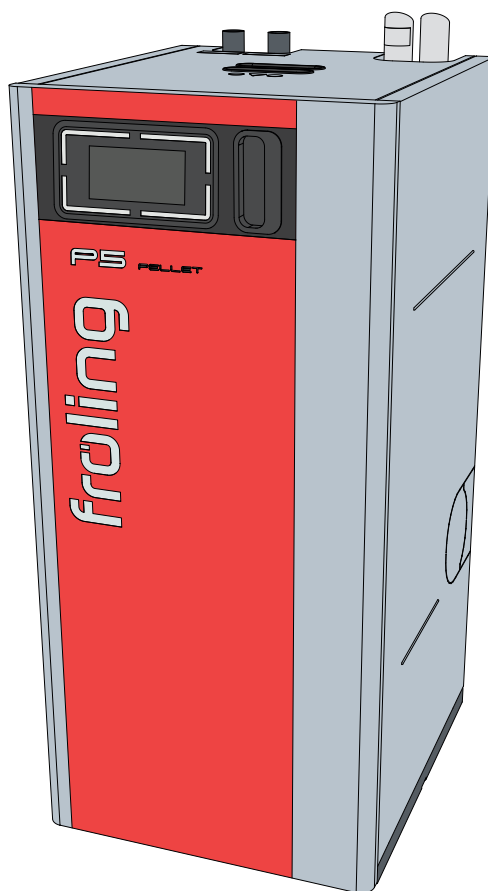


froling

Operating instructions

Pellet boiler P5 Pellet 12-40 (ESP)



Translation of original German version of operating instructions for operators!

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



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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.

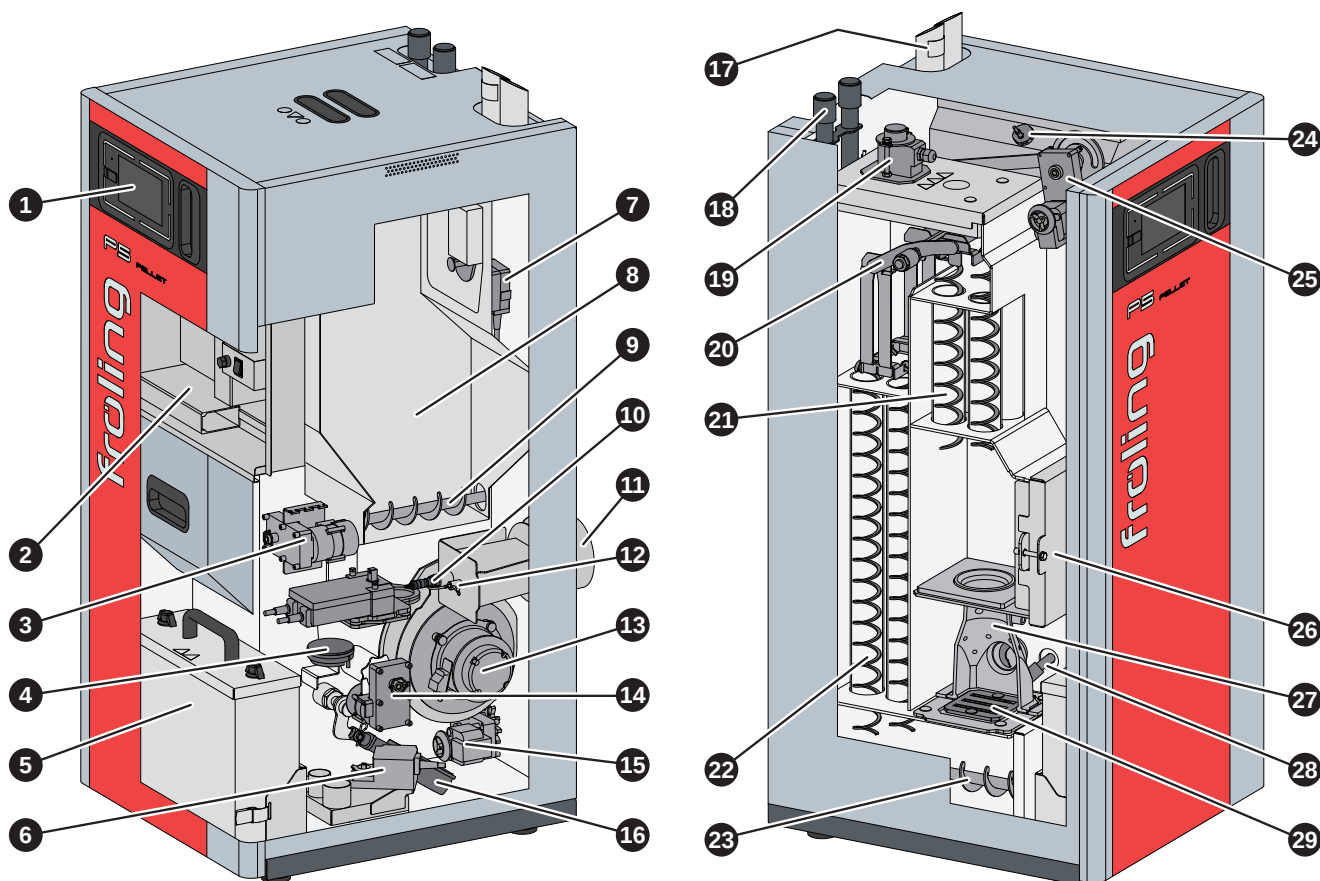
Subject to technical change.

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 Product overview Pellet boiler P5 Pellet 12-40



1	Lambdatronic 5000 control	16	Tipping grate drive
2	Boiler controller	17	Connections for pellet suction hoses
3	Feed screw drive	18	Flow and return connections
4	Differential pressure transmitter	19	Electrostatic particle separator (optional)
5	Ash container	20	WOS Efficiency Optimisation System
6	Air duct drive	21	Heat exchanger pipes for the 1st flue
7	Gate valve drive	22	Heat exchanger pipes for the 2nd flue
8	Pellet container	23	Ash removal
9	Feed screw	24	Fill level sensor of the pellet container
10	Lambda probe	25	WOS efficiency optimisation system drive
11	Flue gas pipe connection (optionally can be fitted at the side)	26	Combustion chamber cover
12	Flue gas temperature sensor	27	Combustion chamber
13	induced draught fan	28	Ceramic igniter
14	Stoker screw drive	29	Tipping grate
15	Ash removal drive		

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
	Always wear protective gloves		Turn off the main switch
	Keep the doors closed		Wear a dust mask
	Work under the supervision of a second person		Lock

	Unauthorised access prohibited		No fire, open flames or smoking
	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		Warning of injury to fingers or hands, automatic screw
	Warning of injury to fingers or hands, gear/chain drive		Warning of injury to fingers or hands, cutting edge
	Hand injury warning		Warning of injury from being pulled into rotating shafts
	Increased CO concentration warning		Slipping hazard warning

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 Fröling 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 Pellet boiler P5 Pellet 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 furnace 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.

2.4.2 Permitted fuels

Wood pellets

Wood pellets made from natural wood with a diameter of 6 mm

Note on standards

EU:	Fuel acc. to EN ISO 17225 - Part 2: Wood pellets class A1 / D06
and/or:	ENplus / DINplus certification scheme

General note:

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

TIP: Fit the Froling PST pellet deduster for separating the dust particles contained in the return air

2.4.3 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:

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!

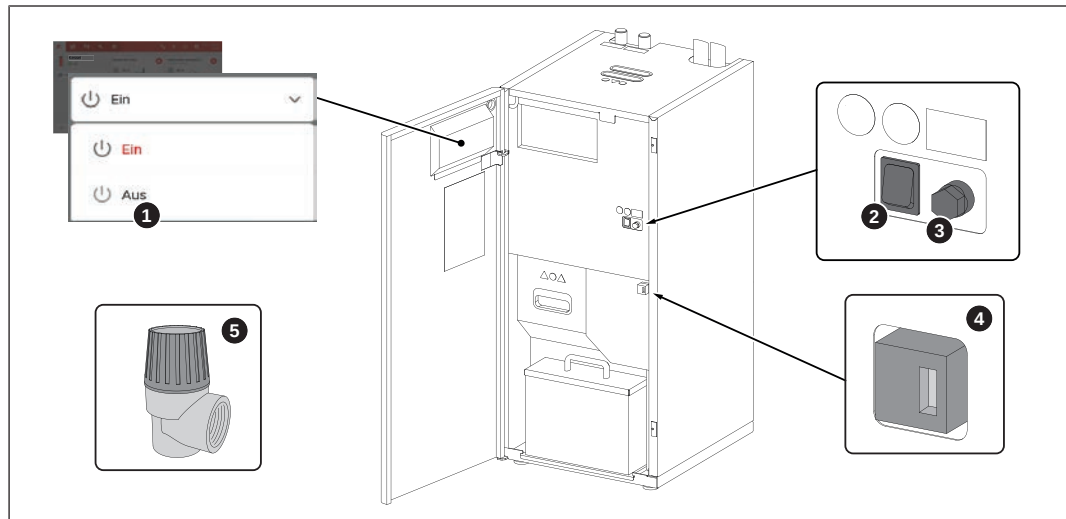


- For operation, inspection and cleaning:

- 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



1 **BOILER OFF** (switches off the boiler to prevent overheating)

☐ Tap "Boiler OFF"

- ↳ Automatic mode is switched off
- ↳ Control system follows the boiler shutdown procedure
- ↳ The pumps continue to run

2 **MAIN SWITCH** (switches off the power supply)

Before carrying out work on/in the boiler:

☐ Tap "Boiler OFF"

- ↳ Automatic mode is switched off
- ↳ Control system follows the boiler shutdown procedure

☐ Switch off the main switch and let the boiler cool down

3 **HIGH-LIMIT THERMOSTAT (STL)** (protection against overheating)

The STL (high-limit thermostat) switches off the combustion system when the boiler reaches 100°C. The pumps continue to run. Once the temperature falls below approx. 75°C, the STL can be reset mechanically.

4 **DOOR SWITCH** (protection against access to moving components)

If the insulated door opens while the boiler is operating, all of the units stop to prevent injuries at moving components. If the insulated door remains open for more than a specified time, the boiler automatically follows the shutdown procedure.

5 **SAFETY VALVE** (protection against overheating/excess pressure)

When a max. boiler pressure of 4 bar is attained, the safety valve opens and vents the heating water in the form of steam.

NOTE: Not included in delivery

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 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 ("Boiler 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 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 automatic boiler startup!

Before inspection and cleaning work in/on the boiler:



- ☐ Switch the boiler off by tapping "Boiler off"
The boiler follows the shutdown procedure and switches to "Boiler off" mode
- ☐ Allow the boiler to cool for at least 1 hour
- ☐ Switch off the main switch and take precautions to prevent accidental switching on

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 be fatal!



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

- ☐ Keep all the doors on the boiler closed
- ☐ Shut down the boiler according to procedure
- ☐ Ventilate the room where the boiler is installed
- ☐ Close the fire door and doors to living areas

Recommendation: Do not install smoke alarms and carbon monoxide detectors near the system.

2.9.3 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

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.

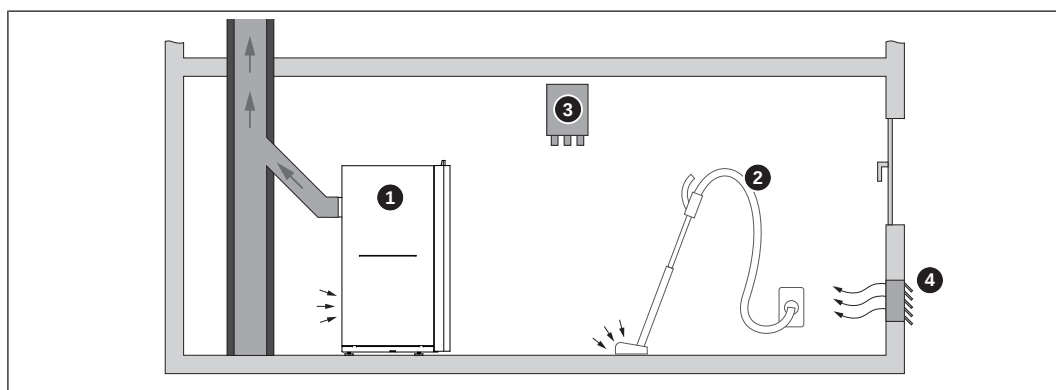
The boiler is operated either dependent on room air (combustion air is taken from the installation site) or independent of room air (direct combustion air supply via a separate pipe from outside).

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

Examples

Nominal heat output [kW]	Minimum free cross-section [cm ²]									
	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

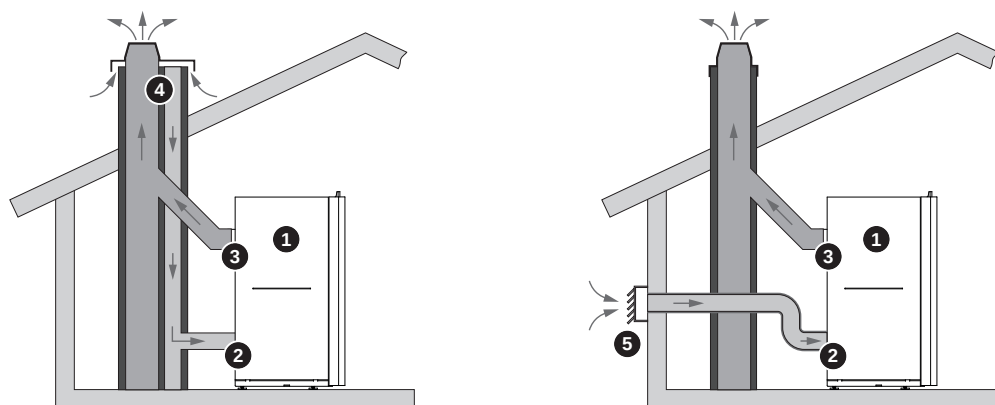
Austria:	OIB Guideline 3 - Hygiene, health and environmental protection
Germany:	Model Firing Ordinance (MFeuV)

3.3.3 Room air-independent operation (RIO)

General requirement

The combustion air is supplied to the boiler via a separate duct from the outside of the building. The supply must be dimensioned so that the total pressure drop at nominal load does not exceed 20 Pa.

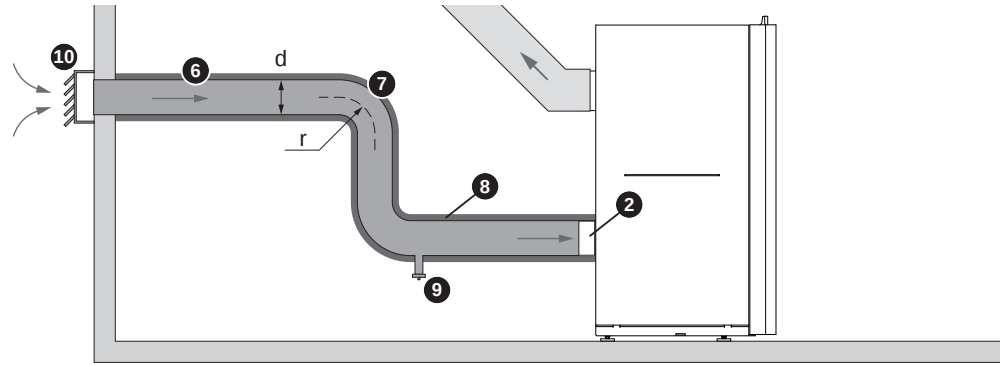
Ventilation of the installation site must be ensured by free or mechanical ventilation under the condition that no impermissible under-pressure greater than 4 Pa is created at the installation site.



- | | |
|---|---|
| 1 | Boiler in room air-dependent operation |
| 2 | Combustion air connection at the boiler |
| 3 | Flue gas line connection at the boiler |
| 4 | Supply air duct via system exhaust system (LAS) |
| 5 | Supply air duct from the outside |

The boiler has a central combustion air connection (2) to which the supply air duct is connected with a leak-tight joint. The combustion air can be supplied from the draught of a system flue gas system (4) or directly from the outside of the building via a separate supply air duct (5).

Supply air line



Observe the following instructions when installing the combustion air supply (duct):

- If necessary, have the pressure drop in the combustion air supply (6) calculated by a specialist
(resistance in the supply air duct max. 20 Pa)
- For dimensions of the combustion air connection (2) on the boiler, see chapter "Technical data"
IMPORTANT: Do not reduce the dimensions of the connection
- In the duct, use bends (7) with the largest possible ratio (≥ 1) of radius of curvature (r) to duct diameter (d)
- Use as few bends as possible (7) in the duct
Recommendation:
 - up to 5 m duct length: max. 5 pipe bends
 - up to 10 m duct length: max. 3 pipe bends
- The supply air duct should be as straight as possible and take the shortest path
- Insulate the supply air duct with suitable thermal insulation (8) to prevent formation of condensation
- Lay the supply air duct with a gradient to the outside so that condensate can drain off.
If required, install a condensate trap (9) at the lowest point
- Provide suitable protective devices (e.g. protective grille - 10) to prevent the ingress of water, foreign bodies or small animals. The cross-section must not be narrowed as a result.
- Do not close or obstruct the inlet opening
- Ensure the duct is stable at a range of temperatures (up to 120 °C)
- Install the supply air pipe so that it is protected against mechanical damage

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/m ³ (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 Storage tank

In principle it is not necessary to use a storage tank for the system to run smoothly. However we recommend that you use the system with a storage tank, as this ensures a continuous supply of fuel in the ideal output range of the boiler.

For the correct dimensions of the storage tank and the line insulation (in accordance with ÖNORM M 7510 or guideline UZ37) please consult your installer or Fröling.

Certain subsidy guidelines prescribe compulsory requirements for the installation of storage tanks. Up-to-date information about individual subsidy guidelines can be found at www.froeling.com.

Requirements for Switzerland in accordance with LRV Appendix 3, section 523

Automatic boilers for wood pellets with a rated thermal output of more than 70 kW must be equipped with a heat accumulator of a volume of at least 25 litres per kW rated thermal output. These dimensioning specifications apply up to 500 kW nominal heat output.

Hot water tank in accordance with Commission Regulation (EU) 2015/ 1189 (Ecodesign Requirements)

It is recommended to operate the boiler with a hot water tank. The recommended storage volume = $20 \times P_r$, where P_r is the rated heat output and is indicated in kW.

3.7 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

- 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

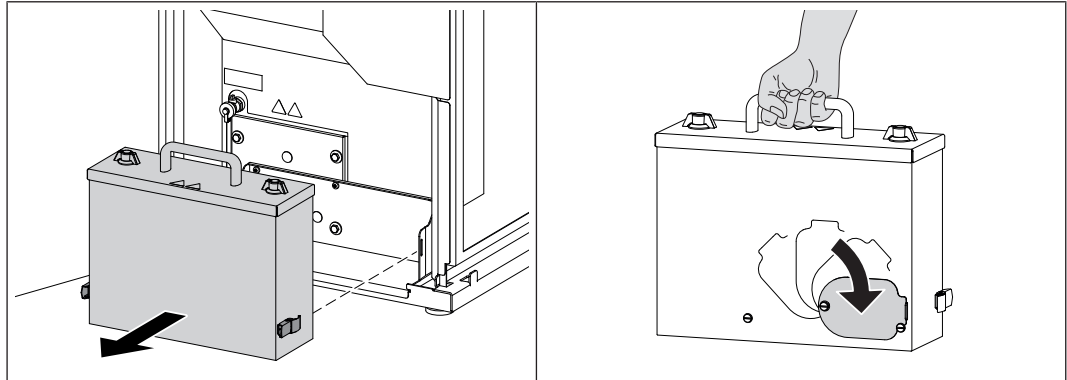


- ☐ Turn on the main switch
 - ↪ There is voltage at all of the boiler's components
 - ↪ When the control has completed the system start, the boiler is ready for operation

4.3 Empty the ash container

The ash container must be emptied at appropriate intervals depending on energy requirements and fuel quality.

The message "Ash box full, please empty it" appears on the boiler display.



- ☐ Switch off the boiler by tapping on "Boiler off" and leave it to cool down for at least one hour
- ☐ Open the front door and remove the ash container
- ☐ Close the opening at the rear with the sliding valve and transport the ash container to the emptying point

4.4 Switching off the power supply

WARNING

When turning off the main switch in automatic mode:

Serious combustion faults leading to serious accidents are possible.

Before turning off the main switch:

- ☐ Switch boiler off by tapping "Boiler OFF"
 - ↳ The boiler follows the shutdown procedure and switches to "Boiler off" status after the cleaning cycle

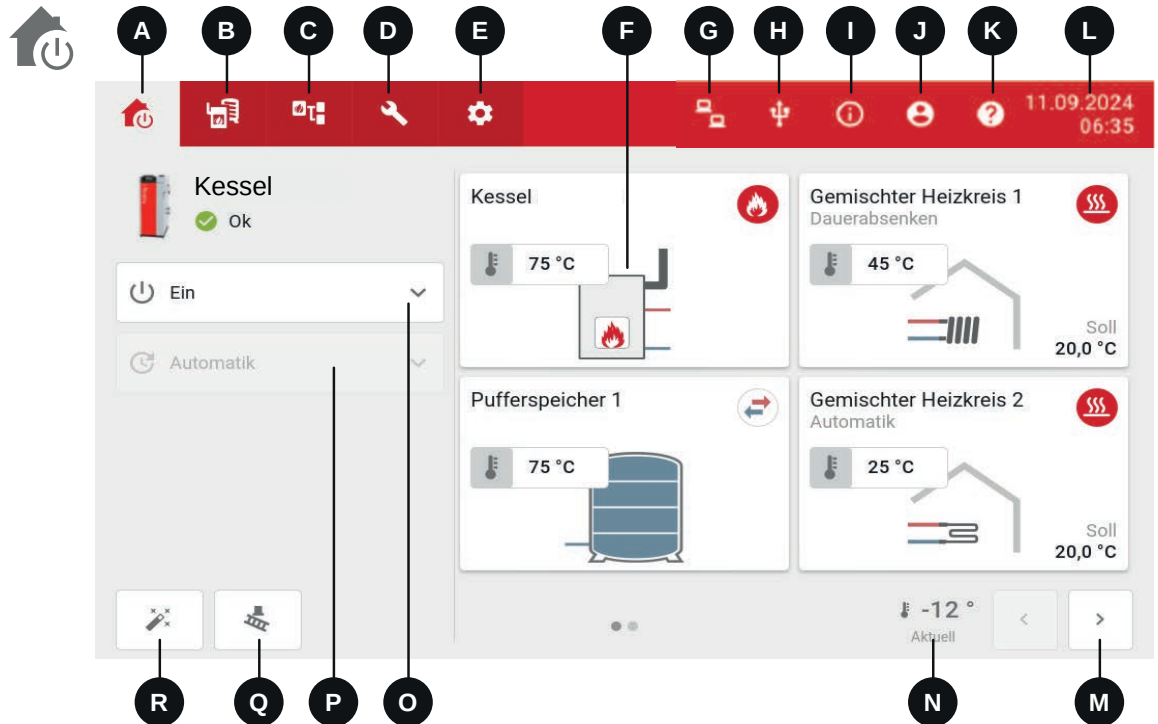


- ☐ Turn off the main switch
 - ↳ Boiler controller is switched off
 - ↳ There is no power supply to any of the boiler components

IMPORTANT! Frost protection function is no longer active!

5 Operate the boiler using the touch display

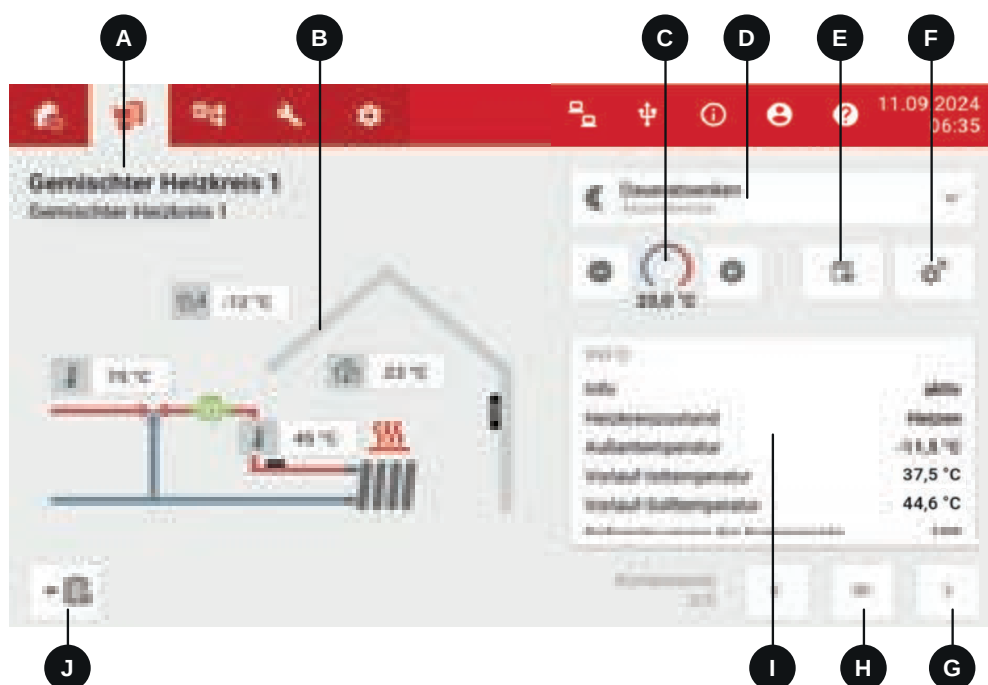
Basic display



- | | |
|----------|--|
| A | Basic display
➔ "Basic display" [► 30] |
| B | Overview of the individual components
➔ "Components" [► 31] |
| C | Display of the system diagram
➔ "System diagram" [► 34] |
| D | Menu for maintenance and diagnostics
➔ "Maintenance & diagnostics" [► 34] |
| E | Call up the system settings. All parameters can be displayed and/or edited depending on the user's rights
➔ "Settings" [► 34] |
| F | Display of freely selectable information
➔ "Change information displays" [► 30] |
| G | Display symbol when using Fröling Connect
➔ "Connect status" [► 34] |
| H | Display when a USB stick is plugged in
➔ "USB stick" [► 34] |
| I | Display of status messages and current values
➔ "System info" [► 35] |
| J | Displaying and changing the user level
➔ "User" [► 35] |
| K | Help menu to explain the current display |

	➔ "Help menu" [▶ 36]
L	Displaying and changing the current date/time ➔ "Setting the date and time" [▶ 36]
M	Switch to next page
N	Current outside air temperature
O	Switching the boiler on/off
P	Display of the current operating status
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	To the previous or next component
H	Overview of all components with direct dialling
I	Overview of all current values
J	Display of source or consumers of the component with direct selection

5.1 Status display



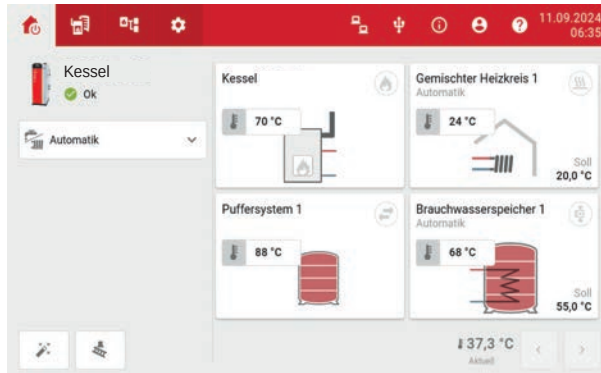
The LED frame (A) on the boiler controller indicates the current system status.

- 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

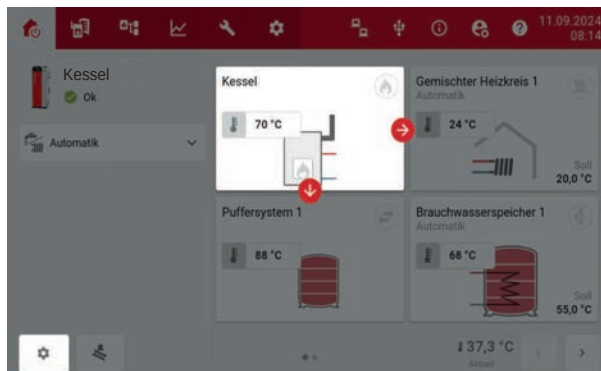


The first page of the basic screen shows an overview of the heat source and the dashboard. All visible components and their most important values are listed here. The display and position of the components can be customised. Several pages are available, between which you can switch using the swipe gesture 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

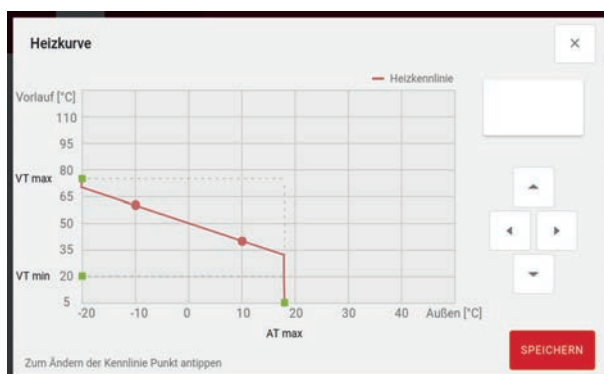


Adjusting the heating characteristic

- ☐ 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:

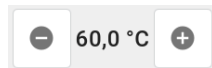
The heating curve is defined with 60°C (at -10°C outside air temperature) and 40°C (at +10°C outside air temperature). If for example the current outside temperature is -2°C, this would result in a calculated flow temperature of 52°C. The two values together define the heating curve and should not be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

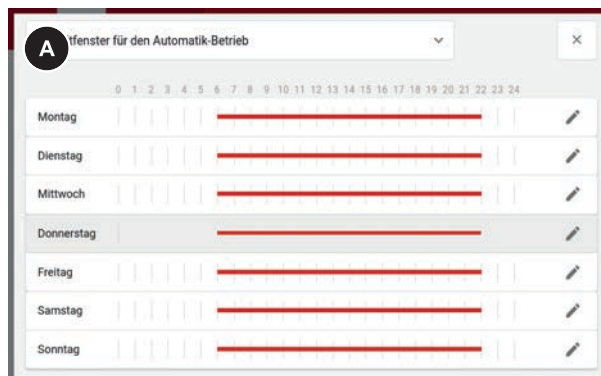
- ☐ Tap in the area of the component designation
- ☐ Enter the desired designation and confirm it

5.4.4 Changing times

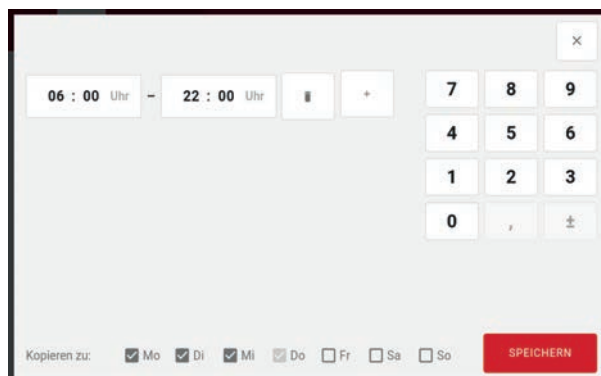


Different timed programs can be set in the component overview depending on the component and authorisation.

- ☐ 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



Configurator



System diagram

- ☐ 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 Maintenance & diagnostics



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

5.7 Settings



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

5.8 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.

5.9 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 an IBN file, this can be transferred to the system. IMPORTANT! Current settings are overwritten! Prior export of the current system image is recommended.
	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.

5.10 System info



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

5.11 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.

5.11.1 Operating level with USB stick

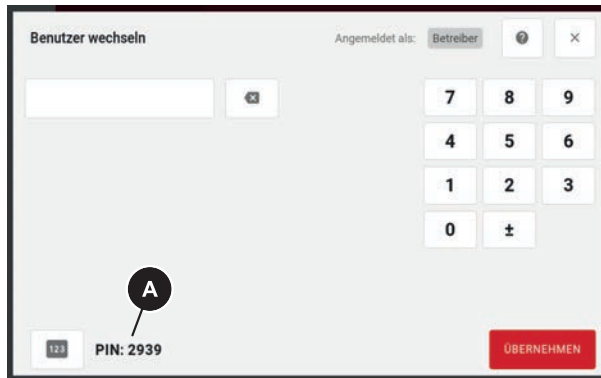
A USB stick with a licence file is required to switch to the “Service” user level. The required file is available in the Fröling partner area for authorised users.

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.

5.11.2 Operating level with one-time password

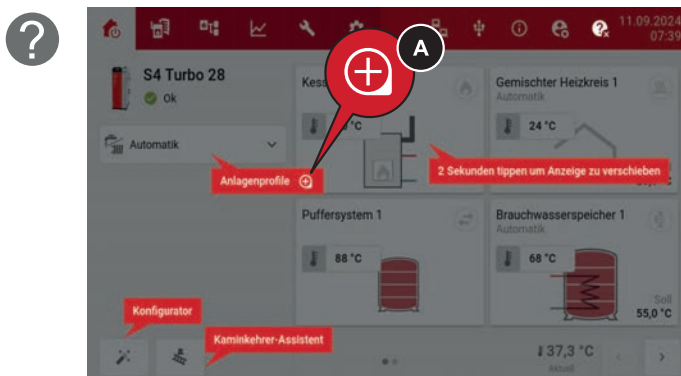
If no USB stick with a licence file is available, the one-off password can be entered to switch to the “Service” user level, if required.

- ☐ 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

5.12 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.

5.13 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



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

Serious injuries possible due to automatic boiler startup!

Before inspection and cleaning work in/on the boiler:



- ☐ Switch the boiler off by tapping "Boiler off"
The boiler follows the shutdown procedure and switches to "Boiler off" mode
- ☐ Allow the boiler to cool for at least 1 hour
- ☐ Switch off the main switch and take precautions to prevent accidental switching on

WARNING



During inspection and cleaning work on the hot boiler:

Hot parts and the flue gas pipe can cause serious burns!

Take the following precautions:



- ☐ It should be standard practice to wear protective gloves when working on the boiler.
- ☐ Only operate the boiler using the handles provided
- ☐ Before starting work, switch off the boiler and allow it to cool down for at least 1 hour

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:

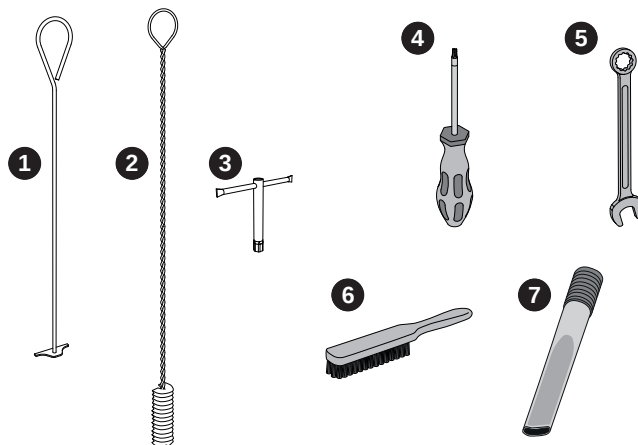
- ☐ Clean the boiler following the instructions in the instruction manual. Follow the boiler operating instructions.

IMPORTANT

We recommend that you keep a maintenance book in accordance with ÖNORM M7510 of the Technical Directive for Fire Prevention (TRVB)

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	Cleaning brush Ø54 x 1350
3	SW 13 mm socket wrench

Not included:

4	Screwdriver set (Philips, slot head, Torx T20, T25, T30)
5	Spanner or box wrench set
6	Small broom or cleaning brush
7	Ash vacuum

6.3 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..

6.3.1 Weekly 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!**

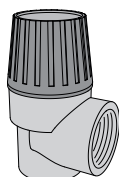
If the system pressure decreases:

- ☐ 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:

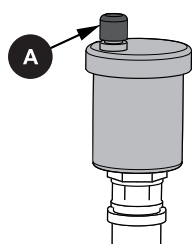
- ☐ Ask an expert to inspect the expansion tank

Checking the 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

IMPORTANT! The vent cap (A) must be loose (screw on approx. two revolutions) to ensure correct functioning.

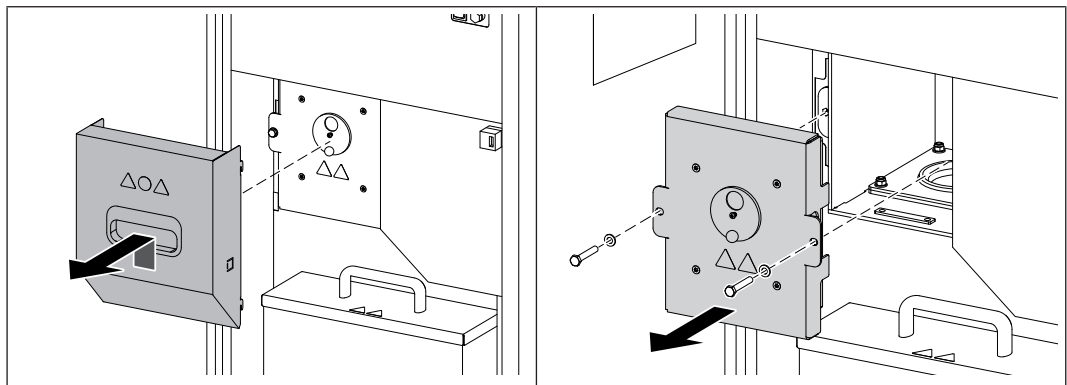
6.3.2 Periodic inspection and cleaning

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

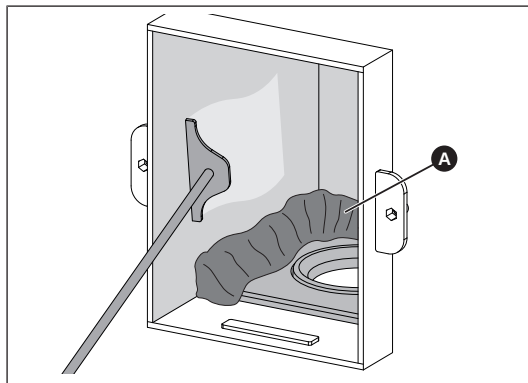
Inspection and cleaning must be repeated after not more than 2500 operating hours or at least once a year. For less efficient fuels (e.g. high ash content) this work needs to be carried out more frequently.

Cleaning the combustion chamber

- ☐ Switch off the boiler by tapping "Boiler OFF"
- ☐ Allow the boiler to cool for at least one hour
- ☐ Activate service mode



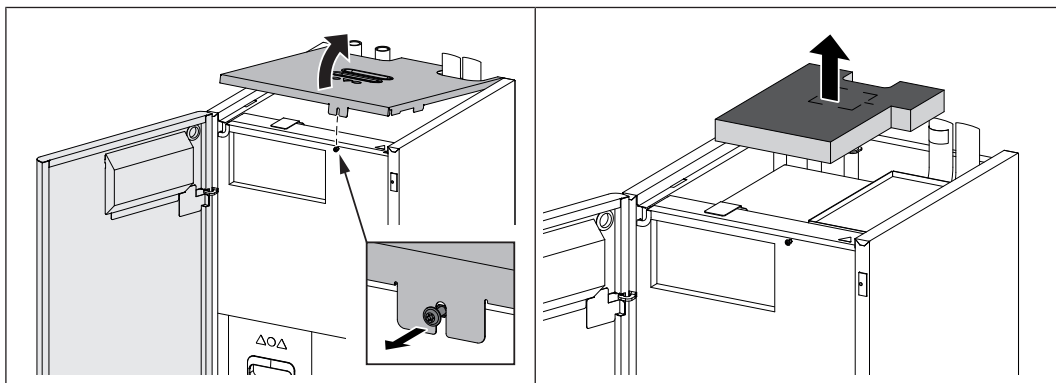
- ☐ Open the front door and un hinge the cover behind it upwards
- ☐ Use the box wrench to unscrew and remove the combustion chamber cover
- 2 x M8 x 50 hexagon head screws



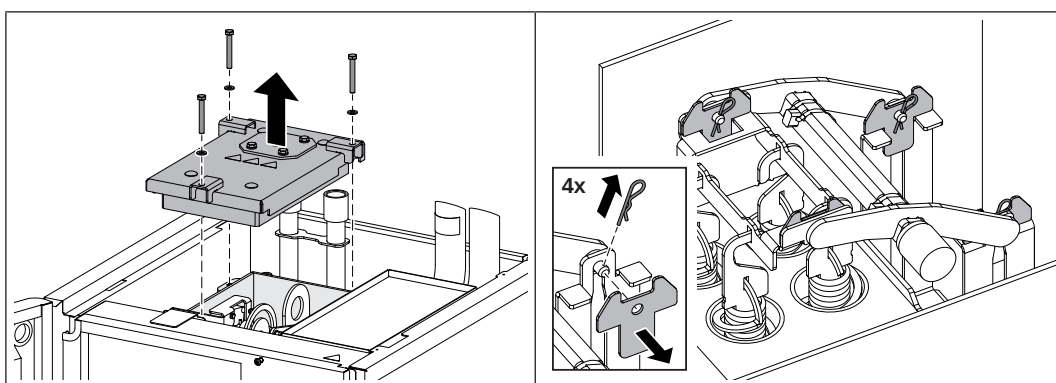
- ☐ Remove ash cone (A) in the combustion chamber with a brush
- ☐ Remove deposits on the walls with a flat scraper and clean the combustion chamber with an ash vacuum cleaner

Clean the heat exchanger and WOS springs (for boilers without ESP)

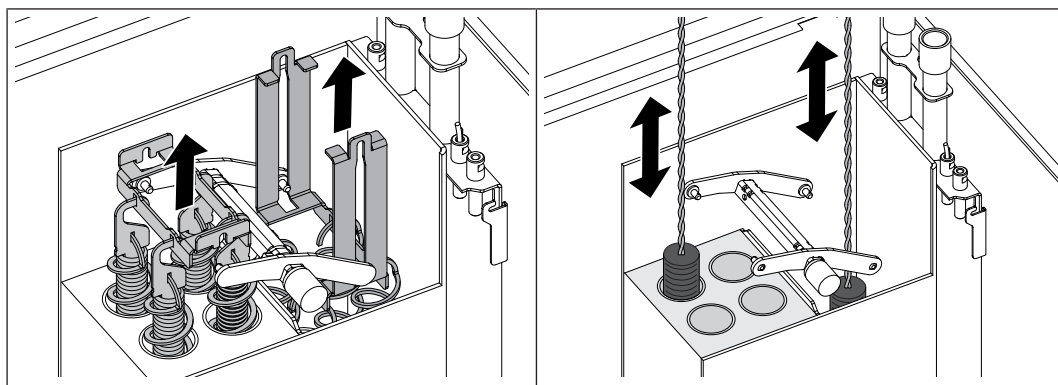
- ☐ Switch off the boiler by tapping “Boiler OFF”
- ☐ Allow the boiler to cool for at least one hour
- ☐ Activate service mode



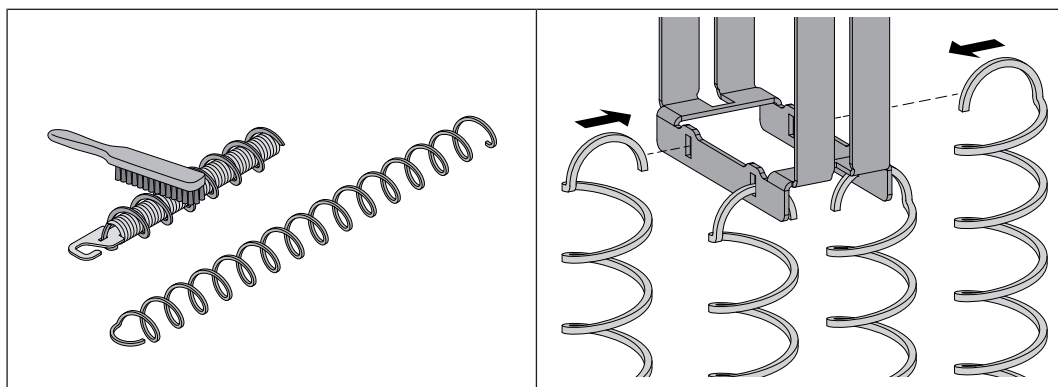
- ☐ Open the front door
- ☐ Loosen the retaining screw on the front and remove the cover upwards
 - 1x M5 x 25 lens-head screw
- ☐ Remove the thermal insulation from the top



- ☐ Remove the heat exchanger cover
 - 3 x M8 x 60 hexagon head screws
- ☐ Pull out the four spring cotter pins from the heat exchanger lever and remove the locking plates



- ☐ Pull the suspension plates including the heat exchanger springs out of the heat exchanger
- ☐ Clean the entire flue gas collection chamber using an ash vacuum
- ☐ Clean WOS pipes with Ø54 x 1350 cleaning brush



- ☐ Clean the WOS springs with a stainless steel brush
- ☐ After cleaning from the outside, hook the WOS springs into the cut-outs in the mounting plate

Clean the heat exchanger, WOS springs and electrode (for boilers with ESP)

DANGER



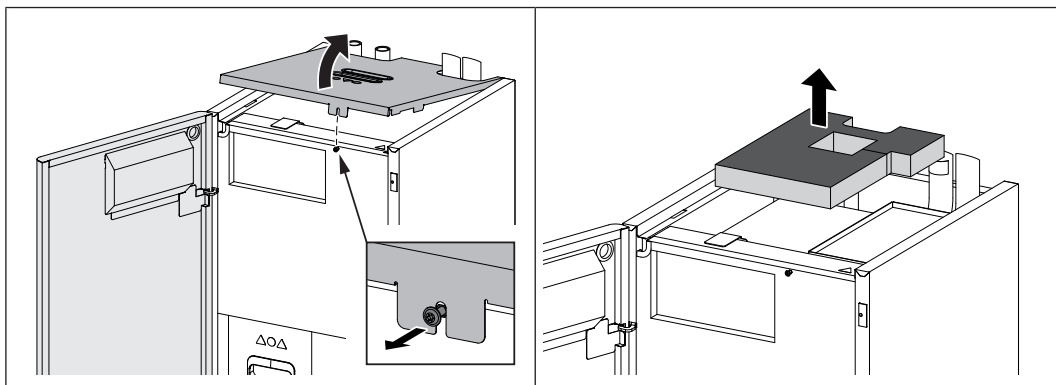
If maintenance work is performed when the system is in operation:

Risk to life from high voltage electrodes!

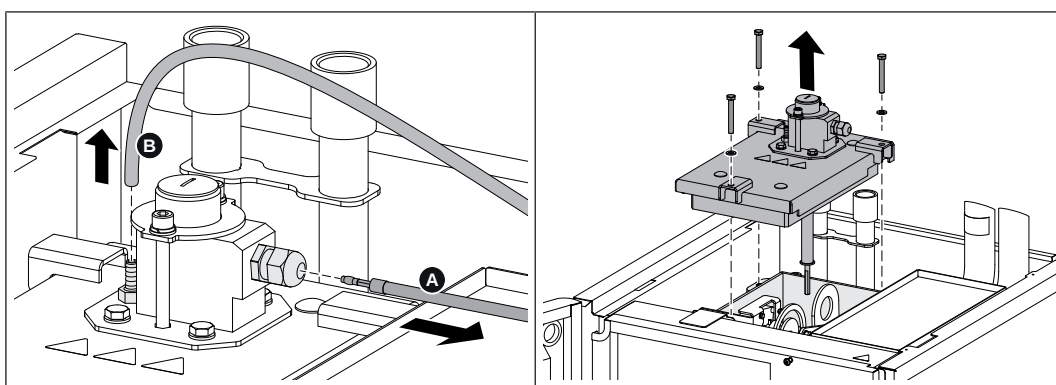
Prior to working on the electrostatic particle separator, ensure the following:

- ☐ 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

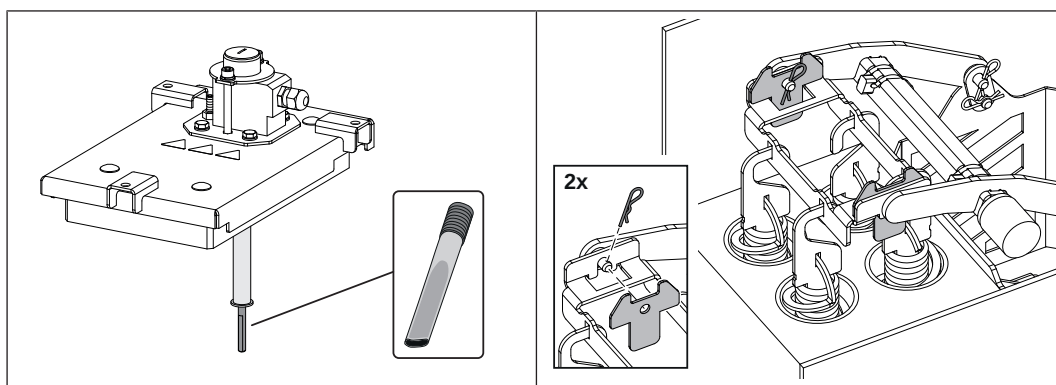
- ☐ Switch off the boiler by tapping "Boiler OFF"
- ☐ Allow the boiler to cool for at least one hour
- ☐ Activate service mode



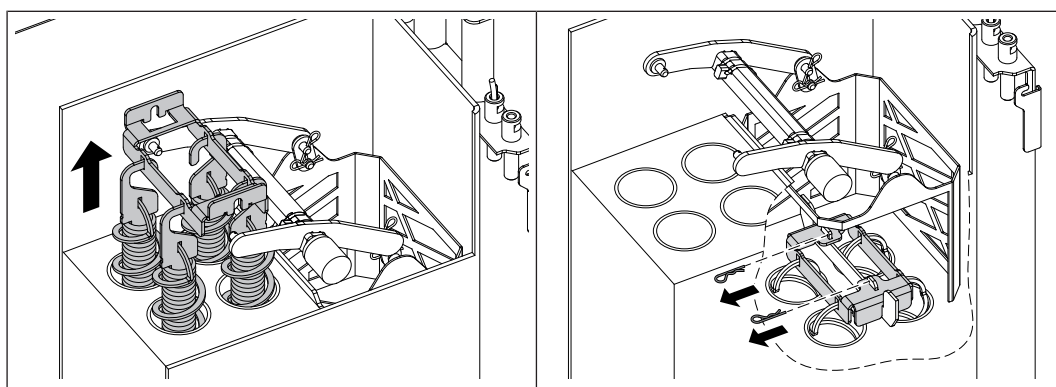
- ☐ Open the front door
- ☐ Loosen the retaining screw on the front and remove the cover upwards
 - 1x M5 x 25 lens-head screw
- ☐ Remove the thermal insulation from the top



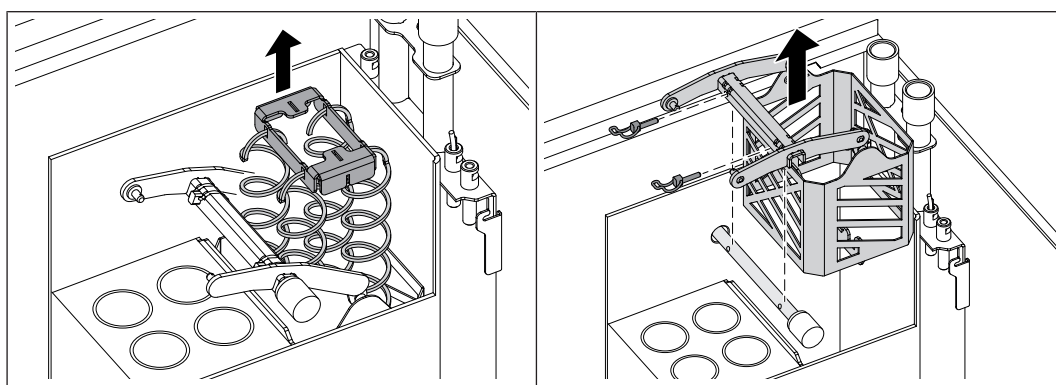
- ☐ Disconnect the HV cable (A) and silicone hose (B - for ambient air-independent operation) from the electrode
- ☐ Remove the heat exchanger cover
 - 3 x M8 x 60 hexagon head screws



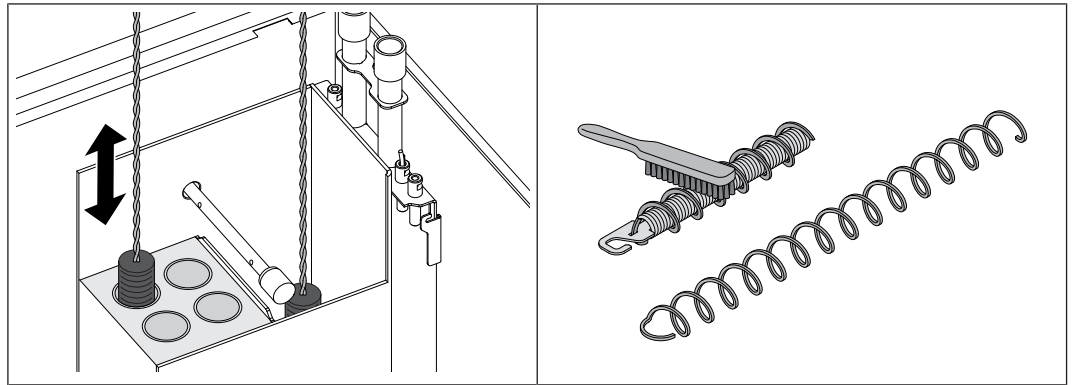
- ☐ Remove soot and deposits from the electrode and insulator
 - ↳ Use an ash vacuum
- ☐ Pull out the two spring cotter pins from the heat exchanger lever and remove the locking plates



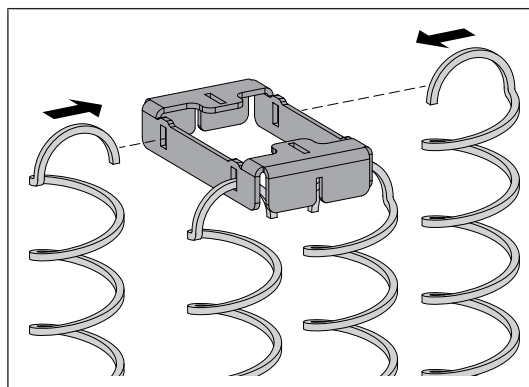
- ☐ Pull the front suspension plates including the heat exchanger springs out of the heat exchanger
- ☐ Pull out two spring cotter pins on the rear suspension plate



- ☐ Pull the rear suspension plates including the heat exchanger springs out of the heat exchanger
- ☐ Remove two pipe locking pins and pull the lever including cleaning basket out of the heat exchanger

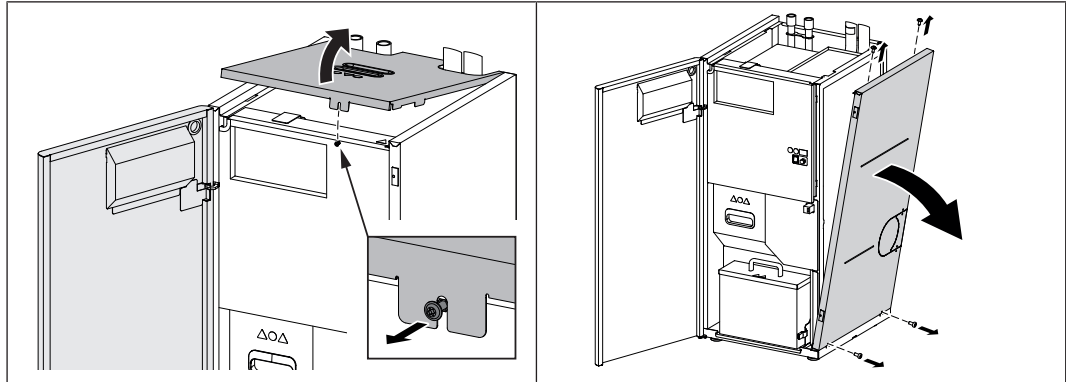


- ☐ Clean the entire flue gas collection chamber using an ash vacuum
- ☐ Clean WOS pipes with Ø54 x 1350 cleaning brush
- ☐ Clean the WOS springs and basket with a stainless steel brush

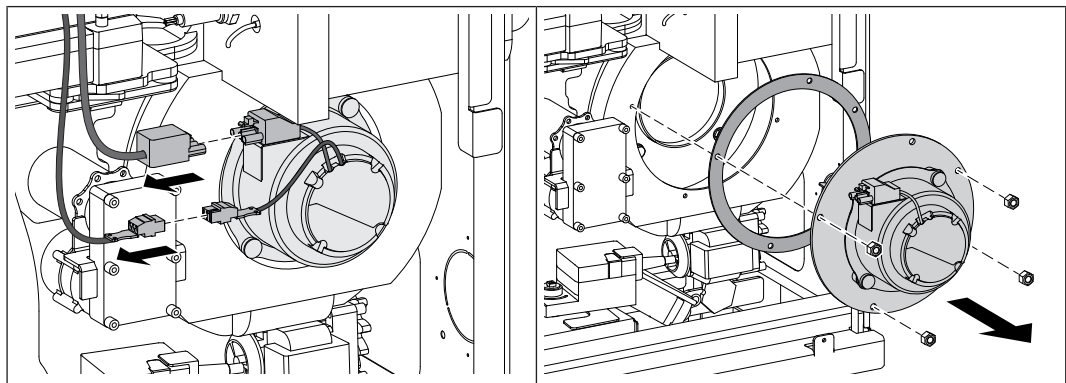


- ☐ After cleaning from the outside, hook the WOS springs into the cut-outs in the mounting plates
- ☐ After cleaning, install all of the WOS components by the same operations in reverse order
- ☐ **IMPORTANT:** The HV cable plug must engage noticeably on the electrode

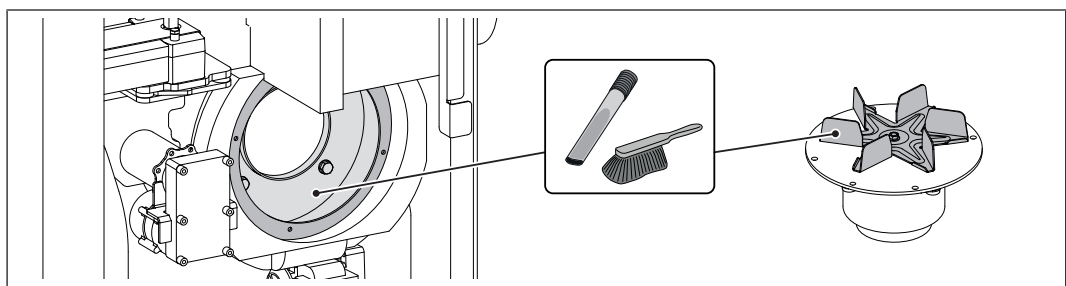
Clean the induced draft fan



- ☐ Open the front door
- ☐ Loosen the retaining screw on the front and remove the cover upwards
 - 1x M5 x 25 lens-head screw
- ☐ Remove the right side panel
 - 2x M4 x 10 lens-head screws at the top
 - 2x M5 x 10 lens-head screws on the underside

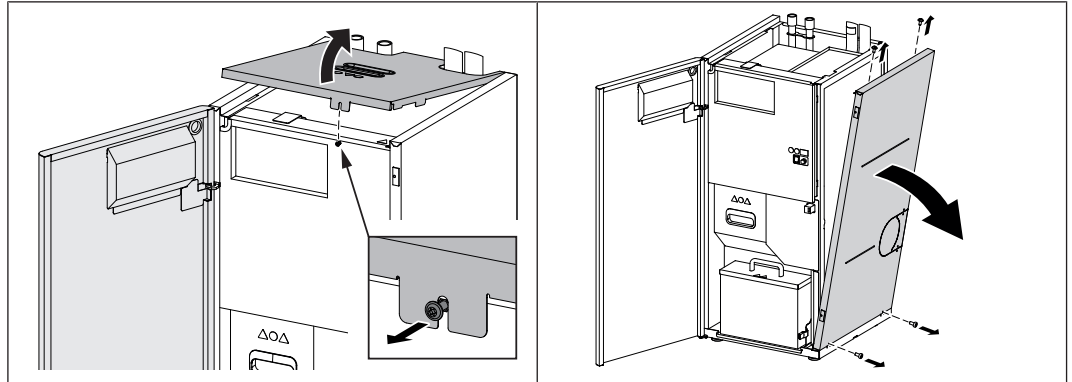


- ☐ Remove the plug from the induced draught fan
- ☐ Remove the induced draught fan and gasket
 - 4 x M6 hexagonal nuts
- 🔧 Check the gasket for damage and replace it if necessary

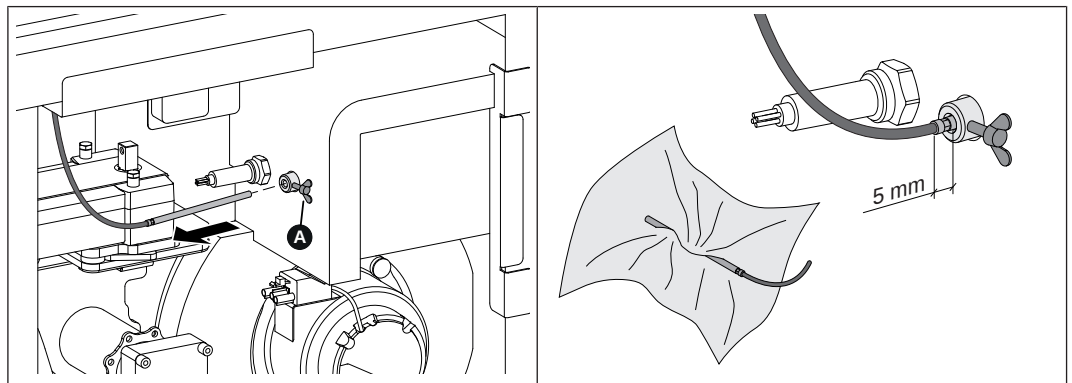


- ☐ Clean the fan wheel from the inside out using a soft brush or paint brush
- ☐ Remove contaminants and deposits from the induced draught unit housing

Clean the flue gas temperature sensor



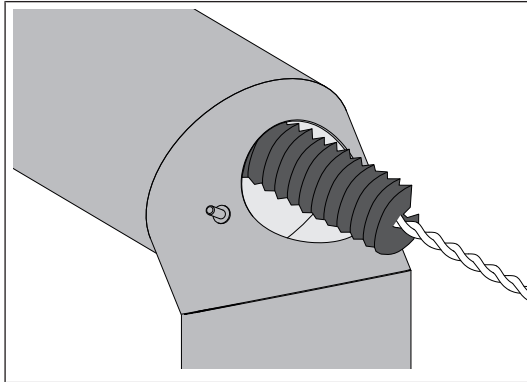
- ☐ Open the front door
- ☐ Loosen the retaining screw on the front and remove the cover upwards
 - 1x M5 x 25 lens-head screw
- ☐ Remove the right side panel
 - 2x M4 x 10 lens-head screws at the top
 - 2x M5 x 10 lens-head screws on the underside



- ☐ Undo the wing screw (A) and take out the flue gas temperature sensor
- ☐ Wipe the flue gas temperature sensor with a clean cloth
- ☐ Push in the flue gas temperature sensor so that approx. 5 mm protrudes from the bushing

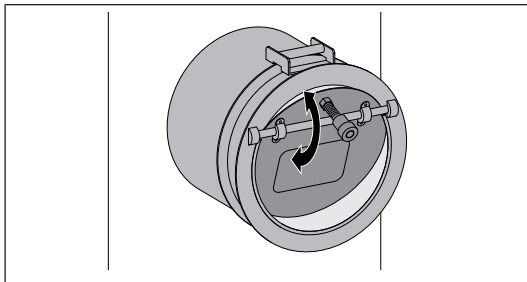
Cleaning the flue gas pipe

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.



- ☐ Remove the inspection cover on the connecting pipe
- ☐ 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

Checking the draught controller flap



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

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 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.

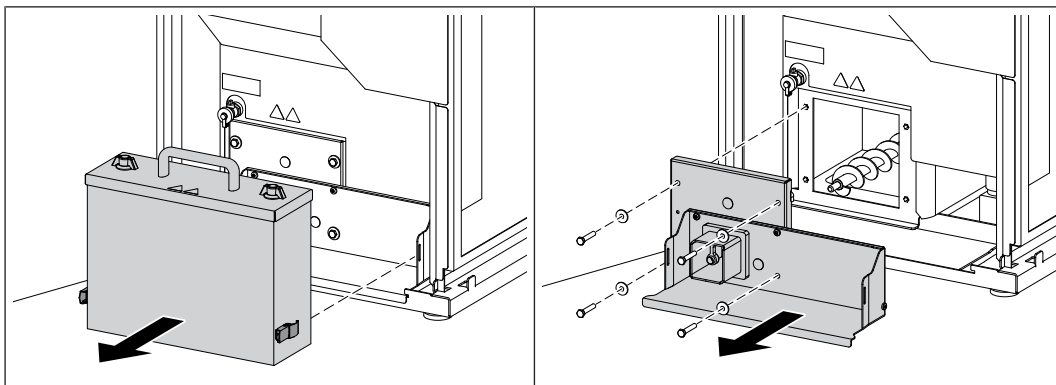
In the course of this maintenance the entire system is inspected and optimised, particularly regulation and control of the boiler. The emission measurement carried out can also be used to draw conclusions about the combustion performance of the boiler. For this reason, FROLING offers a service agreement, 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.

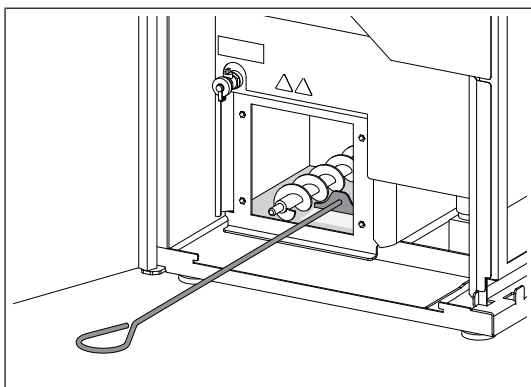
IMPORTANT

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).

6.4.1 Clean area under combustion chamber

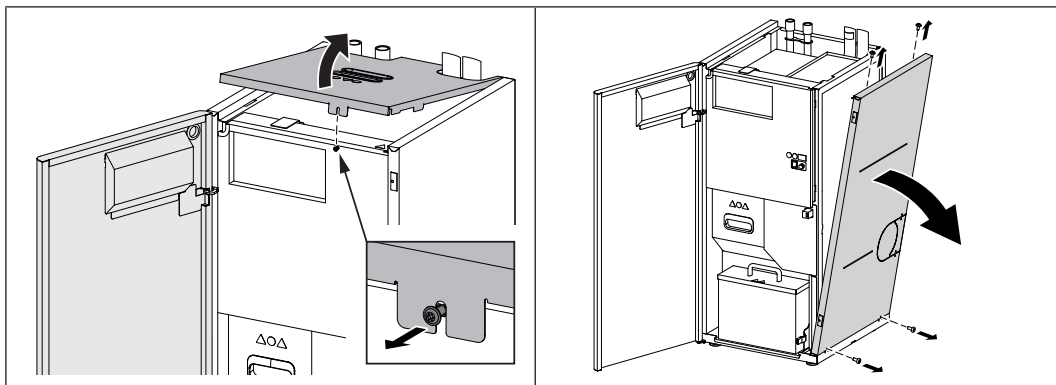


- ❑ Open the insulated door and remove the ash container
- ❑ Dismantling the ash removal bracket
 - 4x M8 x 45 hexagon head screws

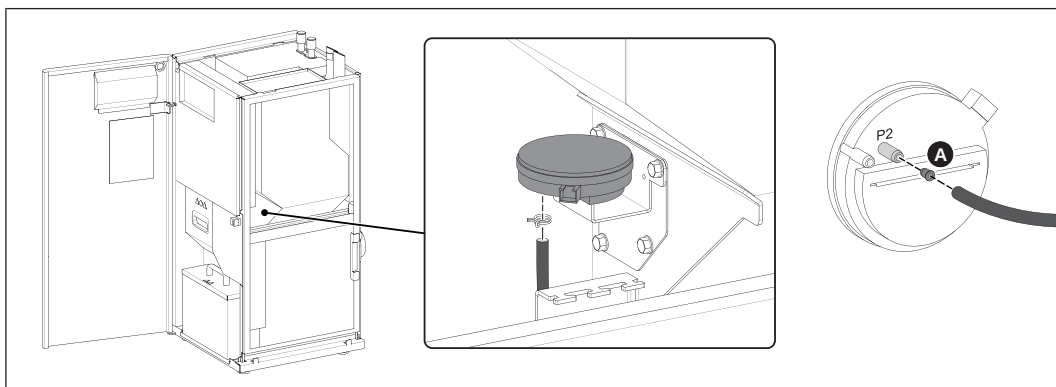


- ❑ Remove the ashes under the combustion chamber
 - ↳ Use a flat scraper and an ash vacuum cleaner

6.4.2 Cleaning the measurement line of the underpressure controller

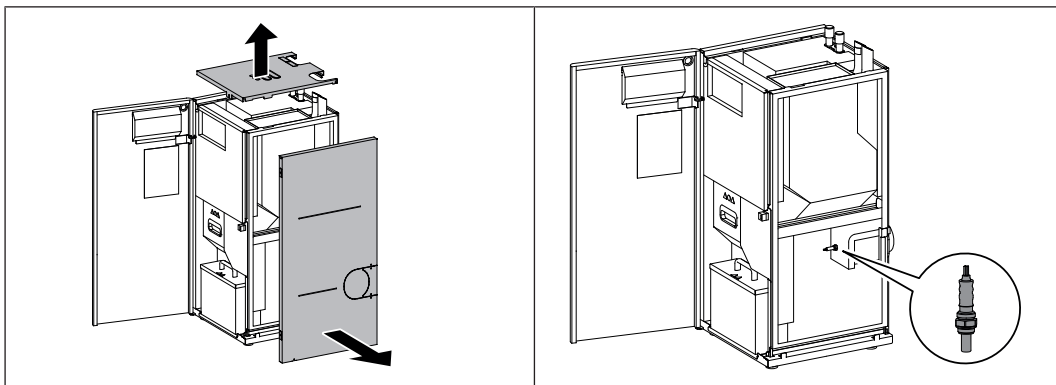


- ❑ Open the front door
- ❑ Loosen the retaining screw on the front and remove the cover upwards
 - 1x M5 x 25 lens-head screw
- ❑ Remove the right side panel
 - 2x M4 x 10 lens-head screws at the top
 - 2x M5 x 10 lens-head screws on the underside

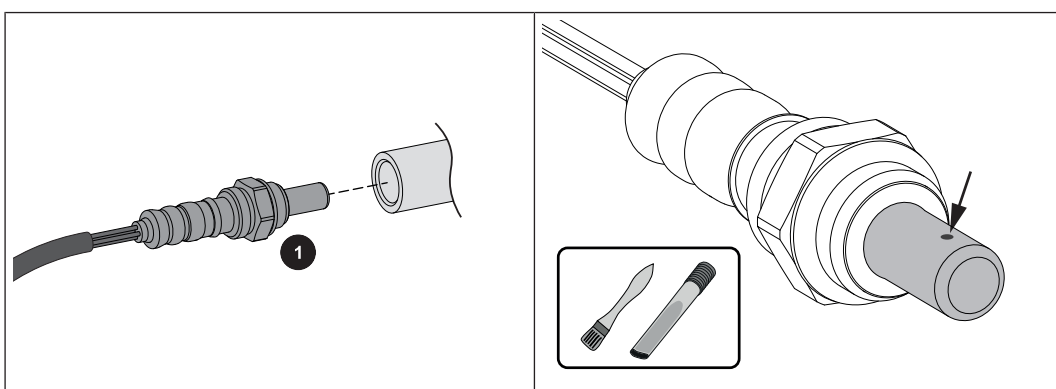


- ❑ Loosen the double wire clamp with pliers and remove the measurement line from the differential pressure transmitter
- ❑ Clean the measurement line with gentle compressed air
 - ⚠ **WARNING!** Do not direct compressed air into the differential pressure transmitter
- ❑ After cleaning, install measurement line to connection "P2"
 - ⚠ Make sure that reducing plug (A) is completely pushed into connection "P2"

6.4.3 Cleaning the Lambda probe



- ☐ Dismantle the top cover and right-hand side panel
- ☐ Disconnect the plug on the extension cable of the Lambda probe

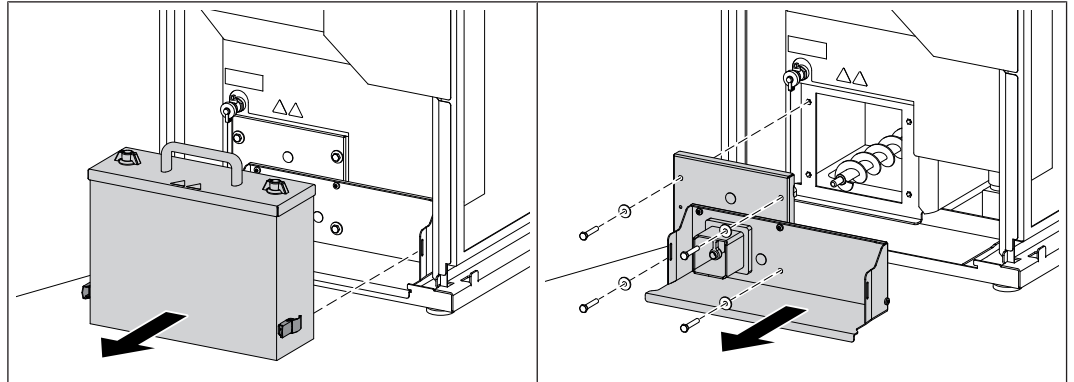


- ☐ Carefully remove the lambda probe (1)
 - ↳ Pay attention to the cables of the Lambda probe!
- ☐ Carefully remove impurities from the measuring ports with a fine brush and ash vacuum
 - ↳ Hold the Lambda probe with the tip downwards so that deposits can fall out of the measuring ports

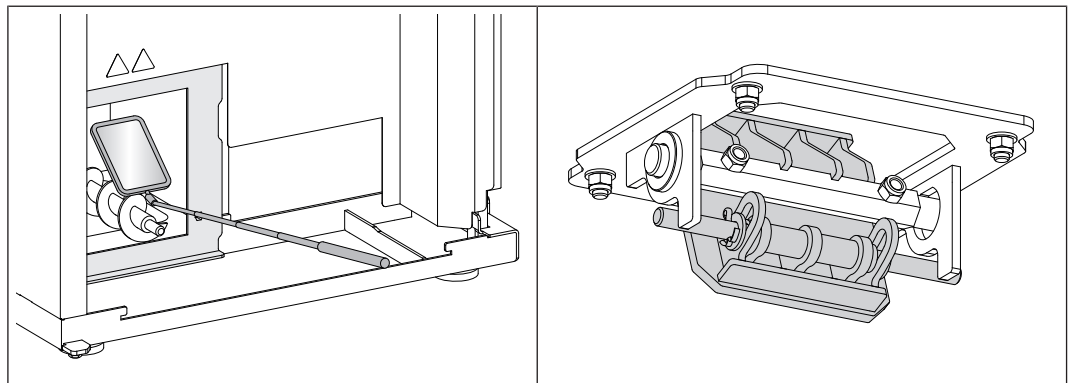
CAUTION:

- 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

6.4.4 Checking and cleaning the combustion grate



- ☐ Open the insulated door and remove the ash container
- ☐ Dismantling the ash removal bracket
 - 4x M8 x 45 hexagon head screws



- ☐ Check the combustion grate and clean it if necessary
 - ↳ **TIP:** Use a telescopic mirror for easier inspection

IMPORTANT! Small cracks and slight deformations on the combustion grate are not indicative of a fault.

6.5 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.

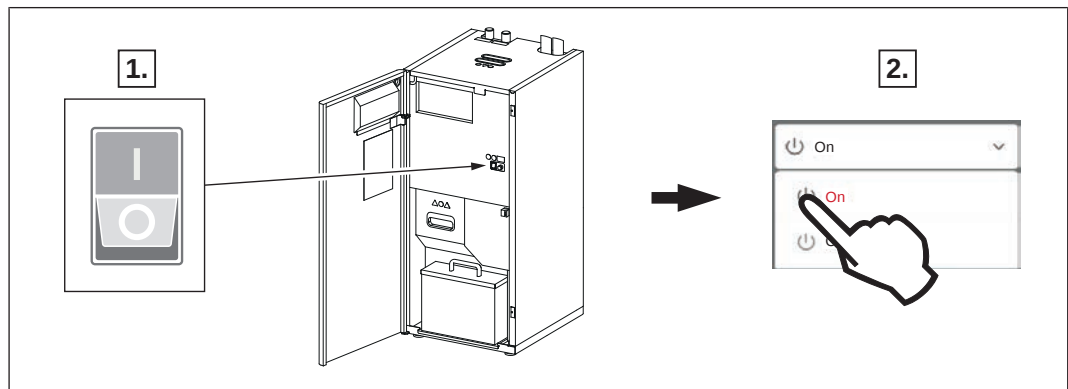
The following minimum requirements must be met by the operator of the system for a successful measurement:

- ☐ Clean the boiler immediately before the measurement in accordance with the instructions in the "Periodic inspection and cleaning" section of these operating instructions
- ☐ 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

6.5.1 Switch on the system

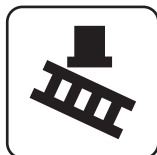
When the cleaning is complete:

- ☐ Reassemble all dismantled components in reverse order and check for tightness and correct installation



- ☐ Turn on the main switch
 - ↳ When the control has completed the system start, the boiler is ready for operation
- ☐ Switch the boiler on by tapping "Boiler ON"
 - ↳ Automatic mode is active. The heating system is controlled via the controller according to the selected mode in automatic mode

6.5.2 Start emissions measurement



☐ Activate the "Chimney-sweep mode" icon

☐ Select the desired time from the menu:

immediately	☐ Specify the type of measurement (nominal load / partial load) ↪ The flue gas temperature and residual oxygen content should have stabilised approximately 20 minutes after activation ↪ The display will indicate that the boiler is ready for measurement as soon as all the conditions for the measurement are fulfilled
Enter target date	☐ Enter the time of measurement (date and time) ↪ The boiler will follow the shutdown procedure before the start of the measurement according to the time lock and will not start up again until the set time ↪ IMPORTANT! The boiler starts 30 minutes before the start of the measurement and is already ready for measurement at the set time!

6.6 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.

6.7 Disposal information

6.7.1 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

6.7.2 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.

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 FI-protective circuit breaker, power line protection or SPS power line protection tripped	Turn on the main switch Switch on the protective circuit breaker

7.1.1 Behaviour of system after a power failure

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

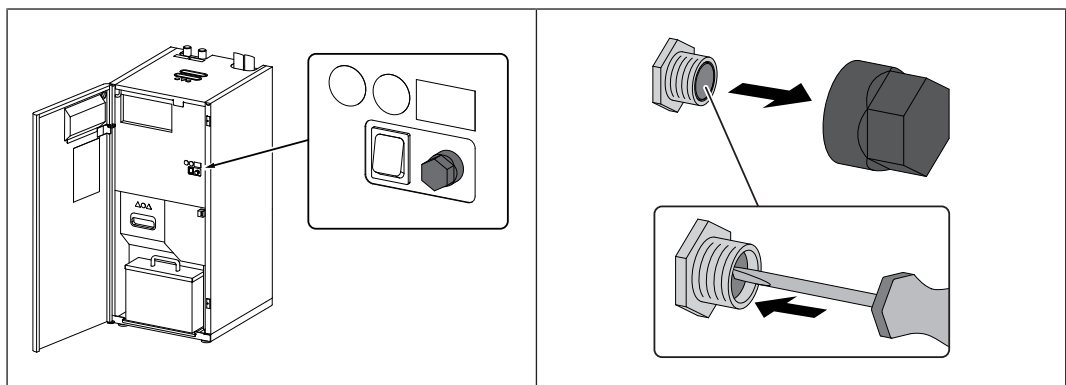
- ☐ After a power failure, check whether the STL (high-limit thermostat) has tripped.
- ☐ Keep the doors of the boiler closed during and after the power failure, at least until the induced draught fan automatically starts up again.

EXCEPTION:

If the boiler operating status was "Heating up", "Pre-heating" or "Ignition" before the power failure, the boiler follows the shutdown procedure and cleaning commences. Only then does the boiler switch to "Preparation" operating status and the system starts up again.

7.2 Excessive temperature

The high-limit thermostat (STL) shuts down the boiler when it reaches a temperature of max. 100°C. The pumps continue to run.



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

- ☐ Unscrew the cap on the STB (high-limit thermostat)
- ☐ Unlock the STL 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 "Boiler 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
 - ➞ The boiler is in the previously set mode

[illegible]

[illegible]

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