national and regional regulations relating to regular testing of the system must be observed. Please be advised that, in Austria, commercial systems with a rated heat output of 50 kW or more must be regularly tested at yearly intervals in accordance with the Heating Plant Regulations (Feuerungsanlagen-Verordnung).

6.5.1 Cleaning the Lambda probe



❒ Remove the cover on the upper face of the boiler



❒ Carefully remove the lambda probe (1)

↳ Pay attention to the cables of the Lambda probe!

❒ Carefully remove impurities from the measuring ports with a fine brush and ash vacuum

↳ Hold the Lambda probe with the tip downwards so that deposits can fall out of the measuring ports

CAUTION:

- Do not clean the Lambda probe with compressed air
- Do not use chemical cleaning agents (brake cleaner, etc.)
- Handle the Lambda probe carefully, i.e. do not “tap” it or use a wire brush to clean it

6.6 Emissions measurement by chimney sweep or regulatory body

Various legal regulations stipulate that heating systems must be inspected periodically. In Germany this is regulated by the First Federal Emissions Protection Ordinance (BimSchV) in the last amended version, and in Austria by various state laws.

The following minimum requirements must be met by the operator of the system for a successful measurement:

❒ Ensure there is adequate fuel

↳ Only use fuels of high quality which meet the requirements as stipulated in the boiler operating instructions (“Permitted fuels” chapter)

❒ Ensure that there is adequate heat consumption on the day of the measurement (e.g. storage tank must be able to take heat for the duration of the measurement)

❒ There must be a suitable measuring port in the straight flue gas pipe for the measurement. The measuring port must be twice the flue gas pipe diameter away from the last upstream bend.

↳ If the measuring port is not correctly positioned, the measuring result will be distorted

↳ Refer to the information about the measuring port in the installation instructions for the boiler

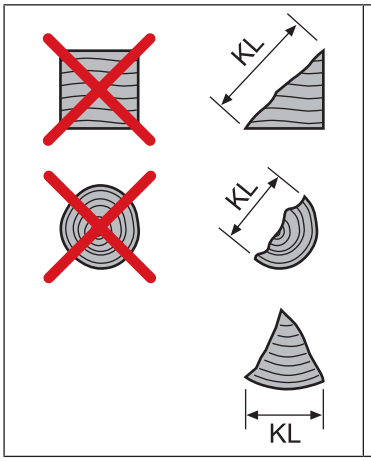
6.6.1 General information on measurement

Observe the following basic conditions:

❒ Only use fuel permitted according to the operating instructions

↳ Ensure that the water content (w) is greater than 15% and less than 25%

❒ Use short split wood (edge length EL < 10 cm) to create the measuring conditions and for the measurement itself



Short split wood with an edge length EL < 10 cm

The term “short split wood” has been defined in these instructions by Froling; there is no fuel standard or similar guidelines for this.

❒ The fuel must be dry, clean and uncontaminated (not painted, glued, etc.)

❒ The combustion process must not be interrupted during the measurement
Interruptions to the combustion process include:
- Opening the boiler doors
- Stoking the burning material
- Switching off the ID fan (e.g. because of inadequate heat consumption)

6.6.2 Create the measurement conditions and perform the measurement

- ❒ Fill the boiler approx. 1/4 full with small pieces of split wood in accordance with the operating instructions and heat up
  - ↳ TIP: The smaller the wood is split, the better and faster the bed of embers forms
- ❒ Ensure that the operating conditions are fulfilled
  - ↳ Return temperature min. 60 °C, boiler temperature min. 70 °C, chimney draught in the range of 8-10 Pa
- ❒ Allow the fuel to burn off until a basic firebed is achieved
  - ↳ This will take at least one hour depending on the fuel used and the power consumption
- ❒ Open the fuel loading door, distribute the embers evenly with the furnace tool and gauge the height of the embers
  - ↳ The top row of holes in the combustion chamber guards must be visible
- ❒ Close the fuel loading door

Once the basic firebed has been achieved (top row of holes visible in the combustion chamber guards, the two lower rows of holes of the combustion chamber guards are covered with embers):

- ❒ With the doors closed, press the chimney sweep button (boiler with button display) or activate chimney sweep function (boiler with touchscreen) and select the menu item “FW nominal load”
  - ↳ The boiler temperature setpoint will be automatically set to 85°C for the duration of the measurement
  - ↳ All of the configured heating circuits will be activated at maximum flow temperature for the duration of the measurement
- ❒ Open the fuel loading door and fill the boiler with the maximum permitted amount of fuel
  - ↳ If the boiler has activated reload calculation, the amount of fuel required will be shown on the screen
- ❒ Close the doors and wait approx. 10 minutes until the combustion process is under way
- ❒ Take the measurement at the designated measuring port
  - ↳ The ready-to-measure state is shown on the display
  - ↳ Regularly check the that the conditions are stable:
    - Boiler temperature > 70 °C
    - Flue gas temperature around 170 °C

6.7 Replacement parts

With Froling original replacement parts in your system, you are using parts that match perfectly. As the parts fit together so well, installation times are shortened and a long service life is maintained.

IMPORTANT

Installing non-original parts will invalidate the guarantee.

❒ Only replace components or parts with original replacement parts.

6.8 Disposal information

6.8.1 Disposal of the ash

Austria: ❒ dispose of ash in accordance with the Waste Management Act (AWG)

Other countries: ❒ dispose of ash in accordance with local regulations

6.8.2 Disposal of system components

❒ Ensure that they are disposed of in an environmentally friendly way in accordance with waste management regulations in the country (e.g. AWG in Austria)

❒ You can separate and clean recyclable materials and send them to a recycling centre.

❒ The combustion chamber must be disposed of as builders' waste.

7 Troubleshooting

7.1 General fault with power supply

Error characteristics	Cause of error	Elimination of error
Nothing is shown on the display	General power failure	
No power to the controller	Main switch is turned off	Turn on the main switch
	FI-protective circuit breaker, power line protection or SPS power line protection tripped	Switch on the protective circuit breaker

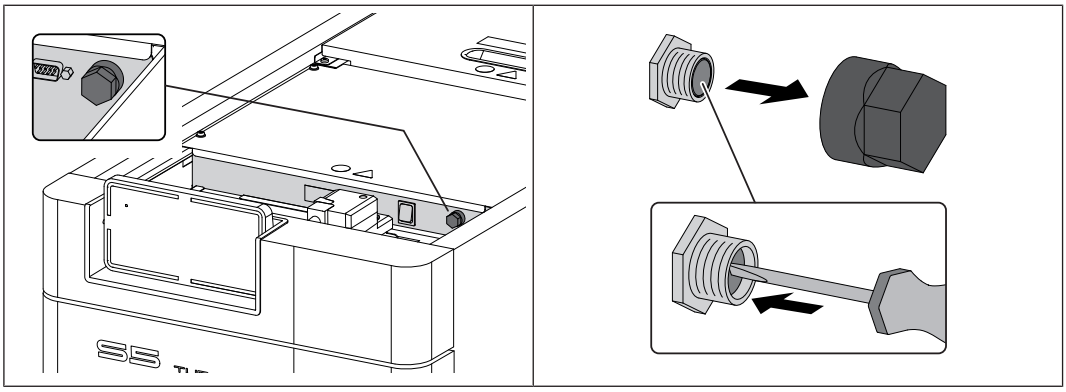
7.1.1 Behaviour of system after a power failure

Once the power supply has been restored, the boiler cleaning process is started and the previously set operating mode is then resumed.

- ❒ **After a power failure, check whether the STL has tripped**
- ❒ **Keep the doors of the boiler closed during and after the power failure, at least until the induced draught fan automatically starts up again.**

7.2 Excessive temperature

The high-limit thermostat (STL) switches off the blower fan at a maximum boiler temperature of 105 °C. The pumps continue to run.



Once the temperature falls to below approx. 75 °C, the STL can be mechanically unlocked

- ❒ Unscrew the cap on the STL
- ❒ Unlock the STB by pressing with a screwdriver

7.3 Faults with fault message

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

❒ The status LED indicates the type of fault
- Flashing yellow: Warning
- Flashing orange: Fault
- Flashing red: Alarm

❒ A fault message is shown on the display

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

WARNING	If a warning is issued, the boiler initially continues controlled operation; this gives the opportunity to resolve the fault quickly and avoid a shutdown.
ERROR	The boiler follows the shutdown procedure and remains in "Off" operating status until the problem is resolved
ALARM	An alarm triggers an emergency stop of the system. The boiler shuts down immediately, the heating circuit controller and pumps remain active.

7.3.1 Procedure for fault messages

If a fault occurs on the boiler, it will be shown on the display.

If the fault is acknowledged, although it has not been rectified, the window with the associated fault can be reopened as follows:

Open error display

❒ Tap on the info icon in the menu bar

The error display lists all faults at that time

❒ Open by tapping the listed fault

❒ Tapping the "Read all & close" button takes you back to the basic screen

↳ After cleaning, the boiler is in the previously set operating mode

Notes

Manufacturer's address

Fröling Heizkessel- und Behälterbau GesmbH

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

Zweigniederlassung Aschheim

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

Froling srl

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

Froling SARL

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

Installer's address

Stamp

Froling customer services

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

www.froeling.com