Owner´s Manual

P4 Pellet 8 - 100

Tested & Listed By O-T-L Portland Oregon USA
C US
OMNI-Test Laboratories, Inc.
Report #456-S-02-2
Do Not Remove or Cover This Label
Ne pas enlever ou recouvrir cette étiquette

TÜV AUSTRIA

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

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Table of Contents

1 Supplementary instructions

These instructions ensure safe and efficient use of the P4 Pellet (hereinafter referred to as the “system"). These instructions are a component part of the system and must be kept next to the system and within the immediate reach of staff at all times.

Staff must carefully read and understand these instructions before commencing all work. All the safety instructions and operating guidelines specified in this manual must be observed to ensure safety at work. In addition, the local accident prevention regulations and general safety regulations apply to the area of application of the system.

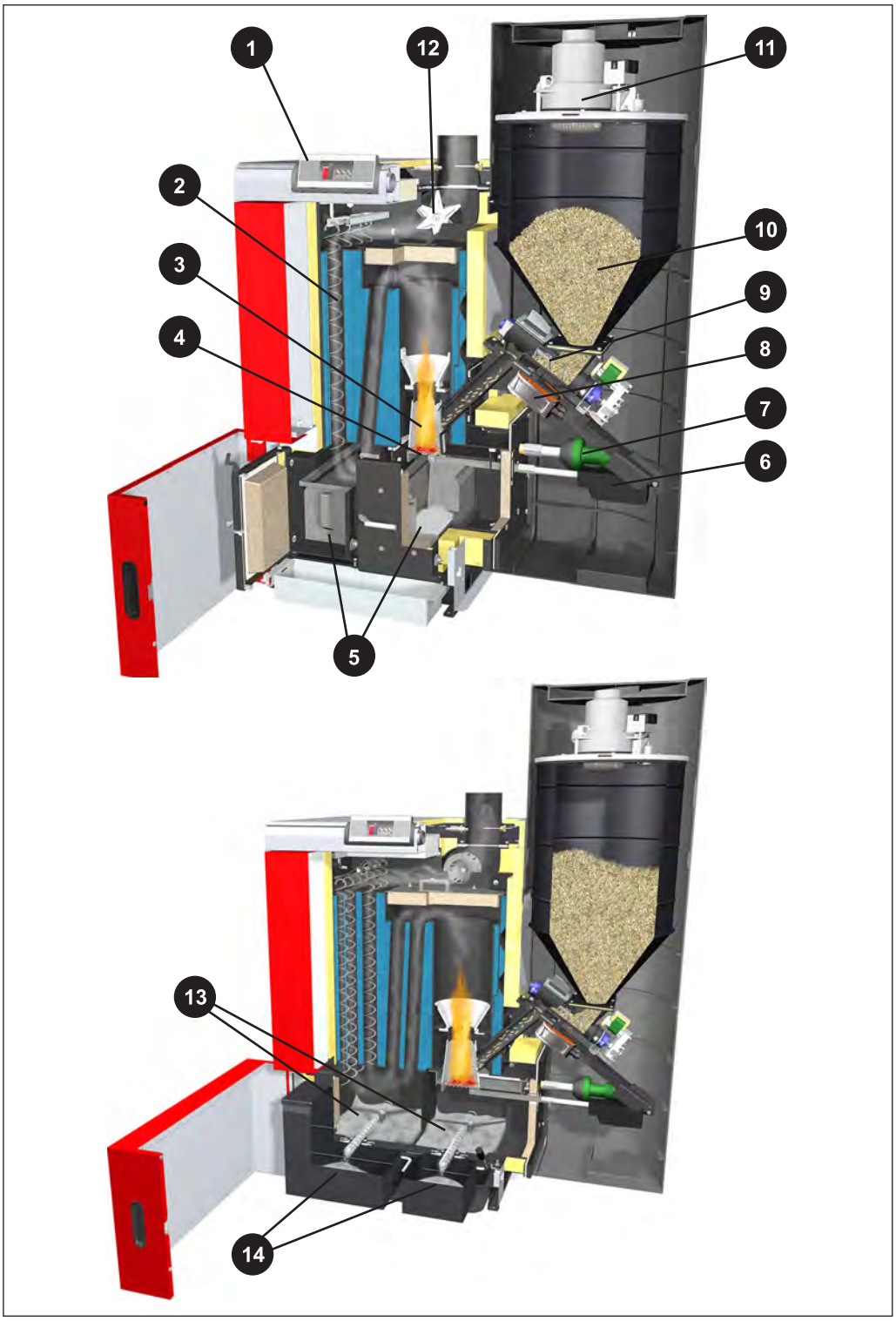
Images in these instructions are intended solely to aid understanding and may differ from the actual design.

NOTICE

SAVE THESE INSTRUCTIONS!

2 Overview

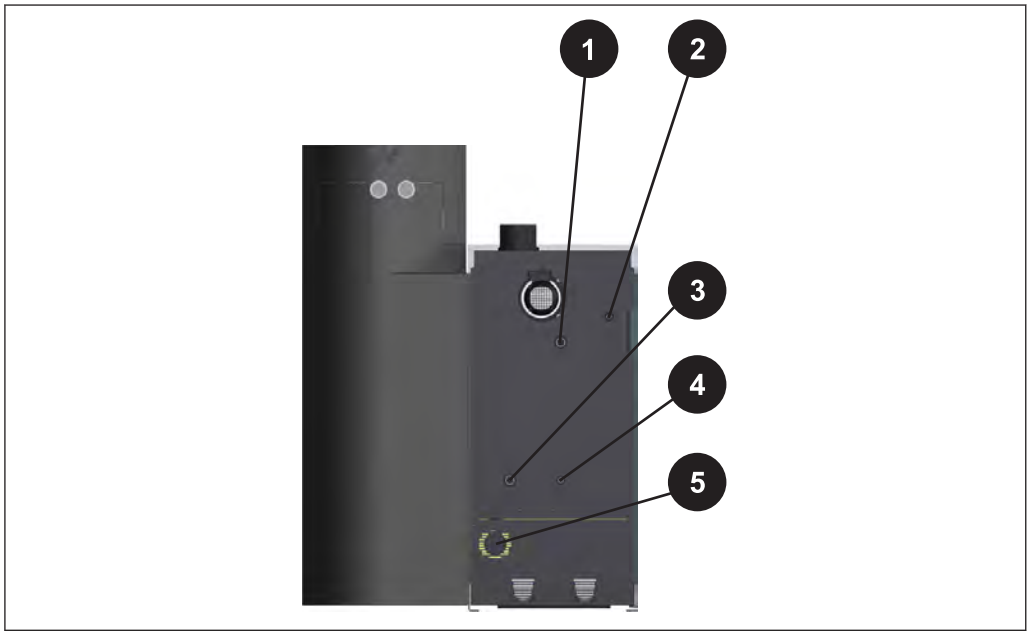
2.1 Width



1	Control panel of the Lambdatronic P 3200 Touch control
2	Heat exchanger with integrated spiral springs
3	Steel combustion chamber
4	Combustion grate
5	Comfort ash box (P4 Pellet 8 – 25)
6	Grate output
7	Hot air ignition
8	Burn back flap
9	Stoker screw
10	Hopper
11	Suction turbine
12	Speed-controlled induced draft fan
13	Ash chamber
14	Ash container (P4 Pellet 32-100)

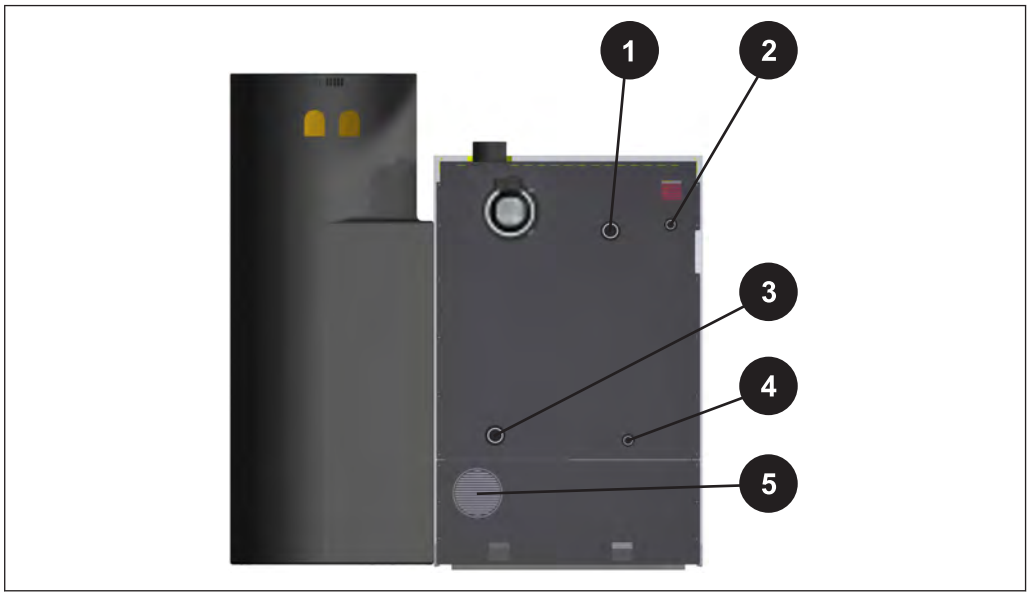
2.2 Back view

2.2.1 P4 Pellet 8-38



1	Boiler return connection
2	Air vent connection
3	Boiler flow connection
4	Drainage connection
5	Combustion air connection

2.2.2 P4 Pellet 48-100



1	Boiler flow connection
2	Air vent connection
3	Boiler return connection
4	Drainage connection
5	Combustion air connection

2.3 Boiler Fabrication and Testing

Your boiler was manufactured by Froling, a world leader in hot water (hydronic) heating for over 50 years. The P4 Pellet boiler confirms to traditional high standards for quality and reliability. It offers modern wood pellets boiler technology with operating efficiencies at over 90% based on net calorific value of fuel. If treated properly and operated according to the guidelines in this manual it will provide years of safe, dependable and economic heating.

P4 Pellet boilers are designed and built in accordance with European Standard EN 303-5. Beyond that the P4 Pellet 80/100 boiler is also available with an ASME stamp. The units were safety and performance tested and listed to UL 2523-2013 and CAN/CSA B366.1-2011 by OMNI Test Laboratories, Inc; Portland, Oregon. The installer should follow local or state installation requirements.

The P4 Pellet boiler is a wood pellets boiler designed and constructed for highly efficient combustion of wood pellets.

Do not burn other fuels in the P4 Pellet boiler. The P4 Pellet boiler is not a self contained weather-tight boiler. It should be installed within the heating building. P4 Pellet boilers should be installed with a thermal storage system to prevent short-cycling of the boiler during periods when the building is not calling for heat.

2.4 Models and Application

Ten P4 Pellet boiler models are available (8/15, 20/25, 30/38, 48/60 and 80/100) covering an output range between 35,800 Btu/hr and 341,200 Btu/hr. Models 8/15, and 20/25 are available with pneumatic hopper or 63,4 gal (240 liter) day bin. Specification data for each P4 Pellet boiler is approved in the Owner´s Manual and Assembly Instrustions. The boiler can be used either as a single heat source or in parallel with another boiler.

2.5 Short description

The P4 Pellet boiler is a boiler that produces useful heat for heating space and preparing hot water. The boiler uses wood pellets for fuel.

The pellets are transported by the suction turbine via the suction hoses into the large hopper. The pellets are transported to the downpipe with the stoker screw and fall in a metered quantity onto the combustion grate of the sturdy steel combustion chamber. Hot air is added by the automatic ignition to ignite the pellets.

The heat generated during combustion is used in the heat exchanger to heat the water. The flue gases produced during the combustion process are channeled outside through the chimney.

The movement of the integrated spiral springs automatically cleans the heat exchanger, maintaining the high operating efficiency. The ash from the steel combustion chamber falls through an automatic sliding grate into large, comfort ash drawers (P4 Pellet 8 – 25). Starting with the P4 Pellet 32 model, the ash falls into the ash chamber, where it is transported via the ash screw into large ash containers.

3 Safety

3.1 Explanation of symbols

Safety information

Safety information in these instructions is indicated by symbols. The safety information is preceded by signal words which reflect the extent of the risk.

⚠ DANGER **This symbol and signal word combination indicates a hazardous situation which will lead to death or serious injury if it is not avoided.**

⚠ WARNING **This symbol and signal word combination indicates a hazardous situation which could lead to death or serious injury if it is not avoided.**

⚠ CAUTION **This symbol and signal word combination indicates a hazardous situation which could lead to slight or minor injuries if it is not avoided.**

NOTICE **This signal word indicates important, but not safety-related information e.g. damage to property or pollution**

Safety information in operating instructions

Safety information can refer to certain, individual operating instructions. To avoid disrupting the flow of the text when you are performing the action, this safety information is not incorporated in the operating instruction. The signal words set out above are used.

Example:

❒ Undo screw
❒ **CAUTION! Pinching hazard at cover**
Take care when closing the cover.
❒ Tighten the screw

Special safety information

The following symbols are used to draw your attention to particular hazards

Tips and recommendations

Italics indicate useful tips and recommendations as well as information for efficient and smooth running.

Other markers

The following markers are used in these instructions to highlight operating guidelines, results, lists, references, and other elements:

Marker	Explanation
r	Step-by-step operating instructions
↪	Results of actions
ð	Links to sections of these instructions and other relevant documents
▪	Lists without a specified order
[Button]	Operating elements (e.g. button, switch), display elements (e.g. signal lights)
“Display“	Screen elements (e.g. buttons, assignment of function keys)

Units used

All units of measure are specified in these operating instructions in both SAE units and SI units. The SAE unit appears first, followed by the SI unit in brackets.

Example using information about heat output: 17 (5) BTU/h (kW) equals 17 BTU/h (SAE system) or 5 kW (SI system).

3.2 Permitted uses

The Froling P4 Pellet boiler is intended exclusively for heating up heating water. Only use those fuels specified in the “Permitted fuels” section.

Permitted use includes compliance with all the specifications in this instruction manual.

Any use other than or above and beyond the permitted use is considered misuse.

3.3 Requirements at the place of installation

3.3.1 Approval for the heating system

The appropriate supervisory authority (inspection agency) must always be informed when installing or modifying a heating system, and authorization must be obtained from the building authorities. Also observe ANSI/NFPA 211 and CAN/CSA B365 for the installation.

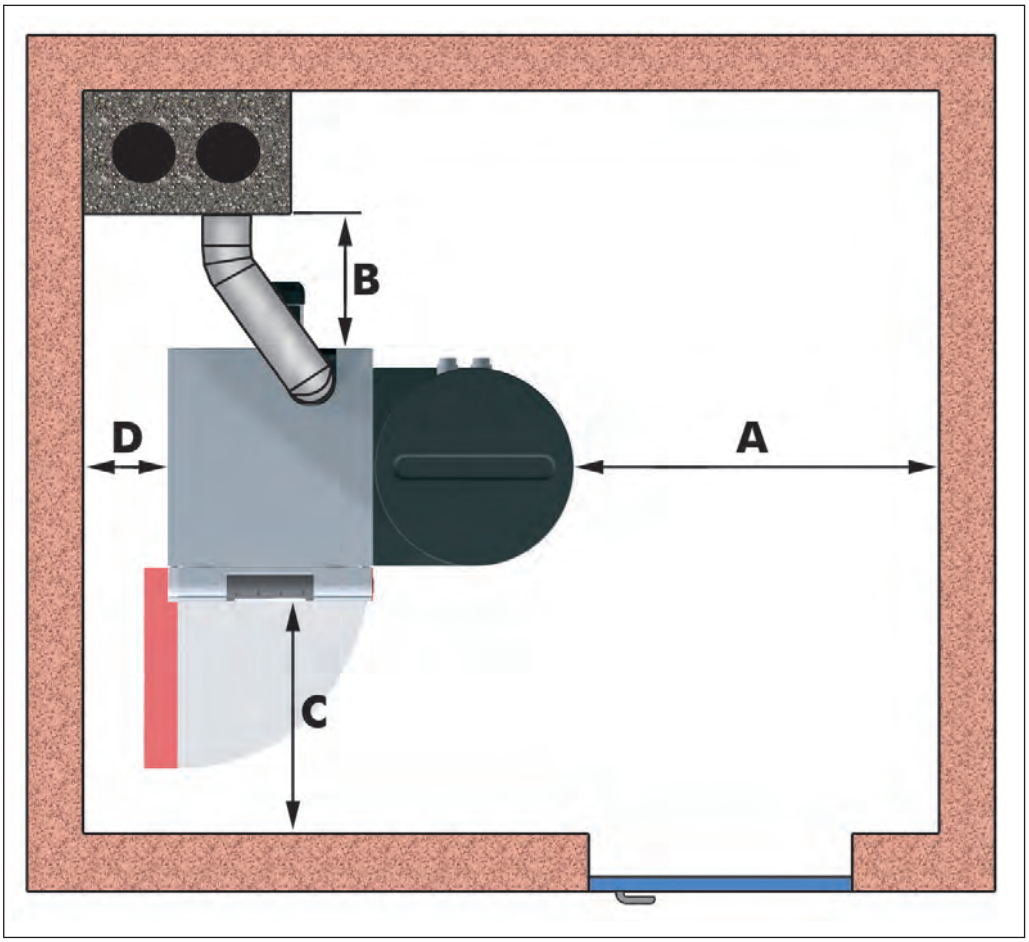
3.3.2 Minimum distances and clearances to combustibles in the boiler room

- The system should generally be set up so that it is accessible from all sides allowing quick and easy maintenance.
- Regional regulations regarding necessary maintenance areas for inspecting the chimney should be observed in addition to the specified minimum distances!
- Observe the applicable standards and regulations when setting up the system.
- Observe additional standards for noise protection (ÖNORM H 5190 - Noise protection measures)

FOR SAFE INSTALLATION AND OPERATION CLEANRANCES TO COMBUSTIBLES MUST BE MAINTAINED.

The diagram below shows the required space for the system in the boiler room.

The boiler may only be installed on non-combustible floors with these clearances!



			P4 Pellet				
	Description	**Unit**	**8 – 15**	**20 – 25**	**32 – 38**	**48 – 60**	**80 – 100**
A	Minimum distance to stoker assembly	inch (mm)	12 (300)	12 (300)	12 (300)	12 (300)	12 (300)
B	Induced draft fan maintenance area		12 (300)	12 (300)	12 (300)	12 (300)	12 (300)
C	Space for insulated door		22 (550)	29 (720)	33 (830)	20 (490)	24 (590)
D	Minimum distance to side of boiler		8 (200)	8 (200)	8 (200)	8 (200)	8 (200)
Distance between ceiling and boiler			18 (460)	18 (460)	18 (460)	18 (460)	18 (460)
Additional area to be covered is underneath the chimney connector and extending at least 2 inches (50 mm) on either side of the chimney connector.							

3.3.3 Requirements for central heating water

Water quality

Water of the following quality is required for the first fill:

- The water must be clean, pure or purified as well as odorless and must not contain suspended matter.
- The water hardness must not exceed 190 grain/fl.oz. or 100 ppm $CaCO_3$ (100 mg/l), i.e. soft water is required.
- The chlorine concentration in the water must not exceed 58 grain/fl.oz. (30 mg/l).
- The pH value in the heating system must be between 8.0 and 8.6.
- If the water quality is too poor, use additives to prepare the water. If you are topping up with small amounts, always use clean water.

NOTICE

The hot water must not be used directly in swimming pools or thermae. Use a heat consumer of the right size to consume the heat. Do not use the heating water as drinking water.

To ensure good water quality during operation, avoid leaks and use a closed heating system. If necessary, use a return temperature control.

First fill

To prevent air from getting into the heating system during the first fill, fill the filling hose with water.

Frost protection

You can add anti-freeze to the heating water, however, this can reduce the heating efficiency. Always follow the manufacturer's dosing instructions when using anti-freeze, as using the incorrect amount can cause corrosion. Check the concentration of the anti-freeze at regular intervals.

3.3.4 Ventilation requirements for boiler room

Introduction

The external combustion air must meet certain requirements to ensure that adequate combustion air is supplied to the boiler and no by-products from the combustion get into the boiler room.

Ventilation air for the boiler room must be taken from and expelled directly outside, and the openings and air ducts must be designed to prevent weather conditions (e.g. from foliage or snowdrifts), plants or animals from obstructing the air flow. Permanent ventilation is required to ensure that the boiler runs smoothly.

In North America there are several regulations which govern the minimum requirements of combustion air for chimneys.

The boiler must be installed in such a way that it receives adequate ventilation and combustion air and that the fuel in the boiler burns. The exhaust air must be expelled safely outside via the chimney and maintained within a safe temperature range.

Boiler rooms are usually so small that normal ventilation does not provide enough air and air must be brought in from outside. External air openings and air channels must be of an appropriate size to supply adequate combustion air. The design must comply with NFPA 211.

Consult your local chimney inspector for the installation and install the boiler in accordance with the applicable local regulations.

Recommended size of air openings according to NFPA 54 and NFPA 211:

The boiler requires a fresh air supply of between 1 sq.in. per 2,500 BTU/h and 1 sq.in. per 4,000 BTU/h (550 mm²/kW and 880 mm²/kW), depending on local conditions and the climate zone. Local conditions may necessitate an additional air supply.

3.3.5 Requirements for the heating system

- The whole heating system must be designed in accordance with relevant national and local regulations.
- The boiler's nominal load must be adjusted to the calculated heating requirements of all the consumer loads connected in the heating circuit in summer and winter.
- The heating system must be big enough to transport the heat generated by the boiler and an additional heat source (if present). The pressure throughout the whole system including all heating zones must be even.
- Special equipment must be available for filling and ventilating the heating circuit. Flow valves and zone valves must be fitted to set the correct water flow volume.
- All fitted pipes must be water-tight and air-tight and safely insulated.
- If there is a risk of parts of the heating system freezing, add anti-freeze to the water in these heat zones.

3.3.6 Requirements for the installation room (boiler room)

- There must not be a potentially explosive atmosphere in the boiler room as the boiler is not suitable for use in potentially explosive environments!
- The boiler room must be frost-free.
- The boiler does not provide any light, so the customer must ensure sufficient lighting in the boiler room in accordance with national workplace design regulations.
- When using the boiler above 2000 meters above sea level you should consult the manufacturer!
- Danger of fire due to flammable materials!
  No flammable materials should be stored near the boiler. Flammable objects (e.g. clothing) must not be put on the boiler to dry.
- Damage due to impurities in combustion air!
  Do not use any solvents or cleaning agents containing chlorine in the boiler room.
- Keep the air suction opening of the boiler free of dust!

⚠ WARNING **Do not store fuel within installation clearances!**

3.3.7 Requirements for the fuel store

- The fuel store must be protected against the direct effects of weather.
- Before refilling the fuel store, check for pellet dust and clean if necessary.
- When fans are used in the fuel storage area, they should be installed so as not to create negative pressure in the room where the solid-fuel-burning appliance is located.

3.3.8 Combination with a storage tank

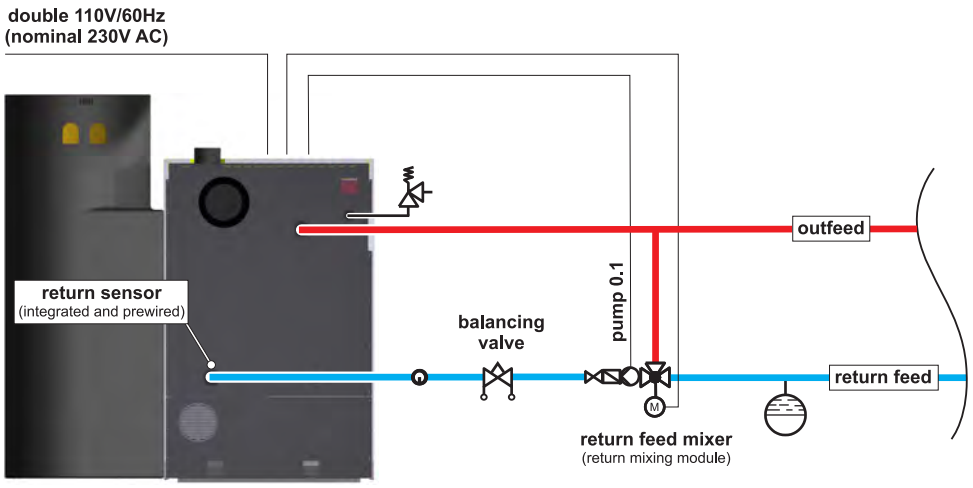
A storage tank does not need to be used for the heating system to run smoothly. However, we recommend that you use the system with a storage tank to ensure a continuous supply of fuel in the boiler's ideal output range.

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 Froling.

3.3.9 Return temperature control for P4 Pellet 80/100

When installing a P4 Pellet 80/100, a return temperature control must be installed. If the hot water return is below the minimum return temperature, some of the hot water outflow will be mixed in via the return temperature control.

Pellet boiler P4 Pellet 80/100 - Return feed lift with mixing valve



Check parameter setting:

Navigate to menu „*System*" ⇨ „*System selection*" ⇨ „*Boiler type*" ⇨ „*P4 Pellet 32 - 100*" and set parameter „*Return flow mixer through external modul*" to „*YES*".

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3.3.10 Requirements for the chimney connection

The chimney connection must be big enough to channel flue gases from the building. The whole flue gas system must be designed to prevent possible seepage, insufficient feed pressure and condensation.

The manufacturer recommends fitting a draft regulator to limit the pressure to 0.10 mm WC (25 Pa). The draft regulator should be fitted directly below the chimney connection where the pressure is very low.

The boiler must be connected to a brick chimney or a shop-made chimney in accordance with UL 103 HT (ULC S629 in Canada). The chimney must be clean and in good condition at the time of installation.

The pipe unions within the chimney must be made of stainless special steel (with 304, 316 or 321 alloys). The individual pipe sections must be joined together with at least three self-tapping screws and the joins sealed using high-temperature silicone. The flue gas pipe must not contain more than two 90° bends.

All connections must conform to NFPA 211. Consult your local chimney sweep for the installation and install the boiler in accordance with the applicable local regulations.

The chimney connection, ventilation ducts and fresh air openings must not be closed over or blocked.

The flue gas pipe must not be displaced by an attic, loft, fuel store or similar areas.

Basic data for designing the chimney connection

Description		P4 Pellet			
		8	15	20	25
Flue gas temperature at nominal load	°C	140	150	150	150
Flue gas mass flow at nominal load	kg/s	0.007	0.010	0.014	0.018
Flue gas mass flow at partial load		0.003	0.004	0.006	0.007
Required feed pressure at nominal load	mbar	0.08	0.08	0.08	0.08
Required feed pressure at partial load		0.06	0.06	0.06	0.06
Maximum permissible feed pressure		0.25			
Flue spigot diameter	mm	130	130	130	130

Description		P4 Pellet			
		32	38	48	60
Flue gas temperature at nominal load	°C	160	160	160	170
Flue gas mass flow at nominal load	kg/s	0.022	0.039	0.039	0.043
Flue gas mass flow at partial load		0.009	0.017	0.017	0.019
Required feed pressure at nominal load	mbar	0.08	0.08	0.08	0.08
Required feed pressure at partial load		0.06	0.06	0.06	0.06
Maximum permissible feed pressure		0.25			
Flue spigot diameter	mm	150	150	150	150

Description		P4 Pellet	
		80	100
Flue gas temperature at nominal load	°C	160	170
Flue gas mass flow at nominal load	kg/s	0.060	0.076
Flue gas mass flow at partial load		0.021	0.026
Required feed pressure at nominal load	mbar	0.08	0.08
Required feed pressure at partial load		0.06	0.06
Maximum permissible feed pressure		0.25	
Flue spigot diameter	mm	200	200

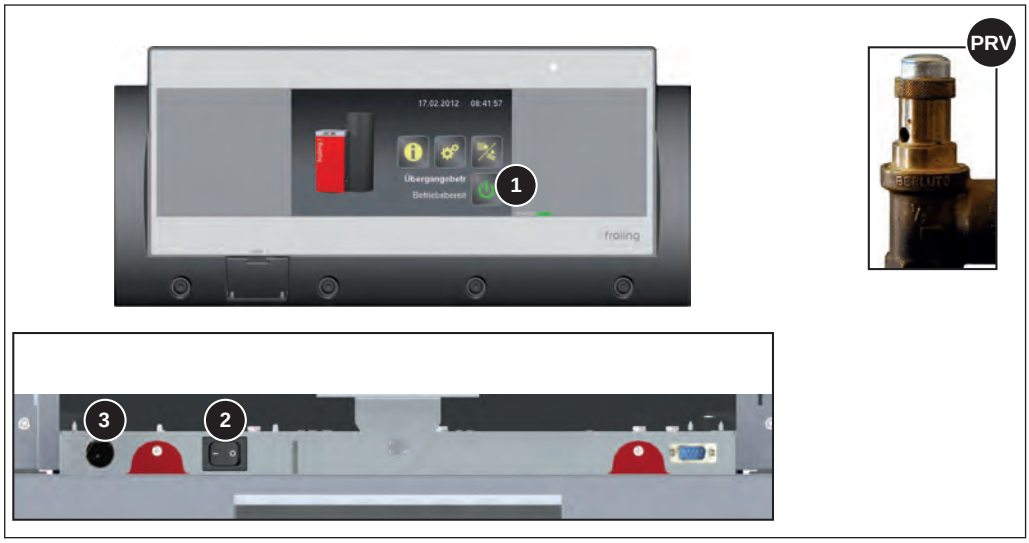
⚠ CAUTION

ADJUSTMENT OF THE FLUE DRAFT HIGHER THAN 0.10 INCHES WATER COLUMN (25 Pa) COULD CAUSE FIRE TO BURN OUT OF CONTROL AND AN UNSAFE CONDITION!

❒ Maximum permitted setting: 0.10 inches WC (25 Pa)
Ideal setting: 0.04 inches WC (10 Pa)

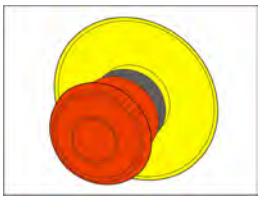
3.4 Safety devices

3.4.1 Position of safety devices



1	Lambdatronic P 3200
2	Main switch
3	High-limit thermostat STL

3.4.2 Description of safety devices



Emergency stop button (optional)

Pressing the emergency stop button stops the entire boiler (fuel infeed, combustion process in the boiler and the blower fan). Only the pump in the heating circuit continues to run to be able to dissipate the residual heat. The emergency stop button is on the same safety chain as the high-limit thermostat.

After an emergency stop button has been pressed, it must be released again by turning it and the fault acknowledged at the SPS so that you can turn the heating system back on again.

The system is controlled via the Lambdatronic P 3200. The "*Boiler OFF*" command allows you to switch off the boiler in the event of overheating. After the boiler has been switched off via the control system, automatic mode is switched off and the control shuts the boiler down according to the shutdown procedure. The pumps continue to run.

Main switch

The system is powered via the main switch. Turning the main switch to the "0" position disconnects the system from the power supply. The main switch is located under the upper insulating cover.

⚠ 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.

Safety valve (provided by the customer)

Depending on the boiler type which is use, different kinds of pressure values of the safety valves are necessary! When the boiler reaches a pressure of 30 psi (2 bar), 43.5 psi (3 bar) or 45 psi (3 bar) the safety valve opens and the heated water is blown off in the form of steam.

⇨ See "Technical specifications" [page 91]

3.5 Safety markers

3.5.1 Mandatory signs

Refer to the operating instructions

Only use the indicated system once you have read the operating instructions.

Wear hearing protection

This sign indicates that hearing protection must be worn in the area concerned.

Wear protective gloves

This sign indicates that protective gloves must be worn in the area concerned.

Wear safety shoes

This sign indicates that safety shoes must be worn in the area concerned.

Wear a dust mask

This sign indicates that a dust mask must be worn in the area concerned.

Keep the doors closed

Keep the doors closed during operation.

Turning off the main switch

Switch off the main switch and take precautions to prevent accidental switching on before carrying out work to the system

Switch off the main switch for the fuel infeed and take precautions to prevent accidental switching on before entering the storeroom.

Securing the main switch

Switch off the main switch and secure with a padlock when carrying out maintenance work to the boiler.

3.5.2 Prohibitions

Unauthorized access prohibited

Only persons authorized by the operator may enter the danger zone and storeroom. Keep children away! Keep the storeroom locked and keep the access key in a safe place. Protect the fuel from moisture.

No fire, open flames or smoking

Areas marked with this are at risk of fire or explosion. Keep ignition sources away from these areas.

3.5.3 Warning signs

Risk of falling

There is a risk of falling when working at heights in the storeroom or on components of the fuel infeed. Use a suitable ladder or hoist for all work.

Automatic start-up

This sign indicates that there is a risk of the system starting up automatically. Work may only be carried out in areas with this marking if the system has been secured.

Electric current

Only licensed electricians may work in workspace with this marking.

Unauthorized persons are not permitted to enter work areas with this marking or open the cabinet with this marking.

Risk of collapse

There is a risk of collapse and being buried alive as a result of cavity formation in the fuel storeroom. Never step on piles of fuel.

Harmful or irritant materials

These materials can be irreparably harmful to health, trigger allergic reactions or irritate the mucous membranes.

Observe the information on the packaging and containers.

Danger from carbon monoxide

There is a risk of poisoning from a possible concentration of carbon monoxide in the fuel storeroom and boiler room. Ventilate the fuel storeroom for at least 15 minutes before entering. Two people must always be present when working in the fuel storeroom. The access door must be kept open at all times. Also wear a dust mask because of the high dust levels.

Hand injuries

Keep hands away from areas bearing this warning.

There is a risk that your hands could get trapped, pulled in or otherwise injured.

Hot surfaces

Hot surfaces, such as hot system parts, may not always be obvious. Do not touch these parts without protective gloves.

Crushing hazard

Keep hands away from areas bearing this warning.

There is a risk that your hands could get trapped, pulled into or otherwise injured in automatic screws.

Risk of falling

There is a risk of falling in the fuel store because of slippery surfaces or fuel lying about. Take extreme care and wear personal protective equipment.

Risk of injury at fans

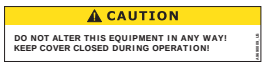
Keep hands away from areas bearing this warning.

There is a risk that your hands could get trapped, pulled into or otherwise injured in automatic fans.

Risk of being buried alive

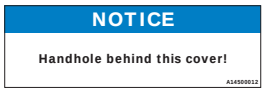
There is a risk of being buried alive in the fuel storeroom. Keep out of the fuel storeroom, especially during filling.

3.5.4 Additional safety signage



Warning sign for covers

Do not modify the system peripherals. The covers must be kept shut during operation.



Notice for maintenance opening

The opening for the visual inspection of the heat exchanger tubes is behind this cover.

3.5.5 Signage on the boiler

The following signs are located on the boiler. They highlight dangers during operation as well as the correct procedure in hazardous situations.

Notice of risks during installation

P4 PELLET - WOOD PELLET FIRED BOILER

INSTALLATION HAZARDS

Install, modify and use only in accordance with manufacturer's manuals. Refer to authorities having jurisdiction for proper installation. Contact local building and fire officials about restrictions and installation inspection in your area. If there are no applicable local codes, follow ANSI/NFPA 211 and CAN/CSA B365. Special precautions are required for passing the chimney through a combustible wall or ceiling.
Inspect and clean exhaust system, heat exchanger, burner, pellet hopper and ash boxes frequently in accordance with owner's manual.

Basic boiler data for layout of chimney system		P4 PELLET				
Quantity	**Unit**	**8 / 15**	**20 / 25**	**32 / 38**	**48 / 60**	**80 / 100**
Flue gas temperature Rated / partial load	°F °C	300 / 210 150 / 100	300 / 210 150 / 100	320 / 210 160 / 100	340 / 210 170 / 100	340 / 210 170 / 100
Minimum draft at boilers flue gas connection		0.03 inches water column (5 Pa)				
Maximum draft at boilers flue gas connection		0.10 inches water column (25 Pa)				
Flue gas connector Diameter		5 inches (130 mm)		6 inches (150 mm)		8 inches (200 mm)
Maximum water temperature	°F °C	176 80			190 88	
Maximum allowable working pressure according to heat exchanger design:	EN 303-5	30 psi (2 bar)				45 psi (3 bar)
	ASME	not available				43.5 psi (3 bar)

For detailed design information please refer to Installation Manual! For unit specifications, see Listing Label! For supply connections use No. 14 AWG (2.1mm²) or larger wires acceptable for at least 194°F (90°C). Use copper. Use regular overcurrent protection device 15 AMP, two phases (L1 & L2).

DANGER!

- Working on electrical components may cause severe injuries from electric shocks!

WARNING!

- The electrical system of the boiler shall be supplied from a double 115 V 60 Hz (nominal 230 V AC) 15 amp branch circuit including neutral and earth connection. For wiring instructions please refer to Installation Manual!
- Chimney must be 5" (130mm - P4 Pellet 8 - 25), 6'' (150 mm - P4 Pellet 32 - 60) or 8" (200 mm – P4 Pellet 80/100) diameter listed UL-103 HT or ULC-S629 residential all-fuel type or tile-lined masonry. Flue connector pipe must be 5" (130mm - P4 Pellet 8 - 25), 6'' (150 mm - P4 Pellet 32 - 60) or 8" (200 mm – P4 Pellet 80/100) diameter made of a minimum 24 MSG black steel.
- Inadequate design, installation and maintenance of the flue gas system will lead to insufficient chimney draft and could result in Danger of Life or Severe Injury caused by serious faults in combustion, e.g. explosively combustion of carbonization gases and flash fires!
- This boiler requires fresh air for safe operation and must be installed so there are provision for adequate combustion and ventilation air!

CAUTION!

- DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE!
- LOAD FUEL CAREFULLY OR DAMAGE MAY RESULT.
- REFER TO OWNER´S MANUAL. DO NOT ALTER THIS EQUIPMENT IN ANY WAY.
- UNSAFE TO ADJUST FLUE DRAFT HIGHER THAN 0.10 INCHES WATER COLUMN (25 Pa)
- MAY BE CONNECTED TO AN EXISTING BOILER SYSTEM.
- Flooring must be a minimum 3/8'' (10 mm) non-combustible material covering the installation clearance area! The floor must be level and reinforced if required. For construction of the floor beneath the boiler mind the weight of boiler, water content and wood fuel according to the Installation Manual!
- This boiler is for use with an automatic stoker only!
- Use original spare parts only. Installation of non-licensed replacement parts will void the warranty!

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Notice of risks during operation

P4 PELLET - WOOD PELLET FIRED BOILER

OPERATION HAZARDS

NOTICE! Burn Wood Pellets only as specified in Owner's Manual!

Pellet Fuel Institute (PFI) Standard "Premium" recommended.

DANGER! Risk of Fire or Explosion!

- Do not burn garbage, gasoline, drain oil, or other flammable liquids.
- DO NOT BURN GARBAGE, GASOLINE, NAPHTA, ENGINE OIL, OR OTHER INAPPROPRIATE MATERIALS!
- DO NOT USE CHEMICALS OR FLUIDS TO START UP THE FIRE.
- Use of inappropriate fuels can result in Danger of Life or Severe Injury caused by explosive combustion and flash fires!
- Burning fuels other those designated in the manual will void the warranty!

DANGER! Explosive Gases!

- Never open Boiler doors, Covers or Heat Exchanger Cask Cover during operation!
- Faulty operation of boiler system will cause Danger of Life or Severe Injury and Material Damage!
- TO AVOID INJURY FROM MOVING PARTS; SHUT OFF BOILER CONTROL SYSTEM BEFORE OPENING BOILER DOORS; COVERS OR HOPPER CASING!

WARNING! Risk of Fire!

- Do not burn garbage, gasoline, drain oil, or other flammable liquids or materials.
- KEEP ALL BOILER DOORS, FUEL STORAGE DOOR AND ALL COVERS TIGHTLY CLOSED DURING OPERATION!
- AFTER OPENING BOILER DOORS, COVERS OR HOPPER CASING CLOSE ALL DOORS, COVERS AND CASING TIGHTLY!
- DO NOT OPERATE WITH FLUE DRAFT EXCEEDING 0.10 INCHES WATER COLUMN (25 Pa)!
- Do not operate with flue draft exceeding 0.10 inches in water column (25 Pa).
- UNSAFE TO ADJUST FLUE DRAFT HIGHER THAN 0.10 INCHES WATER COLUMN (25 Pa)!
- THE HEAT EXCHANGER, DRAFT INDUCER, FLUE PIPE, AND CHIMNEY MUST BE CLEANED REGULARLY TO REMOVE ACCUMULATED CREOSOTE AND ASH. ENSURE THAT THE HEAT EXCHANGER, FLUE PIPE, AND CHIMNEY ARE CLEANED AT THE END OF HEATING SEASON TO MINIMIZE CORROSION DURING THE SUMMER MONTHS. THE APPLIANCE, FLUE PIPE, AND CHIMNEY MUST BE IN GOOD CONDITION. THESE INSTRUCTIONS ALSO APPLY TO A DRAFT INDUCER IF USED.
- Do not store fuel or other combustible material within marked installation clearances!
- Faulty operating conditions not complying with Owner's Manual, such as insufficient combustion air, incorrect or insufficient cleaning and maintenance or non-permitted fuel could result in Danger of Life or Severe Injury caused by serious faults in combustion (e.g. spontaneous combustion of carbonization gases or flash fires)!
- Inspect and clean flues and chimney regularly!
- First firing during start-up of boiler system shall be carried out in attendance of an authorized installer or manufacturer's representative only! Disregarding of warning may cause damage or explosion of combustion chamber and severe injuries unfavorably!

CAUTION! Hot surfaces!

- Hot parts and the flue pipe can cause serious burns!
- Do not touch during operation.
- Maximum draft marked on nameplate.
- Unauthorized access to the boiler room and pellets store could result in personal injury and damage to property!
- FOR SAFETY KEEP FIRING AND ASHPIT DOORS TIGHTLY CLOSED.
- Keep children away.
- Always use protective gloves during maintenance.
- Always use control handles when open boiler doors.
- Insulate flue pipe and do not touch during operation.
- Do not carry out maintenance when the boiler is hot.
- Do not touch hot surfaces behind Boiler doors, Covers and Hopper casing.

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Notice regarding procedures in an emergency

P4 Pellet – WOOD PELLET FIRED BOILER

EMERGENCY PROCEDURES

⚠ DANGER! In case of strong smell of flue gas!

Flue gases can cause fatal poisoning!
- Do not open any boiler doors or covers, or fuel transportation system door or covers!
- Turn off the boiler by pressing “Boiler OFF” (⏻)
- Air the room where boiler is installed!
- Close the door of the boiler room and doors to living areas!

⚠ DANGER! In the event of loss of electrical power!

- Do not open any boiler doors or covers, or fuel transportation system doors or covers!
- Boiler Control automatically restarts after power fail restart.
- Half an hour after power has returned, check system for normal operation and compare the pressure gauge reading to initial settings. If system pressure is low, replenish water to the heating system according plumber’s instructions.

⚠ DANGER! In the event of runaway fire!

- Call the fire department!
- Turn off Emergency Switch, if installed.
- Do not open any boiler doors or covers, or fuel transportation system doors or covers!
- Do not switch off Main switch at Boiler!
- Evacuate your house.
- If possible, wet your entire roof with a garden hose.
- When there is no more risk of runaway fire, turn on Emergency Switch and resume to normal operation of the system.

To cool overheated boiler (over 220°F / 105°C)!

- Turn off Emergency Switch, if installed.
- Do not open any boiler doors or covers, or fuel transportation system doors or covers!
- Turn off boiler by pressing “Boiler OFF” (⏻)
- Open all mixer taps, switch on all pumps.
- Leave the boiler room and close the door.
- Open all hot water faucets.
- Turn all thermostats in your house to their highest temperature settings and open all windows if room heat is too hot
- When boiler temperature has dropped below 180°F (82°C), reverse the above steps.
- In case Safety Temperature Limit Switch automatically has been activated please refer to Owner’s Manual.

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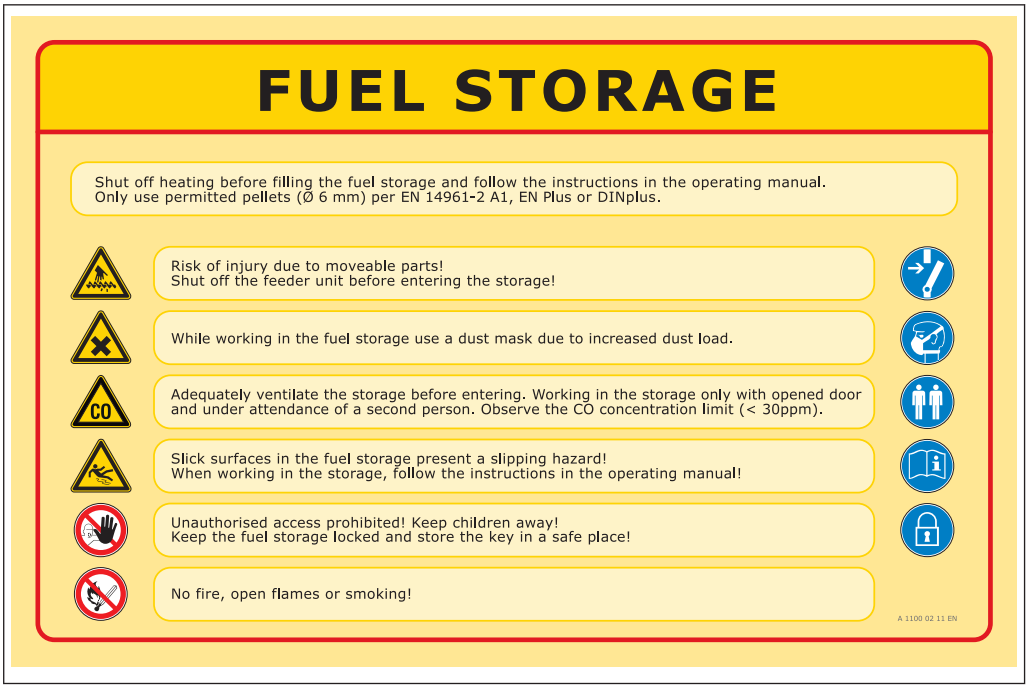
3.5.6 Sign on fuel store

The following signage is to be posted in the access area of the fuel store. It explains the correct fuel store procedures.



3.6 Residual risks

The system has been designed to the state of the art and in accordance with current safety requirements. There are, however, still some residual risks which require care and attention. The residual risks and consequential procedures and measures are listed below.

3.6.1 Basic risks

Incorrect operation

⚠ WARNING

Risk of injury from operating the system incorrectly!

❒ Modifications to the control system must only be undertaken in consultation with the manufacturer.

➥ Modifying parameters on the control system can cause malfunctions.

Noise

⚠ WARNING

Hearing loss from noise!

❒ Always wear hearing protection when working around the discharge system

➥ Depending on the discharge system and fuel, the noise level inside the discharge system can reach over 80 dB(A) during transportation of the fuel.

Risk of falling

⚠ WARNING

Risk of falling when working close to the boiler!

- ❒ When working on ladders, always ensure that the ladder is securely positioned on a firm and even surface.
- ❒ Always observe the relevant safety regulations when working with a hoist.
- ❒ Never step on the boiler.
  - ➥ Careless work on ladders or hoists during installation, maintenance and repair work can cause injury.

Working in the fuel store

⚠ WARNING

Risk of injury when carrying out work in the fuel store

- ❒ Switch the boiler off at the control system before entering the fuel store.
- ❒ Turn off the boiler's main switch.
- ❒ Never climb onto piles of fuel.
- ❒ For safety reasons never work in the fuel store alone. Take another person with you.
- ❒ Always wear personal protective equipment for work (protective clothing, safety shoes, protective gloves, dust mask, protective goggles).
- ❒ Also observe the information on the notice on the access door to the fuel store.
  - ➥ Piles of fuel are at risk of caving in if you stand on them when working in the fuel store. There is also a risk of poisoning due to an increased concentration of carbon monoxide in the air.

Dirt and objects lying around

⚠ CAUTION

Risk of injury from stumbling on dirt or objects lying around!

- ❒ Always keep the boiler room clean and tidy.
- ❒ Take any items no longer required out of the boiler room and, in particular, remove from ground level.
  - ➥ Dirt and objects lying around the boiler room constitute a risk of slipping and tripping. Falling can result in injury.

3.6.2 Risks from electricity

Electric current

⚠ DANGER

Risk of death from electrocution!

- ❒ Only allow licensed electricians to carry out electrical work to the electrical system.
- ❒ If the isolation gets damaged, switch off the power supply immediately and have it repaired.
- ❒ Prior to commencing work to active parts, shut off electrical systems and equipment so that they are no longer live and secure so that they remain off for the duration of the work. Follow the five safety rules:
  - Disconnect.
  - Secure against switching back on.
  - Check the system is no longer live.
  - Earth and short circuit.
  - Cover or shield any adjacent live parts.
- ❒ Never bypass or disable fuses. When replacing fuses, use the correct amperage.
- ❒ Always lay lines and cables far away from hot surfaces.
- ❒ Use shielded cables when using frequency converters.
- ❒ Ensure that the system is properly earthed with a protective earth system. Have all component assemblies checked at regular intervals to ensure the correct earthing.
- ❒ Keep moisture away from live parts. This can cause short circuits.
  - ➥ Touching live parts can cause immediate death by electrocution. Damage to the isolation or individual components can be perilous.

Static electricity from charge

⚠ CAUTION

Risk of injury from residual electrostatic potential!

- ❒ Always proceed with caution when working in the storeroom and wear personal protective equipment (protective clothing, safety shoes, protective gloves).
  - ➥ Electrostatic potential can build up when pellets are being blown in. Touching pellets in the storeroom can, therefore, result in injury.

3.6.3 Danger from movement of the system

Automatic start-up

⚠ WARNING

Risk of injury from automatic start-up!

- ❒ Before doing any work, switch the boiler off at the control system.
- ❒ Switch off the main switch and take precautions to prevent accidental switching on.
  - ➥ There is a risk of serious injury from the system starting up automatically if it is switched on during inspection and cleaning.

Screw movement

⚠ WARNING

Risk of injury from getting crushed, trapped and caught in moving screws!

- ❒ Never step onto the screws (if present) in the fuel store.
- ❒ Never reach into the transport screw of the fuel infeed or the ash discharge screws (if present) when they are running.
- ❒ Never bypass limit switches and fuses.
- ❒ Switch off the boiler at the control system and allow it to cool before carrying out work on the screws.
- ❒ Always wear personal protective equipment for work (protective clothing, safety shoes, protective gloves).
  - ➥ Moving screws can catch on parts of clothing or long hair and clamp or sever body parts, resulting in serious injury or death.

3.6.4 Danger from fire and explosion

Risk of fire and explosion

⚠ WARNING

Risk of fire and explosion around the boiler!

- ❒ DO NOT BURN GARBAGE, GASOLINE, NAPHTA, ENGINE OIL OR OTHER INAPPROPRIATE MATERIALS.
- ❒ DO NOT USE CHEMICALS OR FLUIDS TO START THE FIRE.
- ❒ DO NOT OPERATE WITH FLUE DRAFT EXCEEDING 0.10 INCHES WATER COLUMN (25 Pa).
- ❒ UNSAFE TO ADJUST FLUE DRAFT HIGHER THAN 0.10 INCHES WATER COLUMN (25 Pa).
- ❒ THE HEAT EXCHANGER, DRAFT INDUCER, FLUE PIPE, AND CHIMNEY MUST BE CLEANED REGULARLY TO REMOVE ACCUMULATED CREOSOTE AND ASH. ENSURE THAT THE HEAT EXCHANGER, FLUE PIPE, AND CHIMNEY ARE CLEANED AT THE END OF HEATING SEASON TO MINIMIZE CORROSION DURING THE SUMMER MONTHS. THE APPLIANCE, FLUE PIPE, AND CHIMNEY MUST BE IN GOOD CONDITION. THESE INSTRUCTIONS ALSO APPLY TO A DRAFT INDUCER IF USED.
- ❒ DO NOT INSTALL IN A MOBILE HOME.
- ❒ Keep covers on the boiler and the access doors to the fuel store closed during operation.
- ❒ Smoking, fire and open flames are not permitted in the fuel store and boiler room.
- ❒ Do not store flammable materials in the boiler room.
- ❒ Do not set flammable objects on the boiler to dry (e.g. clothing).
- ❒ Always ensure that the boiler room is adequately ventilated.
- ❒ Maintain and inspect the heating system at the prescribed intervals. Ensure that the chimney vent is cleaned regularly.
- ❒ Do not use any hydrogen halides or cleaning agents containing chlorine in the boiler room.
- ❒ Observe the safety signs around the system.
  - ➥ Using the boiler incorrectly can cause fire or explosions.

Fire protection

⚠ WARNING

Risk of injury from limited or incorrect firefighting!

- ❒ Ensure that all fire extinguishers provided are suitable for the fire class.
- ❒ Test that the fire extinguishers are fit for use every two years or in accordance with the regulations set out by the fire authorities.
- ❒ Refill the fire extinguisher after each use.
- ❒ Only use approved extinguishing agents and spare parts that match the prototype on the fire extinguisher.
- ❒ When using the fire extinguisher, follow the safety and operating instructions on it.
- ❒ Note the operating temperature range when using the extinguisher.
  - ➥ If, in the event of a fire, the fire extinguisher is not fit for use or unsuitable for the specific fire class, this can result in serious injuries or even death and significant damage to property.

Flue gas system

⚠ WARNING

Risk of injury and damage to property from obstructing the flue gas system!

- ❒ The chimney is only to be used as an outlet for one heating system.
- ❒ Optimum performance can only be guaranteed if the flue gas system is functioning correctly. It is, therefore, important to have the flue gas system cleaned regularly to ensure that the flue gas can escape properly.
- ❒ Arrange for the chimney sweep to check the chimney connection and chimney for tar oil deposits twice a month during the heating period.
  - ➥ Problems with the flue system, such as poor cleaning of the flue pipe or insufficient chimney escape can cause serious faults in combustion (such as spontaneous combustion of carbonization gases/explosion).

3.6.5 Danger from high temperatures

Hot surfaces

⚠ WARNING

Risk of injury from hot surfaces!

- ❒ FOR SAFETY REASONS, KEEP COVERS AND ASH PIT DOORS TIGHTLY CLOSED.
- ❒ Before carrying out any work on the boiler, switch it off at the control system (“Boiler OFF” status) and allow it to cool down.
- ❒ Protective gloves must usually be worn for work on the boiler. Only touch the boiler using the handles provided.
- ❒ Insulate the flue gas pipes and do not touch them during operation.
- ❒ Do not touch system parts and heating pipes during operation.
- ❒ Keep children and unauthorized persons away from the boiler and fuel store.
- ❒ Allow the boiler to cool before carrying out any maintenance work.
  - ➥ Touching hot surfaces on the boiler, on the flue gas pipe and on heating pipes can cause serious burns.

Hot media

⚠ WARNING

Risk of scalding from hot media!

- ❒ Temperature modifications in the control system must only be undertaken in consultation with the manufacturer.
- ❒ Do not touch heating pipes and consumer loads in the heating circuit (radiator etc.) during operation.
- ❒ Allow the system to cool before carrying out any maintenance work. Always wear protective gloves when working on the system.
- ❒ Keep children and unauthorized persons away from the heating system.
  - ➥ Heating pipes and consumer loads in the heating circuit can heat up considerably from the hot water. An incorrect setting in the control system means that the water obtained can be extremely hot. Contact with hot water or hot surfaces can cause scalding to skin.

Hot ashes

⚠ WARNING

Risk of injury from hot ashes!

- ❒ Always wear protective clothing and protective gloves when working on the system.
- ❒ Before handling ash, check whether or not it is still hot. Allow to cool if necessary.
  - ➥ Ash is extremely hot after the combustion process. Contact can cause serious burns.

3.6.6 Risks from flue gases, incorrect fuel and other equipment

Lubricants

⚠ WARNING

Risk of damage to health from lubricants!

- ❒ Always wear protective gloves when handling lubricants.
- ❒ Do not swallow, do not inhale fumes.
- ❒ If you accidentally get lubricant in your eyes, rinse thoroughly with plenty of water and seek medical advice if necessary.
- ❒ Following skin contact wash off thoroughly with plenty of soap and water.
- ❒ Observe the lubricant manufacturer's safety data sheets.
  - ➥ Contact with lubricants can cause allergies and skin irritations.

Proposition 65

⚠ WARNING

CALIFORNIA Proposition 65

This product may contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Leaking flue gas

⚠ WARNING

Risk of poisoning from flue gases in the boiler room!

- ❒ If you smell flue gas keep all the doors on the boiler closed.
- ❒ Switch off the boiler under controlled conditions using the controller.
- ❒ Ventilate the boiler room.
- ❒ Close the fire door and doors to living areas.
  - ➥ Contact with flue gases can cause perilous situations.

Carbon monoxide

⚠ WARNING

Risk of poisoning from carbon monoxide in the storeroom!

- ❒ Ensure that there is adequate ventilation before entering the storeroom.
- ❒ For safety reasons never work in the storeroom alone. Take another person with you.
  - ➥ Carbon monoxide is an odorless gas and, therefore, goes unnoticed. Carbon monoxide can develop from storing pellets in the storeroom, and an increased carbon monoxide concentration in the air can pose a risk of poisoning.

Explosive dusts

⚠ WARNING

Risk of death from fire and explosion due to dispersed dust deposits!

- ❒ Do not smoke within or close to the danger zone. Do not work with any kind of naked flame, fire or ignition sources.
- ❒ Keep the danger zone free from dust. Dust deposits over 5 mm thick are not permitted and must be removed.
- ❒ Do not enter the storeroom whilst pellets are being blown in.
- ❒ Always wear protective clothing, protective goggles and breathing protection when working in the storeroom. Follow the manufacturer's instructions with regard to the requirements of the breathing protection.
- ❒ Stop work immediately in the event of a fire. Leave the danger zone until you get the all-clear and notify the fire brigade.
  - ➥ Dust deposits could catch fire or form an explosive compound if dispersed with the ambient air when blown into the storeroom. This can result in serious and even fatal injuries.

Incorrect fuel

⚠ WARNING

Risk of injury and damage to the boiler if the incorrect fuel is added.

- ❒ Only use fuel permitted by the boiler manufacturer.
- ❒ Only store permitted fuel in the fuel store.
- ❒ Never burn corn, cereal, coal, coke, garbage, painted or treated wood, bark, petrol, oil or other flammable liquids in the boiler.
- ❒ Never store fuel or other flammable materials in the boiler room.
- ❒ Never use chemicals, kerosene, charcoal, spirits or other flammable liquids to start or reignite the combustion process in the boiler.
  - ➥ Using the incorrect fuel can cause dangerous malfunctions or damage to the system or the discharge system.

3.7 What to do in the case of danger

What to do if the system overheats (at temperatures above 220°F (105°C))

⚠ WARNING

Risk of injury from switching the system off prematurely at the main switch!

❒ To switch the boiler off, switch off automatic mode using “Boiler OFF" at the control system. The boiler follows the controlled shutdown procedure via the control. The system must only be switched off at the main switch once the boiler has cooled down sufficiently.

➥ Switching off the main switch in automatic mode can cause major combustion faults leading to serious accidents.

If the boiler overheats, proceed as follows:

❒ Switch the boiler off at the control system.

❒ Keep all doors on the boiler and all covers closed.

❒ Open all mixing valves; switch on all pumps. The Froling heating circuit control takes on this function in automatic operation.

❒ Leave the boiler room and close the access door.

❒ Ensure that heat is being consumed. To do this, activate all consumer loads.

❒ Open any available radiator thermostat valves.

❒ Once the boiler temperature has fallen to 185°F (85°C), return the heating circuit to normal status.

If the temperature does not drop:

❒ Inform the installer or Froling customer service.

What to do in the event of a power failure

In the event of a power failure proceed as follows:

❒ Keep all the doors on the boiler and covers on the fuel infeed closed

❒ The boiler controller will start again automatically after the restart.

➥ Half an hour after the boiler restart, compare the values in the controller and the values on the pressure gauges with the original values. If the pressure level is too low, add water to the heating system in accordance with the instructions of the heating installer.

In the event of excessive temperature the high-limit thermostat may have triggered. You may have to release this to allow the boiler to restart.

What to do if there is a smell of flue gas

If you smell flue gas, proceed as follows:

❒ Keep all doors on the boiler and all covers closed.

❒ Switch the boiler off at the control system.

❒ Ventilate the boiler room where the boiler is located.

❒ Close the fire door and doors to living areas.

What to do in the event of fire

In the event of a fire proceed as follows:

- ❒ Press the emergency stop button (if present).
- ❒ Keep all the doors on the boiler and covers on the fuel infeed closed
- ❒ Leave the main switch on the control cabinet switched on.
- ❒ Close the fire door.
- ❒ Leave the boiler room and the building.
- ❒ Notify the fire brigade.

3.8 Staff requirements

Risk of injury from inadequate qualification of staff!

⚠ WARNING

Risk of injury from inadequate qualification of staff!

If unqualified staff work on the system, or are within the danger zone of the system, this creates hazards which could cause serious injuries and considerable damage to property.

- ❒ All such activities should be carried out only by suitably qualified staff.
- ❒ Keep unqualified staff away from danger zones.

Definition of staff qualifications

The staff qualifications listed here for the United States are based on the descriptions of professional qualifications in the Occupational Outlook Handbook 2011-12 edition of the United States Department of Labor, Bureau of Labor Statistics.

In this manual, staff qualifications for the various activity areas are named as follows:

Operator

The operator is the person who operates the heating system for commercial or economic purposes by himself or cedes use/application to a third party and bears the legal responsibility concerning the product for the protection of the user or third parties during the operation.

He has been trained by the manufacturers and the suppliers in dealing with the system and its components and can independently detect potential hazards and avoid the associated risks.

Froling customer service or an authorized partner

The Froling customer service or its authorized partner is able to perform the tasks assigned to it and recognize and avoid possible dangers thanks to its professional, product-related training, knowledge and experience as well as its knowledge of the relevant local regulations.

Heating system installer

The heating system installer has demonstrably received specific instructions by the manufacturer regarding the tasks entrusted to him and potential dangers associated with improper conduct. The heating system installer must have read and understood these instructions. The heating system installer must have undertaken training and have professional experience of at least one year in his field of application.

The skills of the heating system installer include:

- ❒ Understanding technical contexts
- ❒ Reading and understanding technical drawings and diagrams
- ❒ Installing system components
- ❒ Installing and connecting of heating lines
- ❒ Performing maintenance work
- ❒ Dismantling and repairing or replacing system components, if a problem occurs

Licensed electrician

Thanks to his training, knowledge, experiences and knowledge of relevant standards and provisions the licensed electrician is capable of performing the following tasks on electrical systems professionally and according to safety requirements:

- ❒ Planning and connecting electrical systems based on circuit and current flow diagrams
- ❒ Assembling pipes and connecting electric components
- ❒ Analyzing, measuring and testing electrical systems and functions
- ❒ Performing safety checks on electrical systems, components and devices
- ❒ Troubleshooting electrical systems

The licensed electrician is able to independently recognize and avoid hazards associated with these works.

Chimney sweep

The chimney sweep is able to perform the tasks assigned to him and recognize and avoid possible dangers thanks to his professional training, knowledge and experience as well as his knowledge of the relevant standards and regulations.

The skills of the chimney sweep include:

- ❒ Understanding technical contexts
- ❒ Reading and understanding technical drawings and diagrams
- ❒ Checking heating, flue gas and ventilation systems as well as fuel stores for proper operation and fire safety
- ❒ Cleaning heating plants, smoke ducts and ventilation systems
- ❒ Knowledge of provisions under building law and environmental protection law, as well as knowledge in the field of energy efficiency, fire protection and climate protection
- ❒ Performing seal checks

Basic requirements

Only persons expected to carry out their work reliably are admitted as staff. Persons, whose responsiveness is influenced e.g. by drugs, alcohol or medicine are not admitted.

When choosing staff, observe the applicable age and profession-specific regulations on site.

Unauthorized

⚠ WARNING

Risk of death for unauthorized persons due to hazards in the danger zone and work area!

- ❒ Keep unauthorized persons away from the danger zone and work area.
- ❒ In case of doubt, address the persons and direct them to leave the danger zone and work area.
- ❒ Suspend the work as long as there are unauthorized persons in the danger zone and work area.
  - ➥ Unauthorized persons that do not meet the requirements described here, do not know the dangers in the work area. Therefore, unauthorized persons are exposed to risk of serious injury and even death.

Instruction

The operator must regularly instruct the staff. For the purposes of traceability, you must create a training log containing the following at minimum:

- ❒ Date of training
- ❒ Name of the trainees
- ❒ Contents of the training
- ❒ Name of the instructor
- ❒ Signatures of the trainees and the instructor

3.9 Personal protective equipment

Personal protective equipment is used to protect persons from compromised health and safety at work.

During the various types of work to and with the system the staff must wear personal protective equipment which is set out separately in the individual sections of this manual.

Description of the personal protective equipment

The personal protective equipment is as follows:

Protective workwear:

Protective workwear is tight-fitting work clothing with low tear resistance, narrow sleeves and without any protruding parts.

Protective goggles

Protective goggles are used to protect the eyes from flying parts when cleaning the system.

Protective gloves

Protective gloves are used to protect the hands against friction, abrasion, puncture, or deeper injuries and contact with hot surfaces.

Safety shoes

Safety shoes protect feet from crushing and falling parts as well as from sliding on slippery surfaces.

Dust mask

The dust mask is used for protection against dust when cleaning the system and when working in the fuel store.

3.10 Replacement parts

Incorrect replacement parts

⚠ WARNING

Danger of injury when using incorrect replacement parts!

- ❒ Use only original Froling replacement parts or spare parts approved by Froling.
- ❒ In case of doubt, always contact our customer service.
  - ➥ Hazards for the staff can arise through the use of incorrect or faulty spare parts and cause damage, malfunction or total failure.

Spare parts can be obtained from the manufacturer or importer.

3.11 Environmental protection

NOTICE

Danger to the environment resulting from incorrect handling of environmentally hazardous substances!

- ❒ Always follow the instructions below when handling hazardous substances and their disposal.
- ❒ If hazardous substances are accidentally released into the environment, take appropriate measures immediately. In case of doubt, inform the competent authority about the damage and request that proper measures be taken.
  - ➥ Incorrect handling of environmentally hazardous substances, in particular incorrect disposal, can cause significant damage to the environment.

The following hazardous substances are used:

Ash

Ashes should be placed in a metal container with a tight-fitting lid. The closed container of ashes should be placed on a non-combustible floor on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. For the disposal of ash from the heat exchanger, consult the local chimney sweep or waste disposal service of the municipality or province.

Lubricants

Lubricants such as greases and oils contain poisonous substances. They must not be released into the environment. Disposal must be carried out by a specialist disposal company. Observe the manufacturer’s safety data sheet.

3.12 The operator's responsibilities

Operator

The operator is the person who operates the system for commercial or economic purposes by himself or cedes use to a third party and bears the legal responsibility concerning the product for the protection of the user, staff or third parties during the operation.

Operator duties

The system is used in the commercial sector. The system operator is therefore subject to the legal obligations for safety at work.

In addition to the safety instructions in this manual, the applicable regulations on safety, safety at work and environmental protection must be observed.

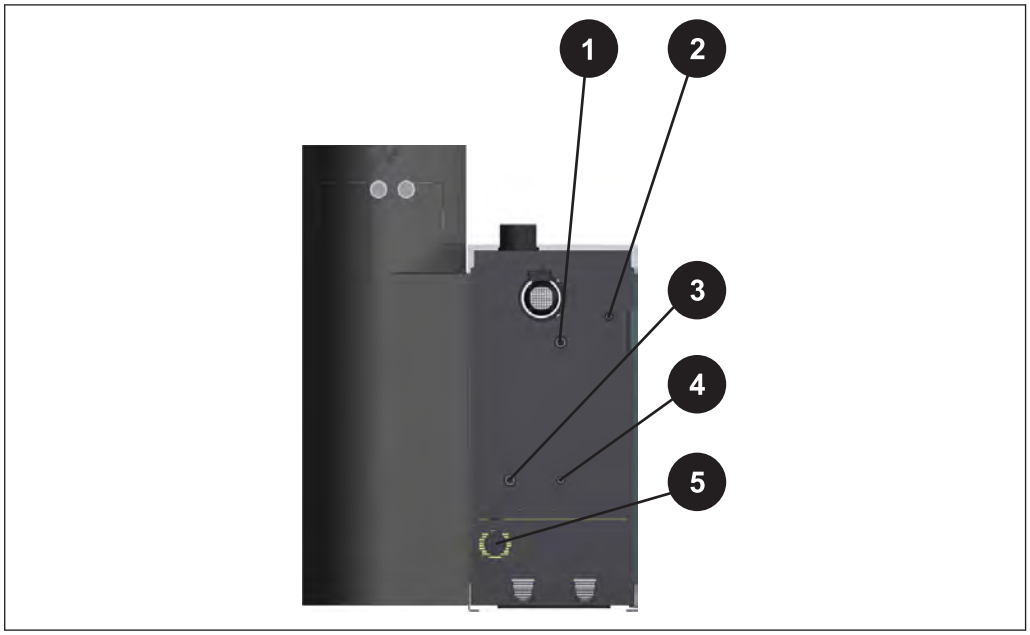
Therefore, in particular, the following applies:

- The "Occupational Safety and Health Act" of 1970 lays down that a safe workplace must be provided at all times during the execution of work.
- The operator must be aware of the applicable occupational safety regulations. Additionally, he must perform a risk assessment to determine hazards arising from special working conditions at the site where the system is used. He must implement these in the form of operating instructions for system operation.
- The operator must check throughout the entire period of use of the system whether the operating instructions created by him correspond to the current version of the regulations, and, if necessary, adjust them.
- The operator must clearly manage and determine the responsibilities for operation, troubleshooting, maintenance and cleaning.
- The operator must ensure that all persons who deal with the system have read and understood this manual. In addition, he must train the staff at regular intervals and inform them about possible dangers. Moreover, the operator must ensure that unauthorized persons do not get close to the system.
- The operator must provide the required protective equipment to staff and instruct them that it is obligatory to wear the necessary protective equipment.
- The operator must ensure that only fuels approved by the manufacturer are used.
- The operator must ensure that the prescribed safety tests are performed.
- The operator must ensure that the regulatory approval requirements are respected.
- The operator must ensure compliance with the requirements of the installation site and the safety measures when working in the storeroom.
- Furthermore, the operator is responsible for ensuring that the system is always in full working order. Therefore the following applies:
- The operator must ensure that the maintenance intervals described in these instructions are respected.
- The operator must ensure that the safety devices are regularly checked for proper functioning and completeness.

4 Description of the boiler

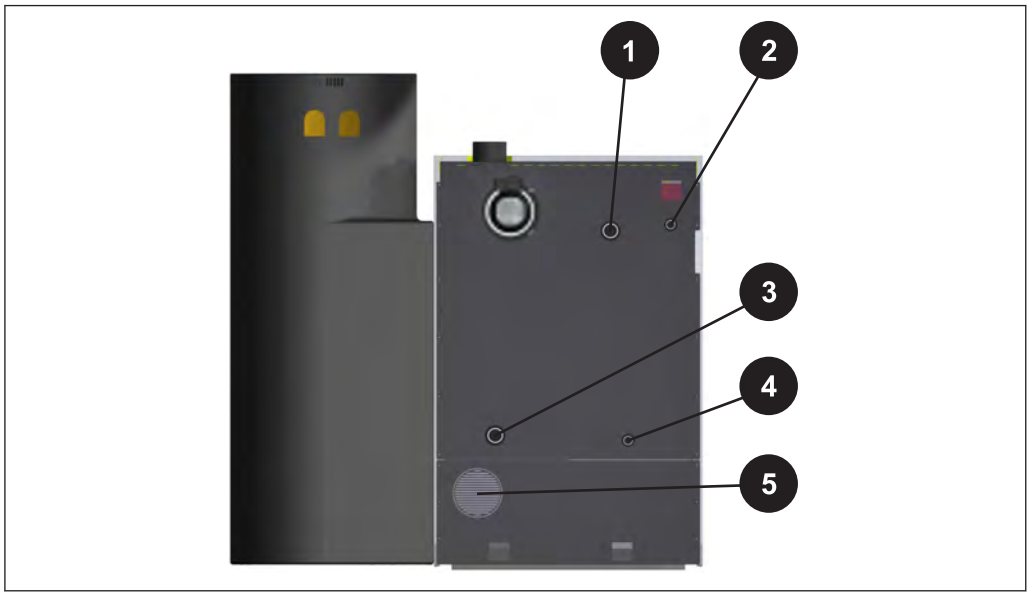
4.1 Back view

4.1.1 P4 Pellet 8-38



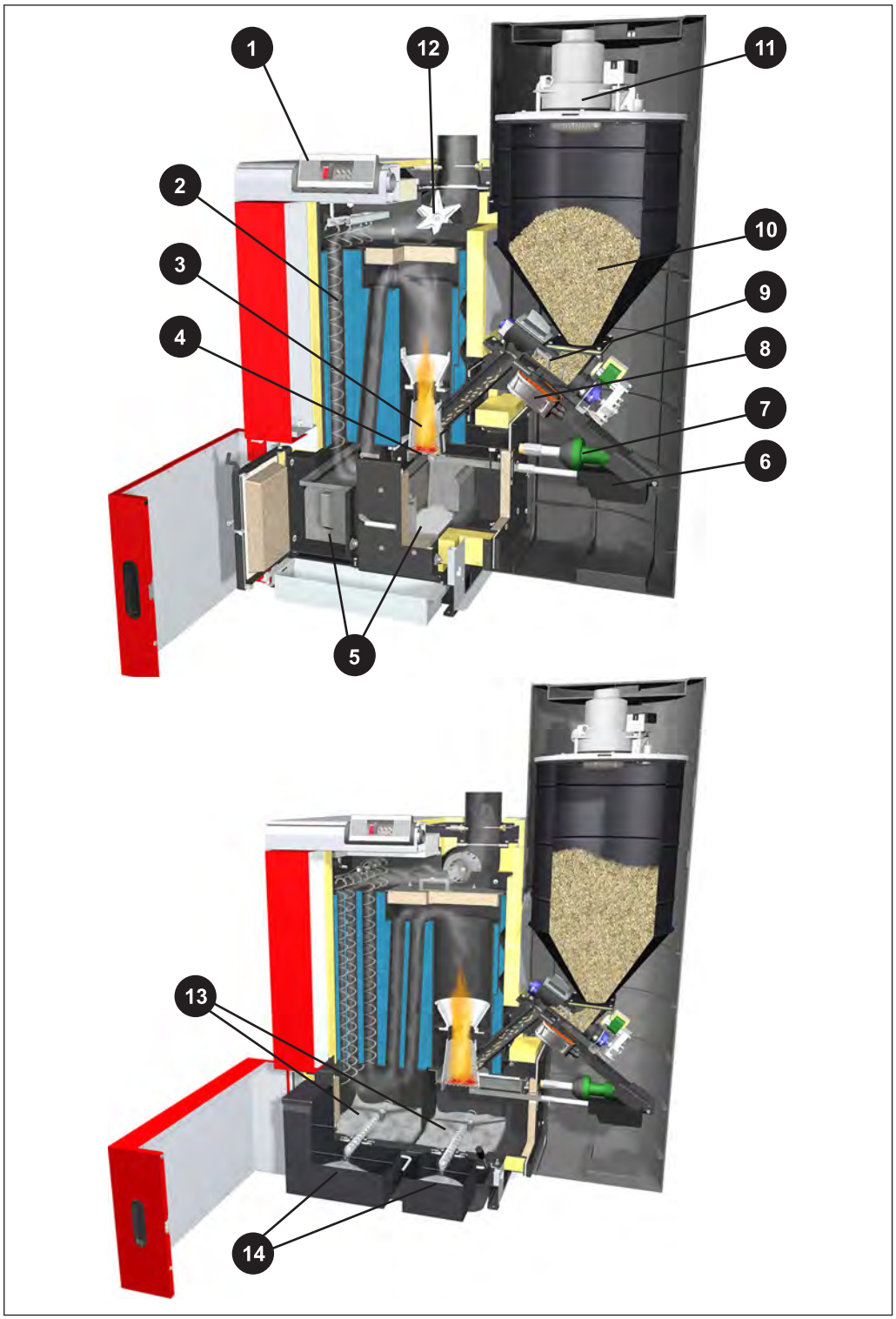
1	Boiler return connection
2	Air vent connection
3	Boiler flow connection
4	Drainage connection
5	Combustion air connection

4.1.2 P4 Pellet 48-100



1	Boiler flow connection
2	Air vent connection
3	Boiler return connection
4	Drainage connection
5	Combustion air connection

4.2 Width



1	Control panel of the Lambdatronic P 3200 Touch control
2	Heat exchanger with integrated spiral springs
3	Steel combustion chamber
4	Combustion grate
5	Comfort ash box (P4 Pellet 8 – 25)
6	Grate output
7	Hot air ignition
8	Burn back flap
9	Stoker screw
10	Hopper
11	Suction turbine
12	Speed-controlled induced draft fan
13	Ash chamber
14	Ash container (P4 Pellet 32-100)

4.3 Functional description

4.3.1 General operation

The P4 Pellet boiler is a boiler that produces useful heat for heating space and preparing hot water. The boiler uses wood pellets for fuel.

The pellets are transported by the suction turbine via the suction hoses from the fuel store into the large hopper. Either suction probes or pellet screws are used as a discharge system.

The pellets are transported to the downpipe with the stoker screw and fall in a metered quantity through the burn back flap onto the combustion grate of the sturdy steel combustion chamber. Hot air is added by the automatic ignition to ignite the pellets.

Together with the speed-controlled induced draft fan and the stoker screw, the broadband Lambda probe ensures optimum combustion.

Heat generated during combustion moves through the steel combustion chamber to the heat exchanger, where it is used for heating the hot water. Ash contained in the flue gas is deposited in the heat exchanger. An efficiency optimization system in the heat exchanger ensures automatic cleaning by means of turbulators (spiral springs) and the ash falls downwards. On the P4 Pellet 8 – 25 there is one comfort ashcan below the heat exchanger and one below the combustion grate. Starting with the P4 Pellet 32 model, the ash falls into the ash chamber, where it is transported via the ash screw into large ash containers.

4.3.2 Operating modes

Winter operation

In the "Winter operation" mode, the boiler runs 24 hours a day and tries to maintain the boiler setpoint temperature set on the control system. The system is shut down for cleaning purposes only.

Transition operation

If the boiler is combined with a storage tank, the "Transition operation" mode must be set. The storage tank is monitored by temperature sensors which are connected to the control system. The boiler only continues to run in transition operation with the storage tank until the water in the storage tank is heated to a preset temperature.

If the "Transition operation" mode is set even though there is no storage tank connected with the boiler, this operating mode is the same as "Winter operation"; in addition, however, a time period can be specified in which the boiler tries to maintain the set boiler setpoint temperature.

Summer operation

The heating circuit controller is deactivated in the "Summer operation" mode; a cold storage tank, if present, is not part of the starting criteria for the boiler. A boiler start requires only a demand for hot water. When the set hot water temperature is achieved, the boiler shuts off again.

4.3.3 Approved fuels

Pellets

Use only wood pellets made of natural wood in accordance with the specifications of the PFI premium quality class like those of the Pellet Fuel Institute (PFI) Standard Specification for residential/commercial densified fuel.

Note on standards

US/CAN: Fuel acc. "Pellet Fuel Institute (PFI) Standard Specification for Residential / Commercial Densified Fuel": Fuel grade: PFI Premium

EU: Fuel as per EN 14961 - Part 2: Wood pellets class A1 / D06

Storeroom

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

5 Transport, installation and commissioning

5.1 Safety

Transport as well as installation and commissioning are carried out exclusively by the manufacturer's employees or staff authorized by the manufacturer.

⚠ WARNING

Risk of death from incorrect transport and faulty installation and commissioning!

- ❒ Transport, installation and commissioning must be carried out exclusively by the manufacturer's employees or staff authorized by the manufacturer.
- ❒ Consult the manufacturer even in case of a subsequent change of location.
- ❒ Refrain from unauthorized transport, unauthorized installation and commissioning, as well as changes of location.
  - ➥ An error during transport and installation/commissioning can lead to perilous situations or cause substantial damage to property.

5.2 Conditions for commissioning

Staff:	❒ Operator
	❒ Froling customer service or an authorized partner
	❒ Chimney sweep
	❒ Licensed electrician
	❒ Heating system installer

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

- Electrical installation
- Installation of water pipes
- Connect flue gas pipes, including all insulation work
- Work must comply with local fire protection regulations

- It is essential that the electrician who 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. This training is provided only once and the respective parties (e.g. operators) must be present for correct customer acceptance of the product.

NOTICE

Escaping condensation during the initial heat-up phase does not indicate a fault.

- ❒ Tip: If this occurs, clean it up with a cleaning rag.

6 Loading fuel

Working in storeroom

⚠ WARNING

Risk of injury when carrying out work in the storeroom!

- ❒ Switch the boiler off at the SPS before entering the storeroom.
- ❒ Switch the main switch off at the control cabinet.
- ❒ Never climb onto piles of fuel.
- ❒ Ensure that there is adequate ventilation when entering the storeroom.
- ❒ For safety reasons never work in the storeroom alone. Take another person with you.
- ❒ Always wear personal protective equipment for work (protective clothing, safety shoes, protective gloves, dust mask, protective goggles).
- ❒ Also observe the information on the notice on the access door to the storeroom.
  - ➥ Piles of fuel (wood chips or pellets) are at risk of caving if you stand on them when working in the storeroom. There is also a risk of poisoning due to an increased concentration of carbon monoxide in the air.

⚠ CAUTION

Filling the fuel store when the boiler is switched on

Could result in damage and consequential injury!

When filling the fuel store:

- ❒ Switch off the boiler by tapping “Boiler OFF”.
  - ➥ The boiler follows the shutdown procedure and switches to "Boiler off" status.
- ❒ Allow the boiler to cool for at least half an hour.

After the boiler has cooled down:

- ❒ Before refilling the fuel store, check for pellet dust and clean if necessary.
- ❒ Close all openings to the fuel store to seal out dust.
- ❒ Fill the fuel store with pellets.
  - ➥ Only use permitted pellets!
    ⇨ See "Approved fuels" [page 46]

6.1 General advice for working in the fuel store

Risk of injury due to moveable parts!
Shut off the feeder unit before entering the fuel store!

When cleaning the fuel store, an increased amount of dust may be generated. Wear a dust mask when working in the fuel store.

Adequately ventilate the fuel store before entering. Keep the door open and always have a second person present. Observe the CO concentration limit (< 30ppm).

Slick surfaces in the fuel store present a slipping hazard!

Unauthorized access prohibited! Keep children away!
Keep the fuel store locked and store the key in a safe place!

No fire, open flames or smoking in the fuel store!

7 Heating the boiler

7.1 Safety instructions for heating

Incorrect operation

⚠ WARNING

Risk of injury due to incorrect operation! Incorrect operation can cause serious injuries and considerable property damage.

- ❒ Perform all operating steps according to the information and instructions in this manual.
- ❒ Only trained staff may carry out work to the system.
- ❒ Check the system externally for any visible damage or defects at least once a day.
- ❒ Before starting work, make sure that all covers and safety devices are installed and work properly.
- ❒ Never disable or bypass safety equipment during operation.
- ❒ Refrain from modifying the control software.

7.2 Switching on

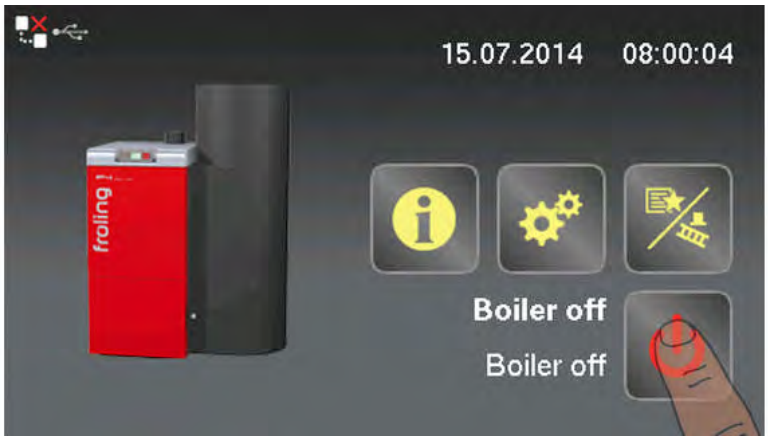
7.2.1 Turn on the main switch

Staff:	❒ Operator

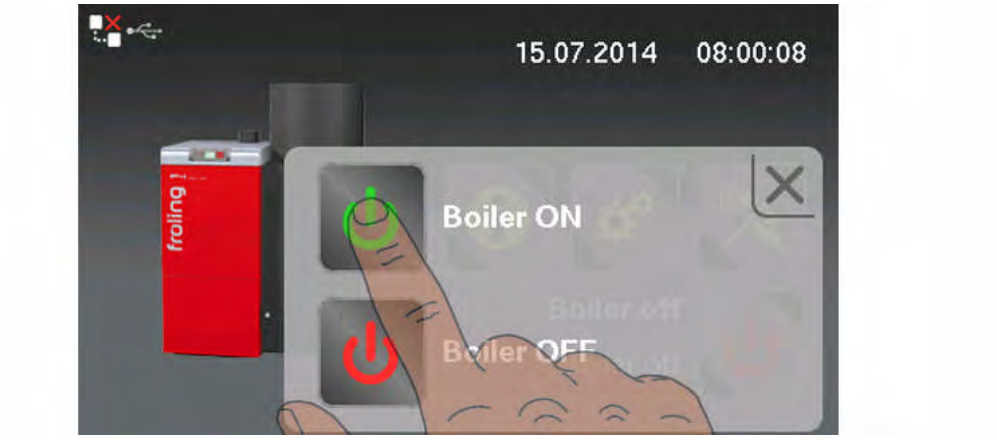
- ❒ Switch on the main switch located under the upper insulating cover.
  ➥ The control system boots and the basic display appears on the control panel.

7.2.2 Switch the boiler on at the control system.

Staff	❒ Operator



- ❒ Select the "ON/OFF symbol" in the basic display.



❒ Turn the boiler on using the "BOILER ON" command.
➥ Boiler is switched on. The boiler system is controlled according to the set operating mode and time period.

7.2.3 Operation via the control system

Safety instructions for the control system

Incorrect operation

⚠ WARNING

Risk of injury from operating the system incorrectly!

❒ Modifications to the control system must only be undertaken in consultation with the manufacturer.
➥ Modifying parameters on the control system can cause malfunctions.

Switching off the main switch prematurely

⚠ WARNING

When turning off the main switch in automatic mode:

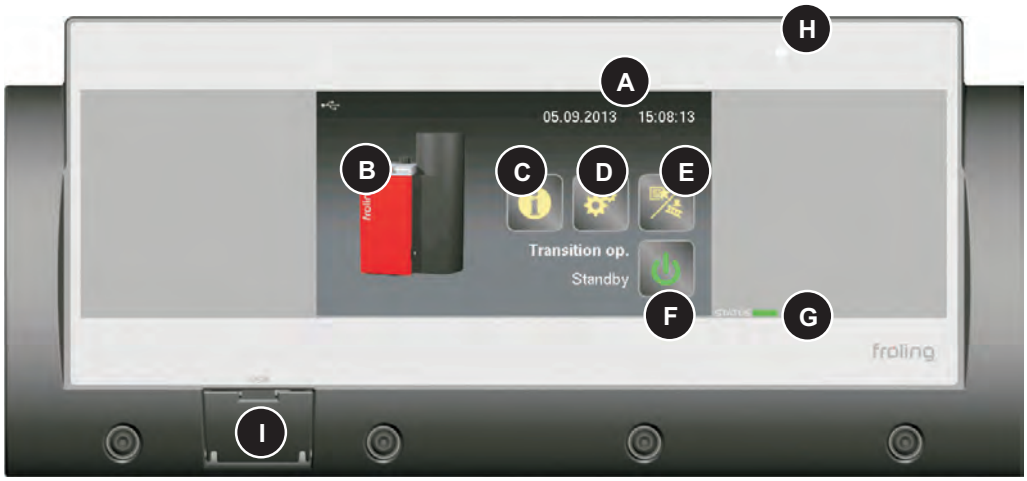
Serious combustion faults leading to serious accidents are possible.

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.

Overview of the basic screen

Visual display



A	Date and time display
B	Image of set boiler type
C	Info menu icon for viewing all system information
D	System menu icon for opening the system settings. All parameters can be displayed/ edited depending on the user level
E	Quick menu icon for viewing the available quick functions
F	Mode icon for switching the boiler on/off Switching the boiler on/off
G	Status LED for displaying the current operating status
H	Brightness sensor for automatically adjusting the display brightness
I	USB port for connecting a USB stick for software updates

Status LED

The status LED shows the operating status of the system:

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

Control icons

Cancel icon

Discards any values entered without saving and closes messages.

Confirm icon

Confirms any values entered and activates parameters.

Home icon

Tapping the Home icon takes you back to the basic display from any menu.

Info menu icon

To access all system information. The information is ordered in a circular buffer. The right and left arrows are used to switch between the individual pages.

Quick menu icon

Opens the quick menu. Various functions are available depending on the user level, system configuration and current status.

Pen icon

If a parameter has the pen symbol beside it, it means that the parameter can be adjusted. If you open the parameter, either the numeric keypad or a list box for changing the value of the parameter will appear.

System menu icon

Opens the system settings. Depending on the operating level and system configuration, the various menu items available are organized in a circular buffer which can be navigated using the right and left arrow.

Back icon

Takes you back up one menu level of the system menu. Can be used to return to the basic display.

Display icons

Depending on the selected settings and current status, additional icons may be shown in the upper left section of the display. Tapping the upper left display section takes the user to the “Connection Center”. Here the online portal “froeling-connect.com” can be activated or deactivated.

froeling-connect.com is not in use or was deactivated by the user.

Command server error; a connection with the froeling-connect.com server was not able to be established.

Connection with the froeling-connect.com server is being established.

froeling-connect.com is available.

Remote control of the boiler can also be activated or deactivated in the “Connection Center”. The prerequisite is that the parameter “`Remote control of the boiler can be activated`” is set to “YES” in the menu “`System selection`” under “`Boiler remote control`”.

Boiler remote control

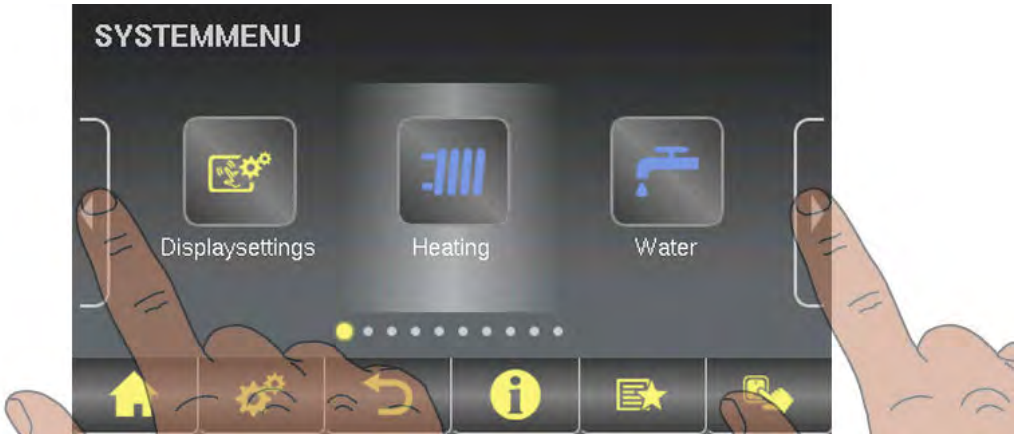
Remote control (switching the boiler on and off) by external operators via froeling-connect.com is permitted.

Remote control (switching the boiler on and off) by external operators via froeling-connect.com is not permitted.

Navigation

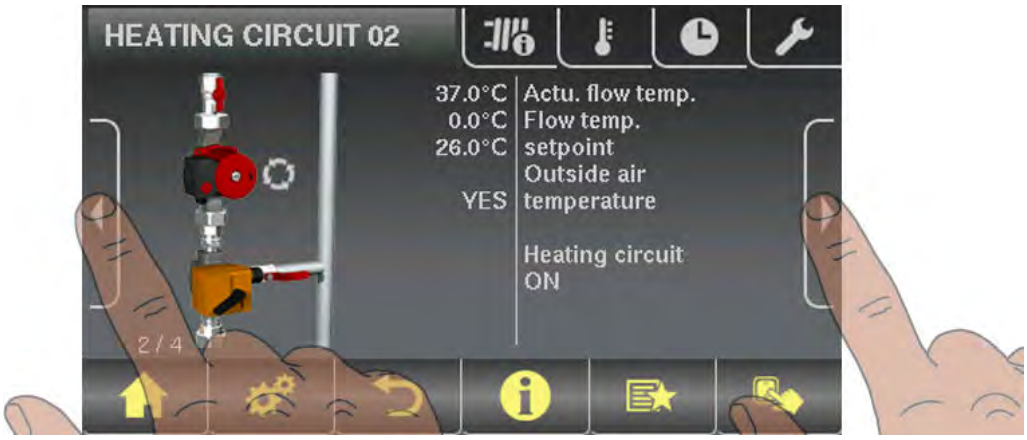
Navigation within the system menu

The system menu shows the menu items available depending on the user level and the system configuration. Tap the icon to open the corresponding menu item. The system menu is structured in a circular buffer, which can be navigated using the right and left arrows. The next time you open the system menu, the last page viewed will be displayed.



Navigating the menus

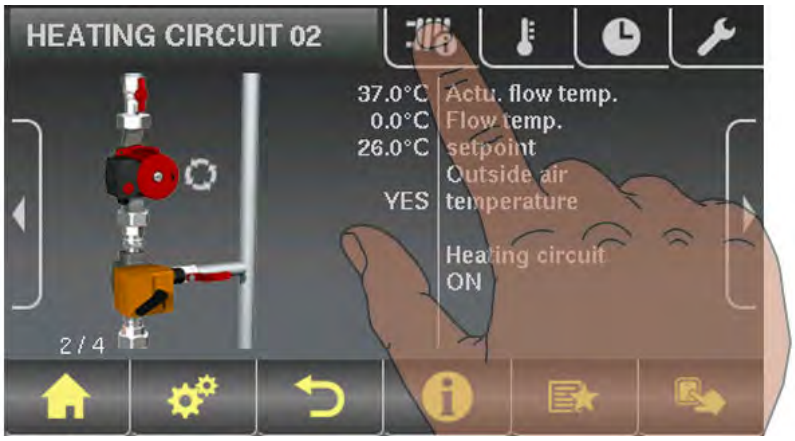
After you open a menu item, the corresponding status display with current values will appear. If, for example, several heating circuits are installed, you can use the right and left arrows to navigate to the desired heating circuit. You can open any other menu items available in the same way.



The individual menus are divided into tabs for quicker navigation.

❒ Tap on the desired tab

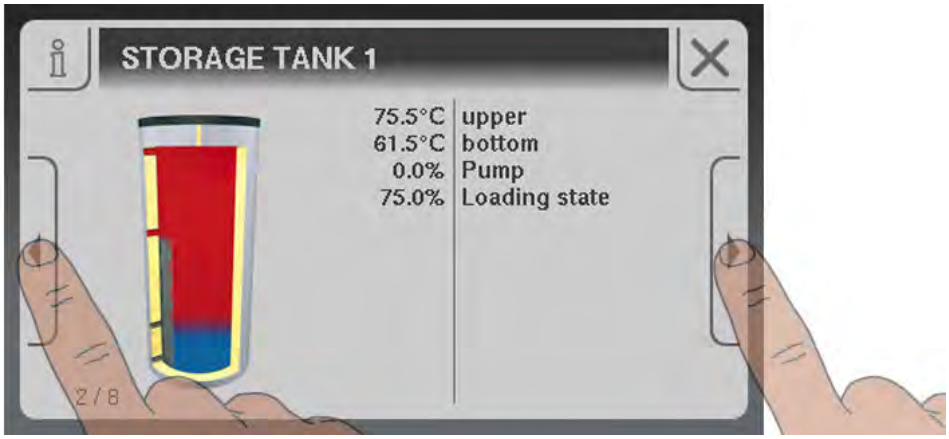
➥ The list of parameters for the selected area will appear



The parameter list shows three parameters. The up and down arrows can be used to scroll through longer lists of parameters. If you have reached the start or end of the parameter list, the relevant arrow symbol will become inactive.

Navigation within the info menu

The info menu displays all the information about the system. Use the right and left arrows to go to the individual menu items for the relevant information. The next time you open the info menu, the last page viewed will be displayed.



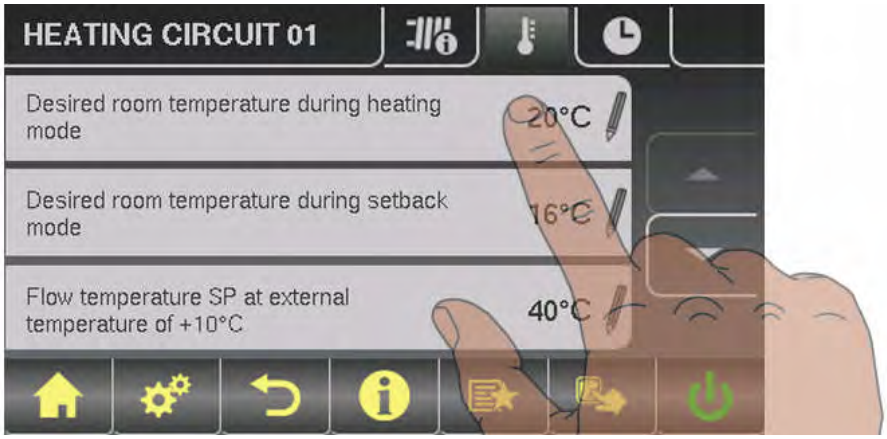
Procedure for changing parameters

Select the parameter

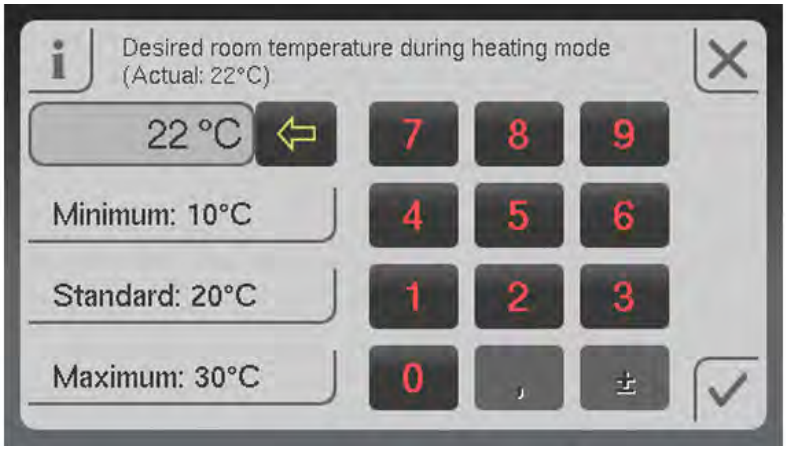
Staff:	❒ Operator

It is only possible to edit parameters if there is a "pen icon" beside the parameter value.

❒ Select the desired parameter



↪ The selected parameter will open for editing.



Adjusting parameters

There are different ways of entering values depending on the type of parameter:

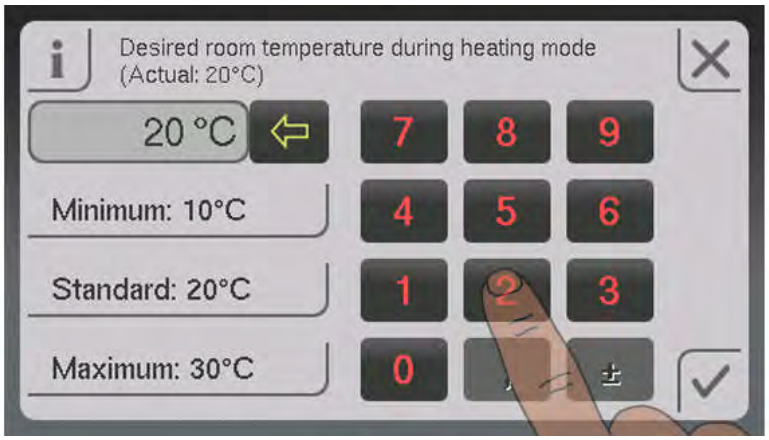
- Enter the value using the numeric keypad.
- Predefined value.
- Select the parameter value from a list box.

In each case, you need to tap the confirm icon to save the entry.

Enter the value using the numeric keypad.

Staff:	❒ Operator

If a numeric keypad appears beside the parameter in the display field, you can enter the value directly.

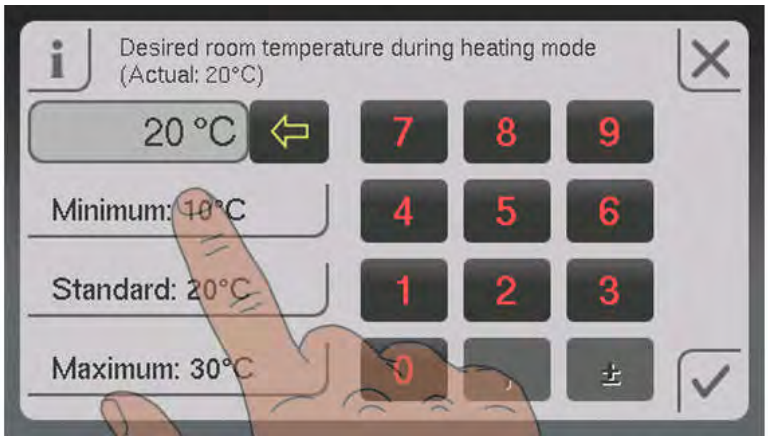


❒ Type in the relevant value on the numeric keypad.
❒ Save your entry by tapping the *"confirm icon"*.

Selecting a predefined value

Staff:	❒ Operator

Below the parameter value, predefined values ("Minimum, "Standard" and "Maximum") are shown as buttons.

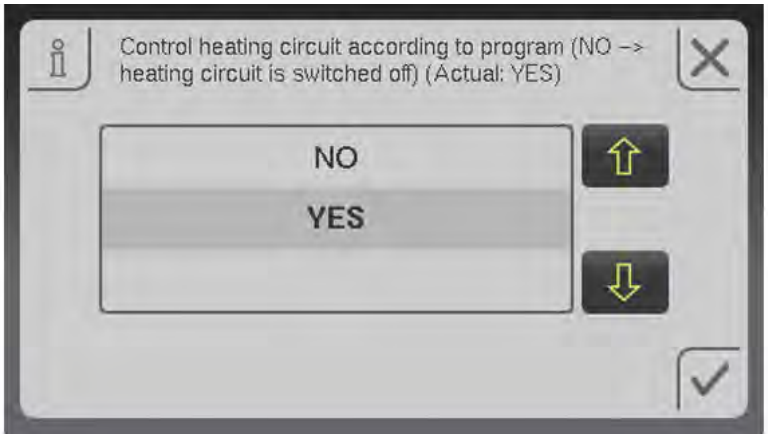


❒ Tap the desired predefined value.
➥ The parameter value is accepted in the value box.
❒ Save your entry by tapping the *"confirm icon"*.

Selecting a parameter value from the list box

Staff:	❒ Operator

Depending on the parameter type, values must be selected from a list box.

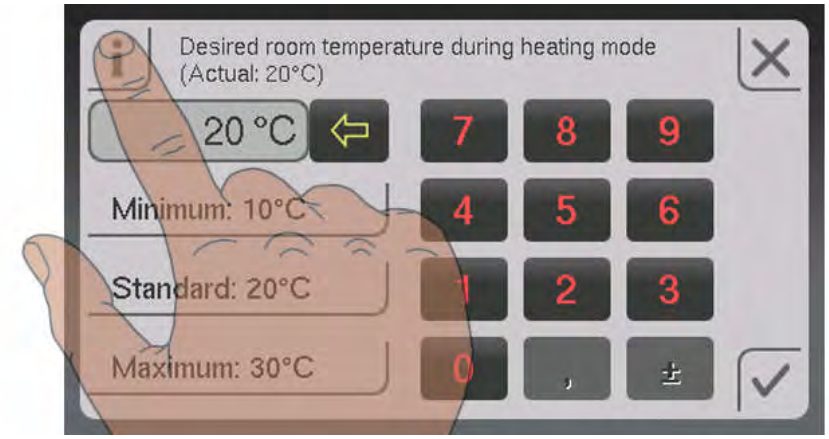


❒ Select the desired value in the list box.
❒ Save your entry by tapping the *"confirm icon"*.

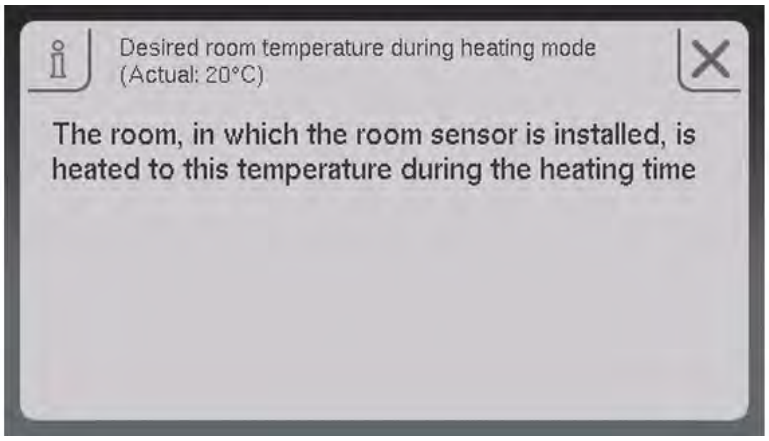
Displaying parameter info

Staff: ❒ Operator

❒ Tap the *"Info icon"* in the parameter view.



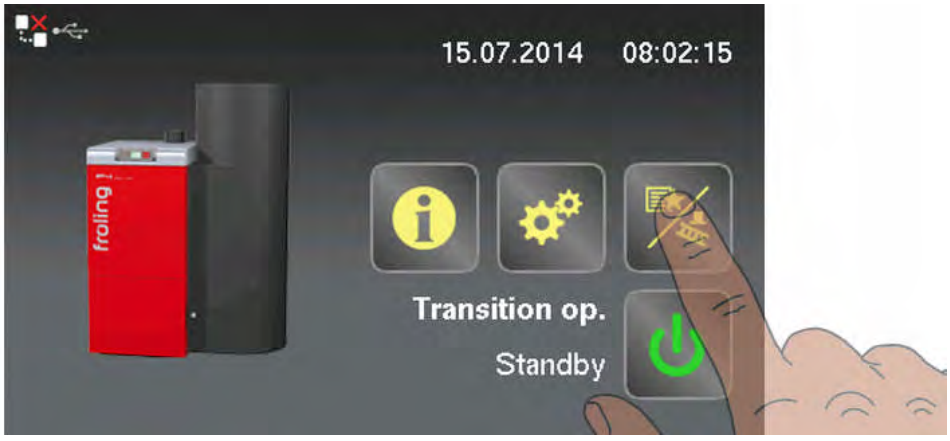
➥ The info view opens.



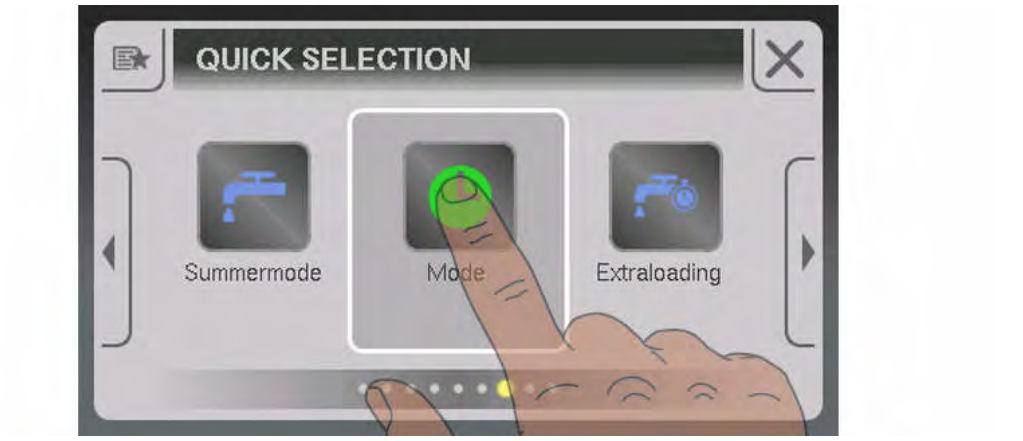
The info view shows a description of the parameter in continuous text.

Setting the operating mode

Staff: ❒ Operator



❒ Tap the *"Quick menu icon"* in the basic display.



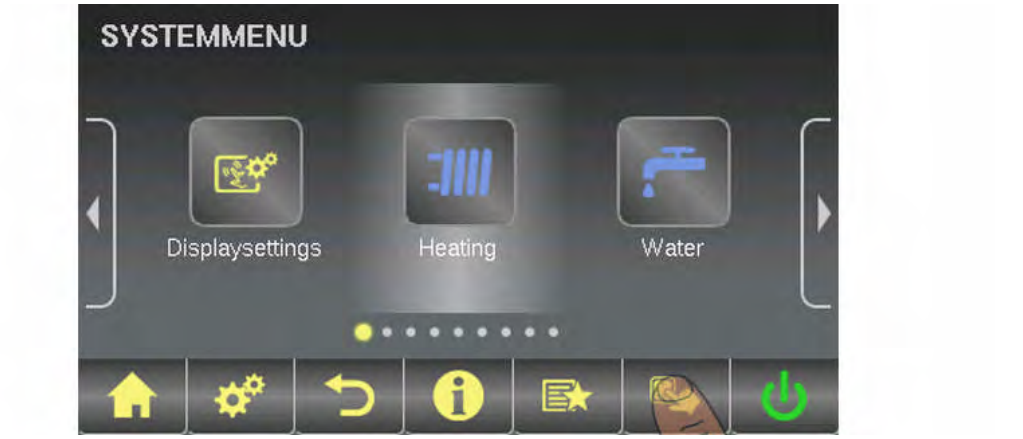
❒ Tap "*Mode in automatic mode*" in the quick menu.

❒ Select the desired operating mode in the list box.
❒ Save your entry by tapping the *“confirm icon"*.

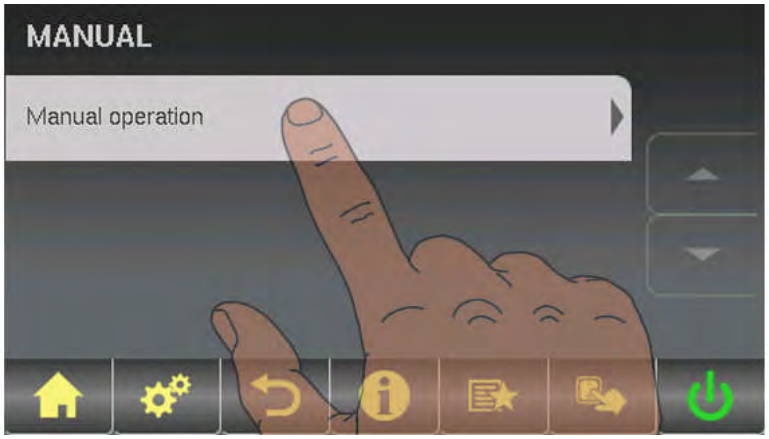
Activating manual operation

Staff:	❒ Operator

No matter where you are in the menu, you can open the "Manual" menu from an icon in the bottom menu bar.

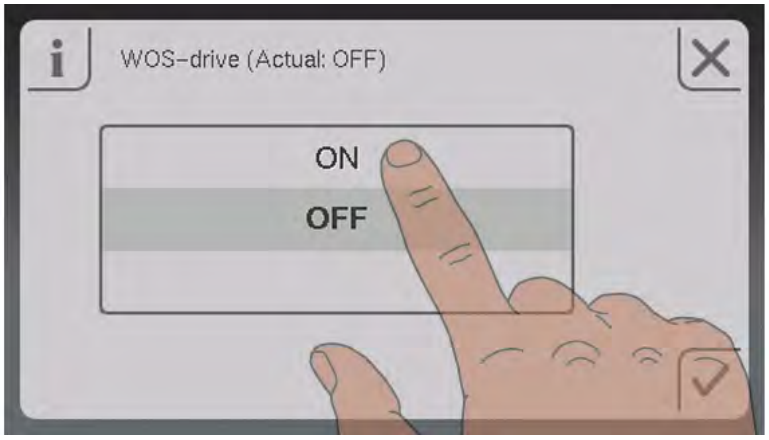


❒ Call up the "Manual" menu.



❒ In the "Manual" menu, call up the "Manual operation" submenu.

❒ Navigate to the desired function using the *"up arrow"* or *"down arrow"* and tap the function to call it.

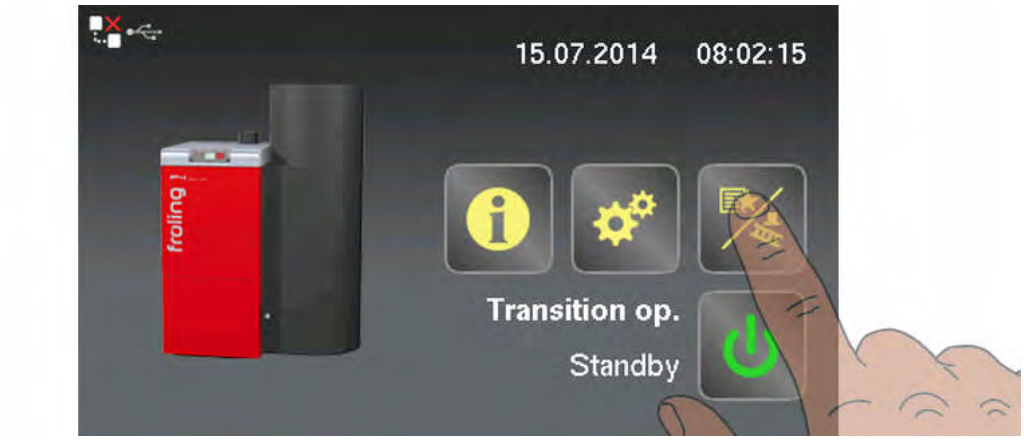


❒ Tap *"ON"* to activate the function.

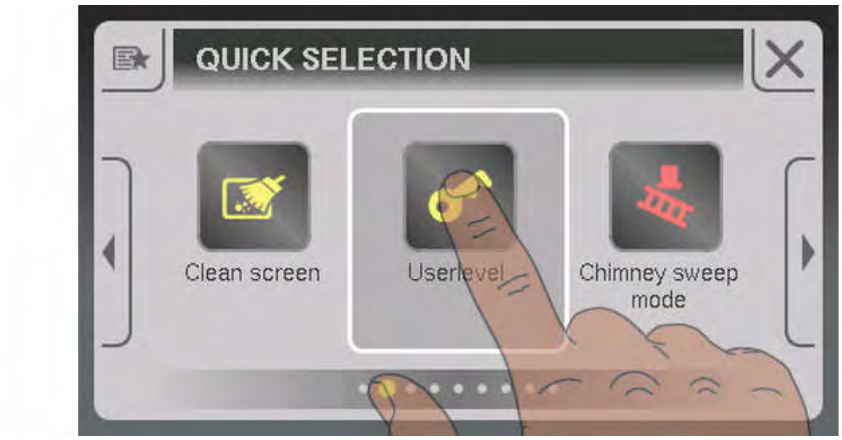
↪ The drive is configured to the specified value set in the respective menu. The function will remain active until the process is ended by tapping *"OFF"* or the "Manual" menu is closed.

Switching user level

Staff:	❒ Operator

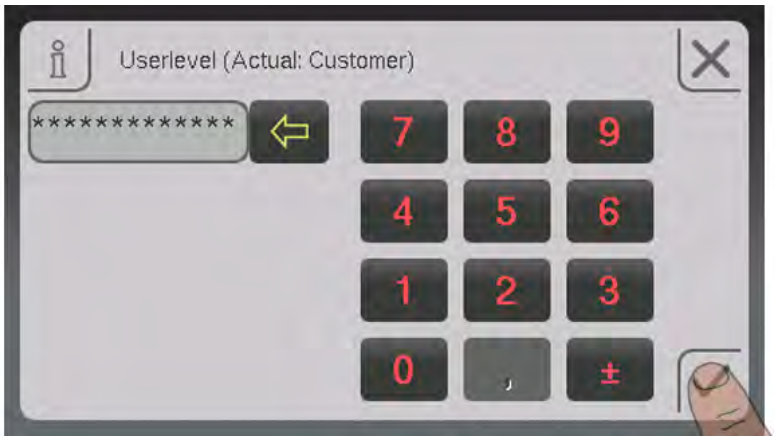


❒ Tap the *"Quick menu icon"* in the basic display.



❒ Navigate to the User level icon using the *"left arrow"* or *"right arrow"* in the quick menu.

❒ Open the input field for the user code by tapping the *"User level icon"*.



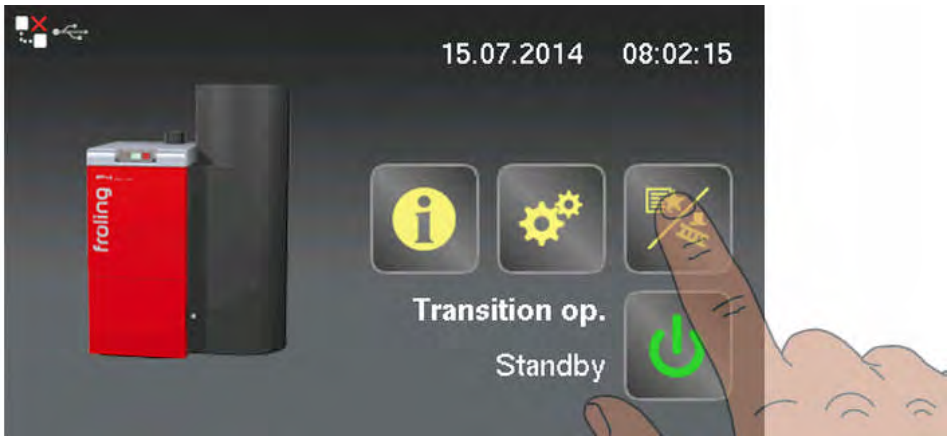
❒ Enter the user code using the numeric keypad and confirm by tapping the *"Confirm icon"*.

Once you have entered and confirmed the relevant user code, the number of functions available will vary. The “installer" and “service" user levels are also shown on the basic display above the quick menu icon.

Operating level	Description
Child lock (Code 0)	At “Child lock” level, only the “Status” menu appears. It is not possible to change parameters at this level.
Customer (Code 1)	Standard level for normal operation of the touch display. All customer-specific parameters are displayed and can be changed.
Installer / Service	Releases parameters to adjust the controller to the system components (if configured).

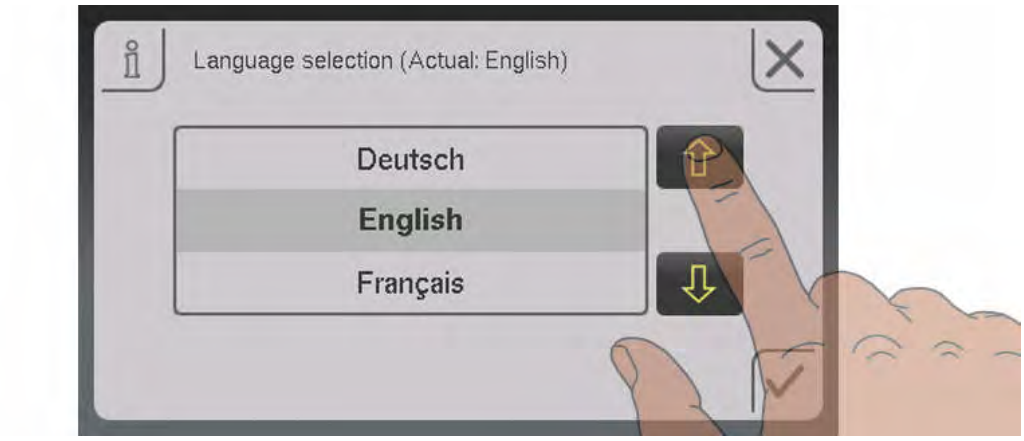
Changing the language

Staff: ❒ Operator



❒ Tap the *"Quick menu icon"* in the basic display.

❒ Navigate to the language icon using the *"left arrow"* or *"right arrow"*.
❒ Select the language menu using the *"language icon"*.

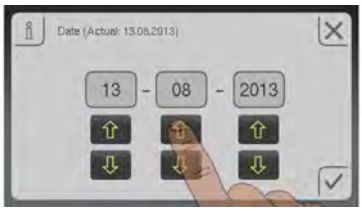


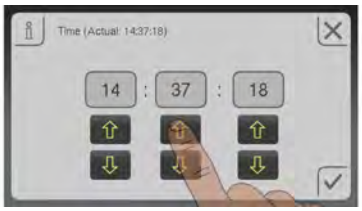
❒ Select the desired language using the *"up arrow"* or *"down arrow"*.
❒ Confirm your setting by tapping the *"Confirm icon"*.

Setting the date/time

❒ To set / adjust the date and time displayed, tap on the date/time at the top right of the basic display.

❒ A menu will then appear allowing you to adjust the date and time. To apply the new values you need to confirm the date and time by tapping the “confirm” icon.



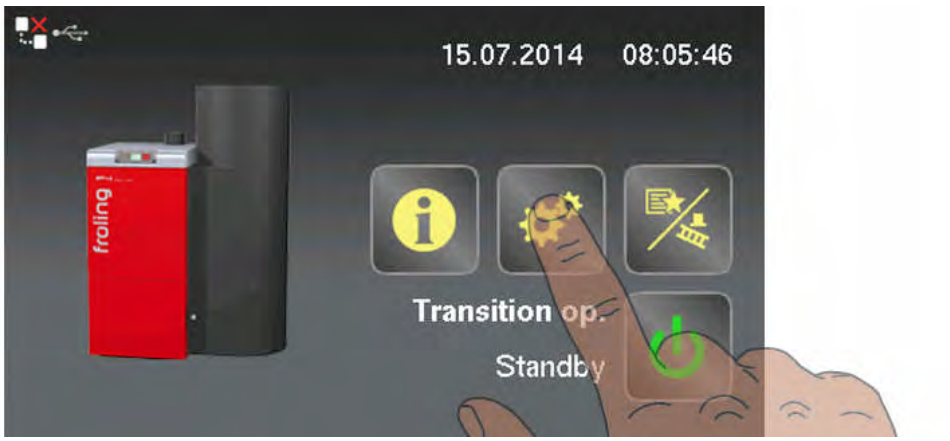


Setting heating times

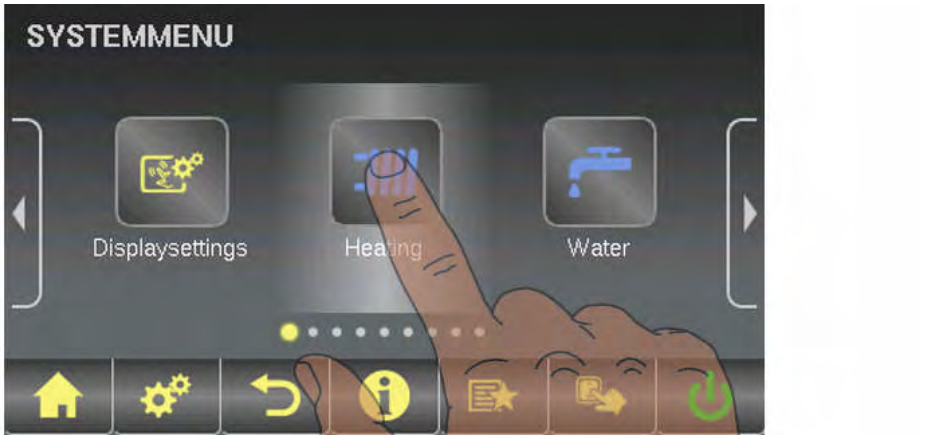
The desired time window for the component can be set in the "Times" tab in the individual menus of the heating components (e.g. heating). The structure of the time menu and the procedure for changing the times are always the same.

Staff: ❒ Operator

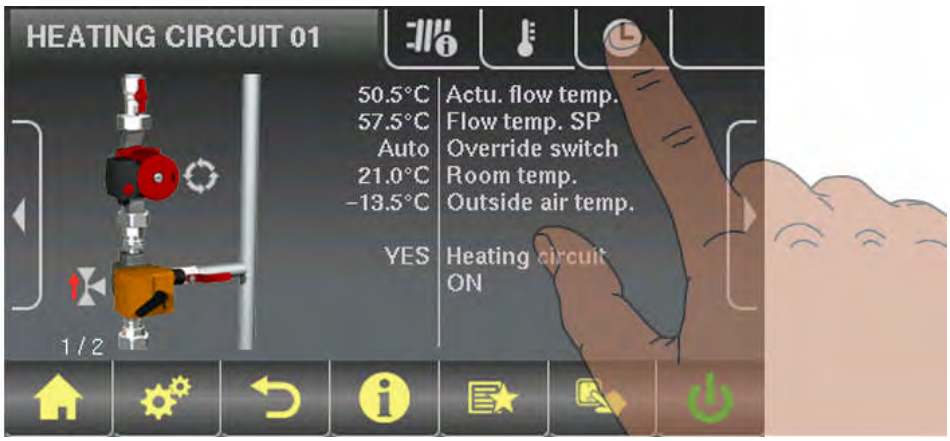
❒ Select the *"System menu icon"* in the basic display.



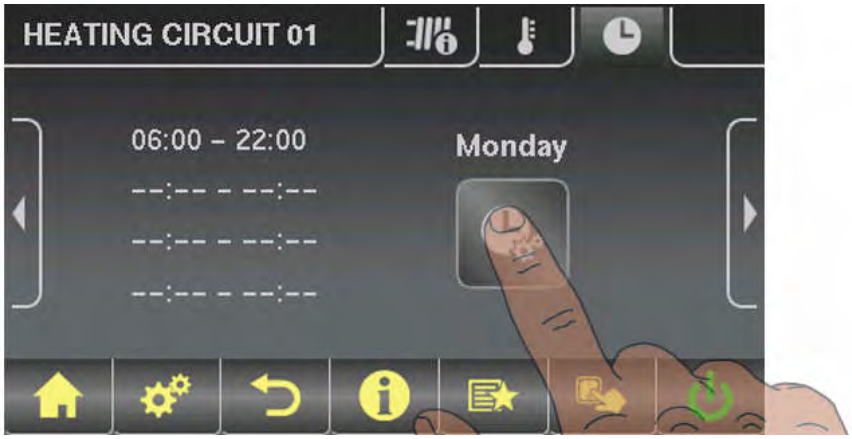
❒ In the system menu, select *"Heating"*.



❒ Select the *"Times"* tab in the *"Heating"* window.

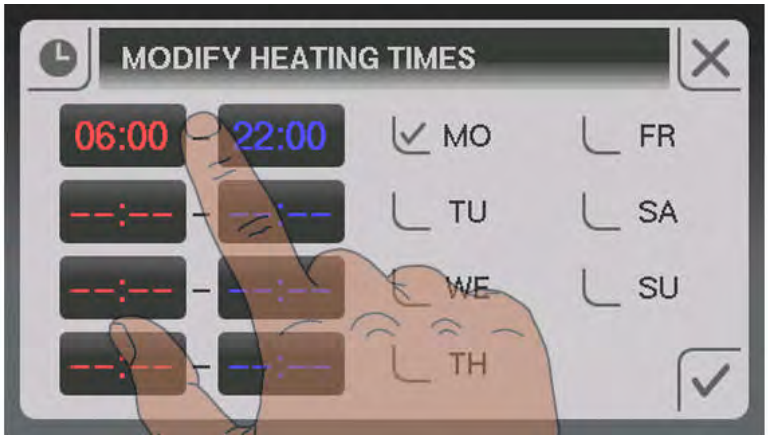


❒ Navigate to the desired day of the week using the *"right arrow"* or *"left arrow"* and tap the time period to edit.



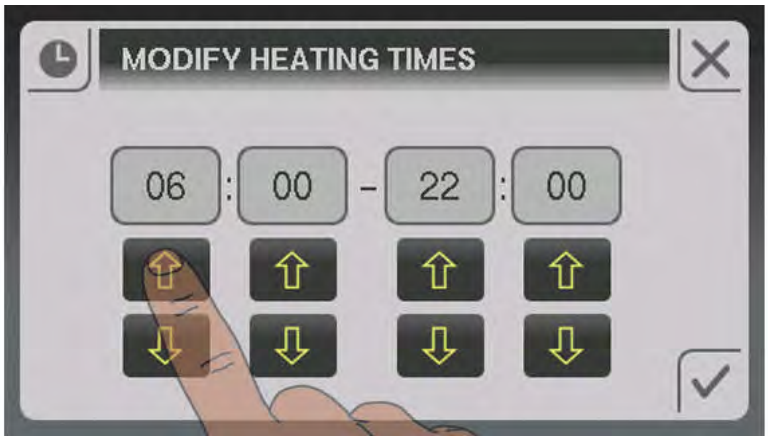
❒ Tap the relevant time window with a maximum of four times.

➥ An editing window will appear.



❒ Set the start and end time for the time window using the *"up arrow"* and *"down arrow"*.

➥ The hours and minutes are set separately for each time.

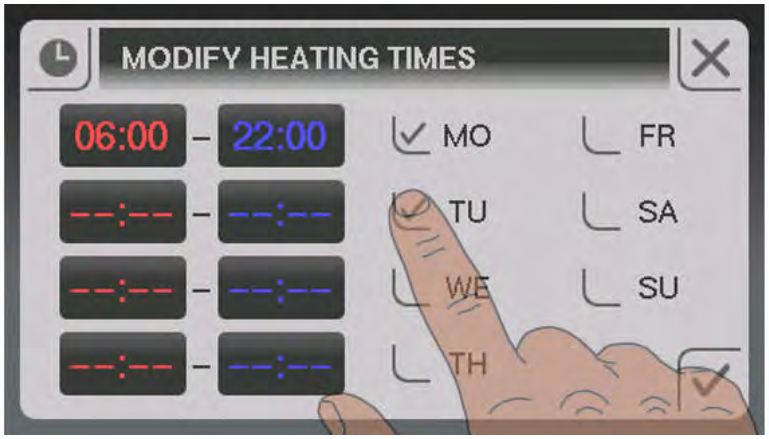


❒ Apply the set time window by tapping the *"Confirm icon"*.

Applying the time setting for several days

The heating times set for one certain day can be applied to several days:

❒ Tap the desired day with the set heating times and tap the *"confirm icon"* to transfer it to additional days.



Changing the hot water temperature

The desired temperature for the component can be set in the "Temperatures" tab in the individual menus of the heating components (e.g. DHW tank). The structure of the menu and the procedure for changing the temperature are always the same.

Staff:	❒ Operator

Hot media

⚠ WARNING

Risk of scalding from hot media!

❒ Temperature modifications in the control system must only be undertaken in consultation with the manufacturer.

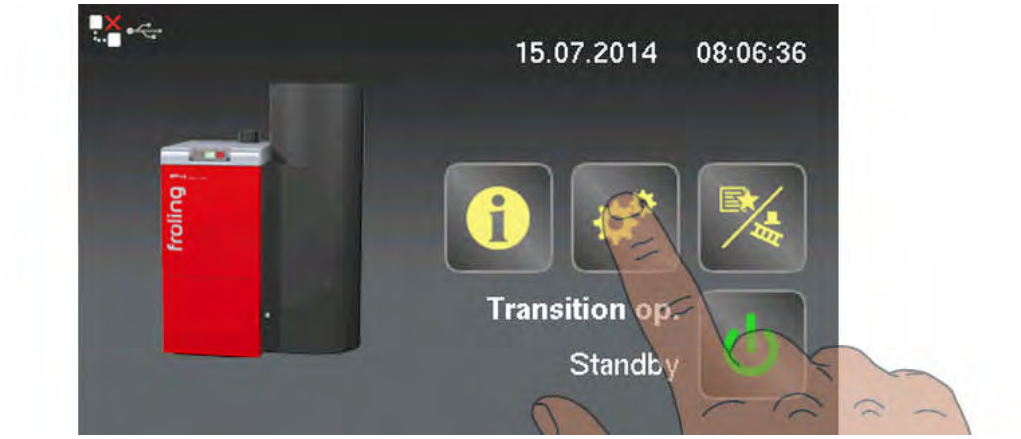
❒ Do not touch heating pipes and consumer loads in the heating circuit (radiator etc.) during operation.

❒ Allow the system to cool before carrying out any maintenance work. Always wear protective gloves when working on the system.

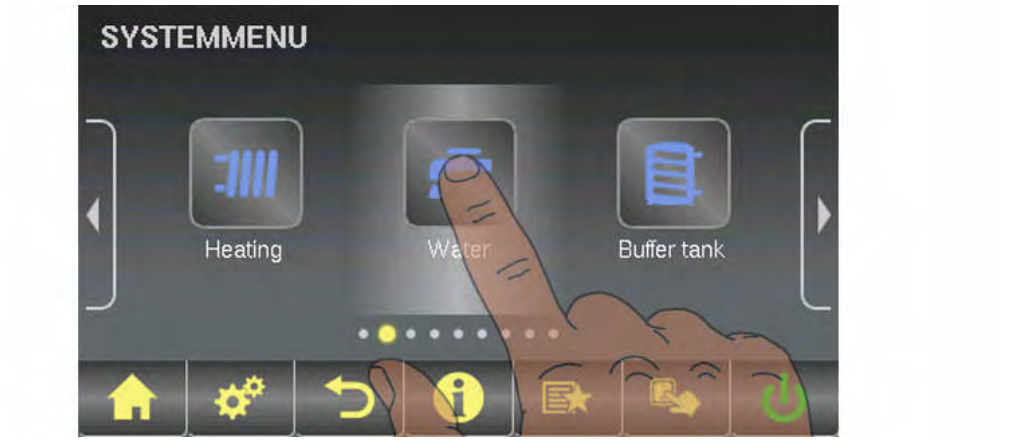
❒ Keep children and unauthorized persons away from the heating system.

↪ Heating pipes and consumer loads in the heating circuit can heat up considerably from the hot water. An incorrect setting in the control system means that the water obtained can be extremely hot. Contact with hot water or hot surfaces can cause scalding to skin.

❒ Select the *"System menu icon"* in the basic display.



❒ In the system menu, select *"Water"*.



❒ Select the *"Temperatures"* tab in the *"Water"* window.

Editable parameters are marked with the "pencil icon".

❒ Select the *"DHW setpoint"* parameter.

➥ The detailed view of the selected parameter will open.

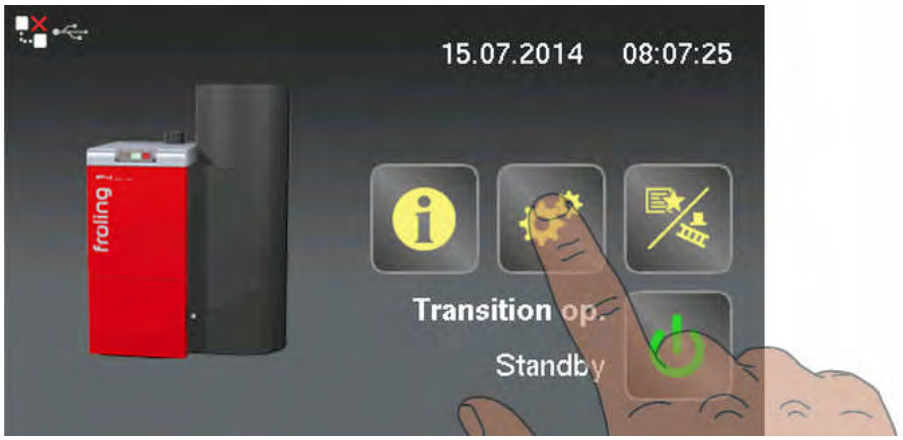
❒ Set parameters.
❒ Save your entry with the *“confirm icon"*.

Changing the heating circuit temperatures

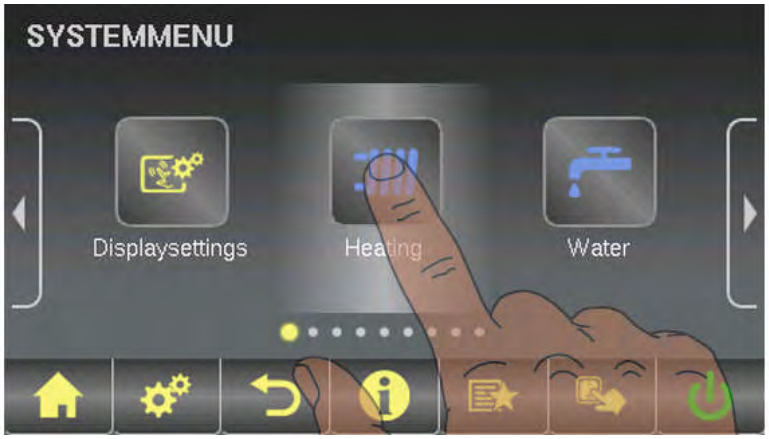
The desired time window for the component can be set in the "Temperature" tab in the individual menus of the heating components (e.g. heating). The structure of the menu and the procedure for changing the temperature are always the same.

Staff:	❒ Operator

❒ Select the *"System menu icon"* in the basic display.



❒ In the system menu, select *"Heating"*.

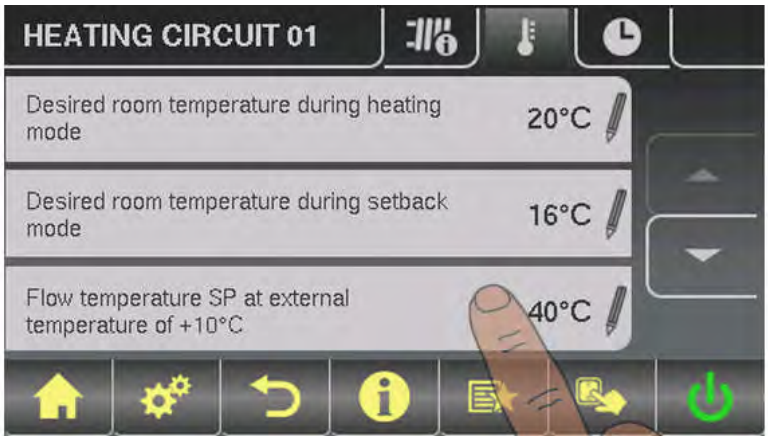


❒ Select the *"Temperatures"* tab in the *"Heating"* window.

Editable parameters are marked with the "pencil icon".

❒ Select the desired parameter.

➥ The detailed view of the selected parameter will open.



❒ Set the parameter by using the arrow keys, the numeric keypad or the specified values.

❒ Confirm the set temperature by tapping the *"Confirm icon"*.

Requesting statuses

Staff:	❒ Operator

❒ Open the basic display on the control.

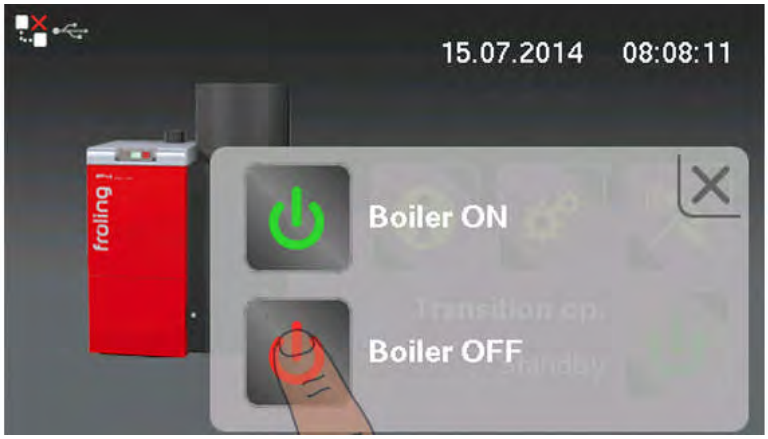
The current mode and the current operating status are displayed in the basic display of the control system. The current status will show on the display depending on the operation that the boiler is currently performing. In this example, the boiler is in transition operation and ready for use.

7.2.4 Switching off

Switch the boiler off using the control system.

Staff:	❒ Operator

❒ Select the *"ON/OFF symbol"* in the basic display.



❒ Switch the boiler off via *"BOILER OFF"*.

➥ The control system shuts down the boiler according to procedure. After the shut down procedure, the boiler switches to "Switched off - Boiler off" status. The control system controls the connected heating system. All parts of the boiler are deactivated. The chamber discharge unit and the entire hydraulic system remain active.

Turning off the main switch

Staff:	❒ Operator

❒ Switch off the boiler via the *"ON/OFF icon"* by tapping *"Boiler OFF"* on the basic display of the control system.

➥ The boiler is shut down according to procedure and starts with the cleaning cycle.

❒ Allow the boiler to cool sufficiently.

❒ Switch off the main switch located under the upper insulating cover.

➥ The power of the system is switched off.

➥ **NOTICE! Risk of frost! When the main switch is off, the frost protection function is no longer active!**

7.2.5 Emptying the ash container

The ash drawers (P4 Pellet 8-25) or ash container (P4 Pellet 32) must be emptied at intervals according to energy requirements and pellet quality.

Hot ashes

⚠ WARNING

Risk of injury from hot ashes!

- ❒ Always wear protective clothing and protective gloves when working on the system.
- ❒ Before handling ash, check whether or not it is still hot. Allow to cool if necessary.
  - ➥ Ash is extremely hot after the combustion process. Contact can cause serious burns.

Emptying the ash container (P4 Pellet 8-25)

- ❒ Open the insulated door and position the ash drawer below the ash doors to catch any ash that might overflow.
- ❒ Open ash doors.

- ❒ Pull the ash drawer out slightly.
  - ➥ This pushes the ash lying in front of the drawer into the ash bowl.
- ❒ Put the transport cover on as illustrated and pull out the ash drawer until the transport cover engages.

- ❒ Take the ashcan to the emptying point and empty it.
  - ➥ Push up the locking lever to remove the transport cover!

NOTICE

Ashes should be placed in a metal container with a tight-fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Other waste shall not be placed in this container.

Emptying the ash container (starting with P4 Pellet 32)

❒ Open the insulated door and push the locking lever up.
❒ Pull out the ash container and put the cover plate provided onto the flange of the ash container.

❒ Take the ash container to the emptying point and empty it.
➥ To remove the cover, the clamp must be unlocked and opened.

8 Maintaining the boiler

8.1 Safety instructions for maintenance

Automatic start-up

⚠ WARNING

Risk of injury from automatic start-up!

- ❒ Before doing any work, switch the boiler off at the control system.
- ❒ Switch off the main switch and take precautions to prevent accidental switching on.
  - ➥ There is a risk of serious injury from the system starting up automatically if it is switched on during inspection and cleaning.

Risk of injury due to improperly performed maintenance work!

⚠ WARNING

Risk of injury due to improperly performed maintenance work!

- ❒ Before starting any work, switch the boiler off using the control system. Allow the boiler to cool sufficiently. Once the boiler has cooled down, switch off the main switch and take precautions to prevent accidental switching on.
- ❒ Only operate the boiler using the handles provided.
- ❒ Perform all inspection and cleaning work to the boiler in the proper way.
- ❒ Pay attention to order and cleanliness in the boiler room.
- ❒ Any maintenance work not permitted for the operator must be carried out exclusively by Froling customer service or an authorized partner.
- ❒ Always wear personal protective equipment for work (protective clothing, safety shoes, protective gloves, dust mask, protective goggles).
- ❒ Before starting up again, make sure that there is no-one in the danger zone and that all covers and safety devices are installed and work properly.
- ❒ THE HEAT EXCHANGER, DRAFT INDUCER, FLUE PIPE, AND CHIMNEY MUST BE CLEANED REGULARLY TO REMOVE ACCUMULATED CREOSOTE AND ASH. ENSURE THAT THE HEAT EXCHANGER, FLUE PIPE, AND CHIMNEY ARE CLEANED AT THE END OF HEATING SEASON TO MINIMIZE CORROSION DURING THE SUMMER MONTHS. THE APPLIANCE, FLUE PIPE, AND CHIMNEY MUST BE IN GOOD CONDITION. THESE INSTRUCTIONS ALSO APPLY TO A DRAFT INDUCER IF USED.
  - ➥ Incorrect or insufficient inspection and cleaning of the boiler can cause serious faults in combustion (e.g. spontaneous combustion of carbonization gases or explosion) and this can lead to serious accidents and damage.

8.2 Maintenance schedule

Interval	Maintenance work	Staff
Every 100 operating hours	Visually inspect the system	Operator
	Check that safety equipment is functioning properly	Operator
Twice a month during the heating period	Remove soot, anthracene oil and ash deposits from the chimney connection and chimney	Chimney sweep
After every operating period of 2000 hours or once a year	Check the grate and combustion chamber	Froling customer service or an authorized partner
	Check the downpipe for dirt (P4 Pellet 48 and up)	Froling customer service or an authorized partner
	Cleaning the flue gas collection chamber and the heat exchanger	Froling customer service or an authorized partner
	Clean WOS	Froling customer service or an authorized partner
	Clean the induced draft fan	Froling customer service or an authorized partner
	Clean the flue gas temperature sensor	Froling customer service or an authorized partner
	Clean the broadband probe	Froling customer service or an authorized partner

8.3 Maintenance work

8.3.1 Carrying out a visual inspection

Staff:	❒ Operator
Protective equipment:	❒ Protective workwear ❒ Protective gloves ❒ Safety shoes

The operator must check the system at regular intervals. If you detect a damage, contact Froling customer service or an authorized partner immediately.

- ❒ Check the quantity of fuel in the fuel store.
- ❒ Check the fuel supply to the boiler.
- ❒ Visually inspect the seal on the boiler's geared motors.

There should be no significant leakage of lubricant. The presence of a few drops of lubricant may be normal. If a significant quantity of lubricant is leaking, immediately inform the heating system installer, Froling customer service or an authorized partner.

8.3.2 Checking the safety equipment

Staff:	❒ Operator
Protective equipment:	❒ Protective workwear ❒ Protective gloves ❒ Safety shoes

Emergency stop button

- ❒ Check the emergency-stop button for proper function (if present).

STL (high-limit thermostat)

- ❒ Check the high-limit thermostat.

Safety valve

- ❒ Check the safety valve in the heating circuit.

System pressure

- ❒ Check the system pressure on the pressure gauge.

Check that the position of the pressure gauge and rated pressure of the expansion tank match your heating system installer's specifications.

- ❒ If the system pressure is low, the heating system installer must refill water and check the heating system for leaks.
- ❒ In case of large pressure fluctuations, ask the heating system installer to inspect the expansion tank.

8.3.3 Disposing of ash

Staff:	❒ Operator
Protective equipment:	❒ Protective workwear ❒ Protective goggles ❒ Protective gloves ❒ Safety shoes ❒ Dust mask

NOTICE

Environmental damage due to improper disposal!

- ❒ Collect ash in a metal container with a tight-fitting cover until its final disposal.
- ❒ Use metal containers exclusively for ash.
  - ➥ The improper disposal of ash can lead to environmental damage.
- ❒ Carry or push the ash container to the metal container.
- ❒ Open the cover of the metal container.
- ❒ Empty the ash container.
- ❒ Close the cover of the metal container again.

Ashes should be places in a metal container with a tight-fitting lid. The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally dispersed, they should be retained in the closed container until all cinders have thoroughly cooled. Other waste should not be placed in this container.

⚠ WARNING

Soot and flyash – Formation and Need for Removal

The products of combustion will contain small particles of flyash. The flyash will collect in the exhaust venting system and restrict the flow of the flue gases. Incomplete combustion, such as occurs during start-up, shut-down, or incorrect operation of the heater will lead to some soot formation which will collect in the exhaust venting system. The exhaust venting system should be inspected at least once every year to determine if cleaning is necessary.

- ❒ Establish a routine for the storage of fuel, care of the appliance, and firing techniques.
- ❒ Check daily for creosote buildup until experience shows how often cleaning is necessary.
- ❒ Be aware that the hotter the fire, the less creosote is deposited, and that weekly cleanings can be necessary in mild weather, even though monthly cleanings can be enough in the coldest months.
- ❒ Have a clearly understood plan to handle a chimney fire.

⚠ WARNING

Creosote – Formation and Need for Removal
When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to from creosote. The creosote vapors condense in the relatively cold chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue linig. When ignited this creosote makes an extremely hot fire. The chimney connector and chimney should be inspected at least twice monthly during the heating season to determine if a creosote buildup has occured.
If creosote has accumulated it should be removed to reduce the risk of a chimney fire.

8.4 After maintenance

After completion of maintenance work and before switching on the system perform the following steps:

- ❒ Check that all previously loosened screw connections are tightened.
- ❒ Check whether all previously removed safety devices and open doors and covers are closed again properly.
- ❒ Make sure that all tools, materials and other equipment used have been removed from the work area.
- ❒ Clean the work area and remove any substances that may have leaked such as liquids, processing materials or similar.
- ❒ Make sure that all safety devices on the system are functioning properly.

9 Boiler faults

9.1 Safety instructions for troubleshooting

Improperly performed troubleshooting operations

⚠ WARNING

Risk of injury due to incorrect troubleshooting!

- ❒ Before starting work, ensure that there is sufficient space for assembly.
- ❒ Pay attention to order and cleanliness at the assembly site. Loosely overlapping or scattered components and tools are sources of accident.
- ❒ If components have been removed, pay attention to correct assembly, refit all fasteners and observe tightening torques for screws.
- ❒ Do not release the blockage until you have ensured that the release will not lead to a dangerous movement of system components.
- ❒ Do not acknowledge the fault until it is eliminated or its cause is resolved.
- ❒ In case of doubt contact Froling customer service.
- ❒ Before starting up again, please note the following:
  - ➥ Make sure that all troubleshooting operations have been performed and completed according to the instructions in this manual.
  - ➥ Make sure that there is no-one in the danger zone.
  - ➥ Make sure that all covers and safety devices are installed and work properly.
  - ➥ Improperly performed troubleshooting operations can cause serious injuries and considerable property damage.

9.2 Fault messages

Faults that occur are displayed on the basic display of the control system. The fault messages are divided into categories and marked in different colors. The faults are marked with a number and the date and time when they occurred.

If there is a fault that has not yet been eliminated, a warning symbol blinks in the basic display on the quick menu icon.

Calling up fault messages

❒ In the basic display, select the *"Quick menu icon"* to open the available quick functions.

❒ Select the *"Error display"* menu in the quick menu.

➥ The current fault list is displayed.

Acknowledging a fault message

Tap on the fault message to display additional information in the "Error display" menu.

❒ Open the current fault list.

❒ Tap on the fault message to acknowledge it.

Once all faults have been eliminated and acknowledged, the warning symbol will disappear from the basic display.

Fault message categories

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

Type of fault	Character	Boiler behavior
WARNING	Status LED: YELLOW	In case of warnings, the boiler initially continues controlled operation, giving the option of resolving the error quickly to prevent a shutdown.
ERROR	Status LED: Orange	The boiler follows shutdown procedure and remains in "Boiler off" status until the problem is resolved.
ALARM	Status LED: Red	An alarm triggers a system emergency stop. The boiler shuts down immediately; the heating circuit controller and pumps remain active.

9.3 Table for troubleshooting

Fault description	Cause	Remedy	Staff
Nothing is shown on the display	General power failure	Check power supply and, if necessary, restart boiler.	Operator
No power to the control system	▪ Main switch is turned off	▪ Turn on the main switch	Operator
	▪ FI-protective circuit breaker, power line protection tripped	▪ Switch the protective circuit breaker on the control cabinet back on.	Operator
High-limit thermostat has activated.	Over-temperature	❒ Allow system to cool. ❒ Check status of the system (note the fault messages). ❒ Reset the high-limit thermostat.	Operator
System does not start.	Insufficient combustion air	Check the air inlet to the boiler room and clean, if necessary.	Operator
	Covers on the boiler not closed	Check the covers and close, if necessary.	Operator
Boiler combustion fault	Insufficient chimney escape due to deposits in the chimney	Have a chimney sweep clean soot, ash and tar oil deposits from the chimney connection and chimney.	Chimney sweep

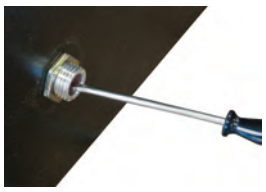
9.4 Operations for troubleshooting

9.4.1 Reset the high-limit thermostat.

Staff:	❒ Operator
Protective equipment:	❒ Protective workwear ❒ Protective gloves ❒ Safety shoes
Special tools:	❒ Screwdriver

The high-limit thermostat switches off the boiler at a temperature of 203-212°F (95-100°C). The pumps continue to run.

Once the temperature falls below approx. 185°F (approx. 85°C), the high-limit thermostat can be reset mechanically.



❒ Unscrew the cap of the high-limit thermostat.
❒ Unlock the high-limit thermostat by pressing with a screwdriver.
❒ Refit the cap of the high-limit thermostat.

9.5 After troubleshooting

Once the fault is eliminated, perform the following steps to start the boiler up again:

❒ Reset the emergency stop devices.
❒ Acknowledge the fault message via the control system.
❒ Make sure that there is no one in the danger zone.
❒ Start according to the instructions in the "Operation” chapter.

10 Dismantling and disposal

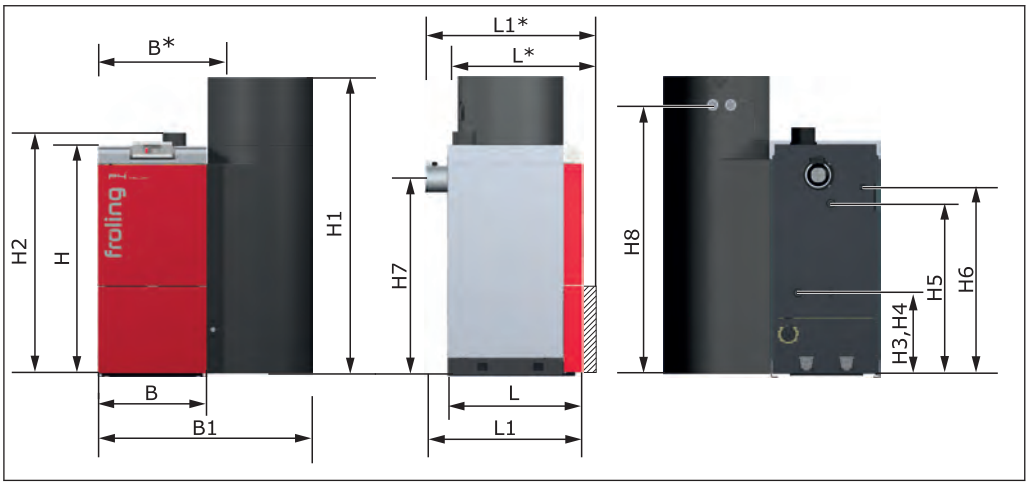
⚠ WARNING

Risk of death from improper dismantling!

- ❒ Dismantling must be carried out exclusively by employees of the manufacturer or staff authorized by the manufacturer.
- ❒ Consult the manufacturer even in case of a subsequent relocation.
- ❒ Refrain from unauthorized dismantling and relocation.
  - ➥ An error during dismantling can lead to life-threatening situations or cause substantial damage to property.

11 Technology

11.1 Dimensions P4 Pellet 8-38



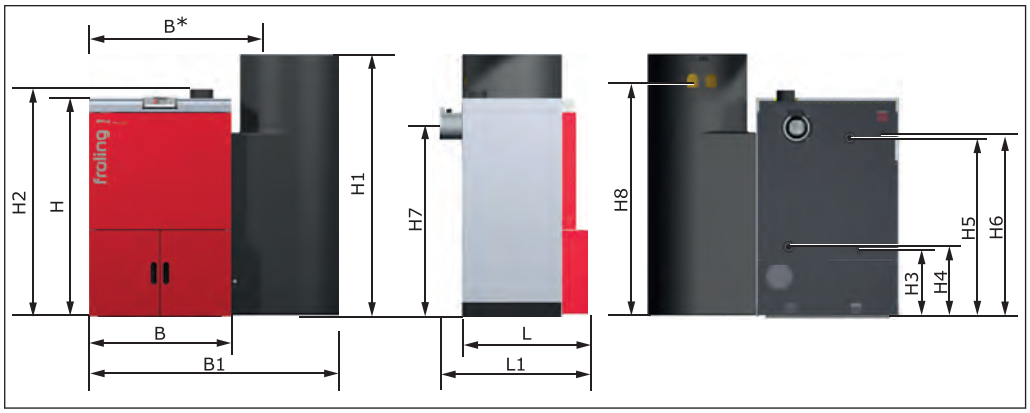
Item	Description	Unit	8 - 15	20 - 25	32 - 38
L	Length, boiler	mm	740	740	-
L*	Length, boiler	mm	-	-	820
L1	Total length incl. induced draught fan	mm	940	940	-
L1*	Total length incl. induced draught fan	mm	-	-	1020
B	Width, boiler	mm	600	770	860
B*	Width, boiler, incl. support for positioning unit [1)]	mm	705	875	965
B1	Total width including suction cyclone	mm	1185	1355	1445
H	Height, boiler [2)]	mm	1280	1280	1430
H1	Total height incl. suction cyclone	mm	1660	1660	1900
H2	Height, flue gas pipe connection	mm	1350	1350	1530
H3	Height, drainage connection	mm	460	460	460
H4	Height, flow connection	mm	460	460	460
H5	Height, return connection	mm	940	955	1085
H6	Height, ventilation connection	mm	1030	1030	1155
H7	Height, induced draught fan connection	mm	1090	1090	1215
H8	Height, suction system connection	mm	1480	1480	1720

1. Corresponds to the minimum positioning width after removing the stoker assembly, suction cyclone and positioning unit
2. Corresponds to the minimum positioning height after removing the stoker assembly, suction cyclone and positioning unit

11.2 Dimensions P4 Pellet 48-100

NOTICE

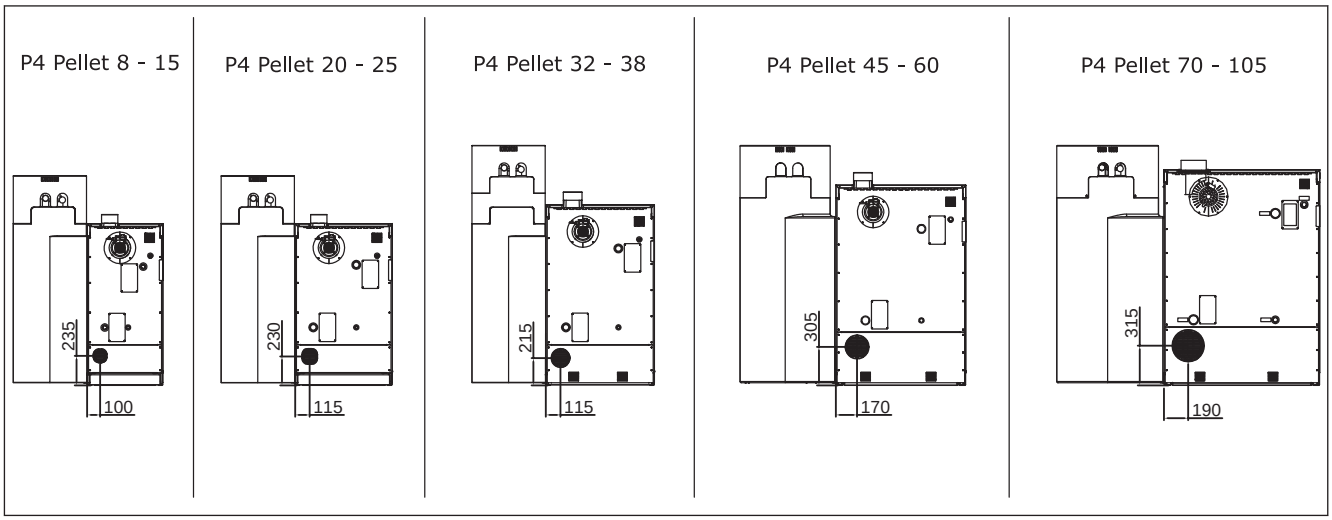
CAUTION: Note the modified flow connection / return connection starting with P4 Pellet 48!



Item	Description	Unit	48 - 60	80 - 100
L	Length, boiler	mm	900	1000
L1	Total length incl. induced draft fan	mm	1100	1070
B	Width, boiler	mm	1030	1235
B*	Width, boiler incl. support for positioning unit [1)]	mm	1275	1480
W1	Total width incl. suction cyclone	mm	1790	2085
H	Height, boiler [2)]	mm	1585	1710
H1	Total height incl. suction cyclone	mm	1900	1900
H2	Height, flue gas pipe connection	mm	1685	1785
H3	Height of drainage connection	mm	490	500
H4	Height, return connection	mm	515	520
H5	Height of flow connection	mm	1290	1410
H6	Height, ventilation connection	mm	1310	1430
H7	Height, ID fan connection	mm	1375	1495
H8	Height, suction system connection	mm	1720	1720

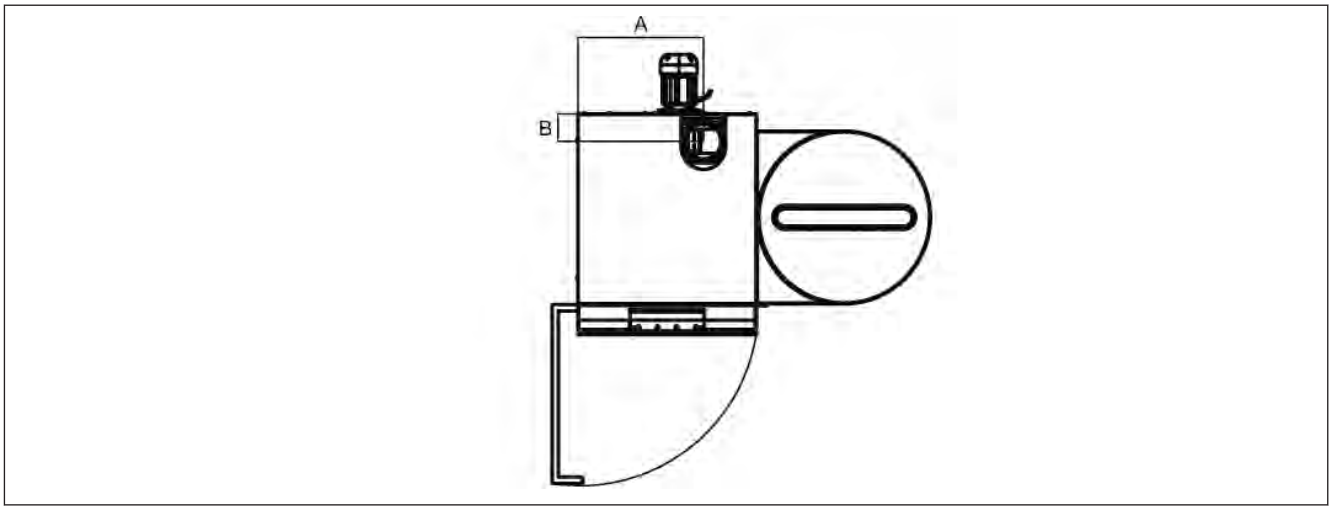
1. Corresponds to the minimum positioning width after removing the stoker assembly, suction cyclone and positioning unit
2. Corresponds to the minimum positioning height after removing the stoker assembly, suction cyclone and positioning unit

11.3 Supply air connections for room air-independent operation



Description	Unit	8/15	20/25	32/38	48/60	80/100
Supply air connection pipe (external diameter)	mm	80	100	125	160	200

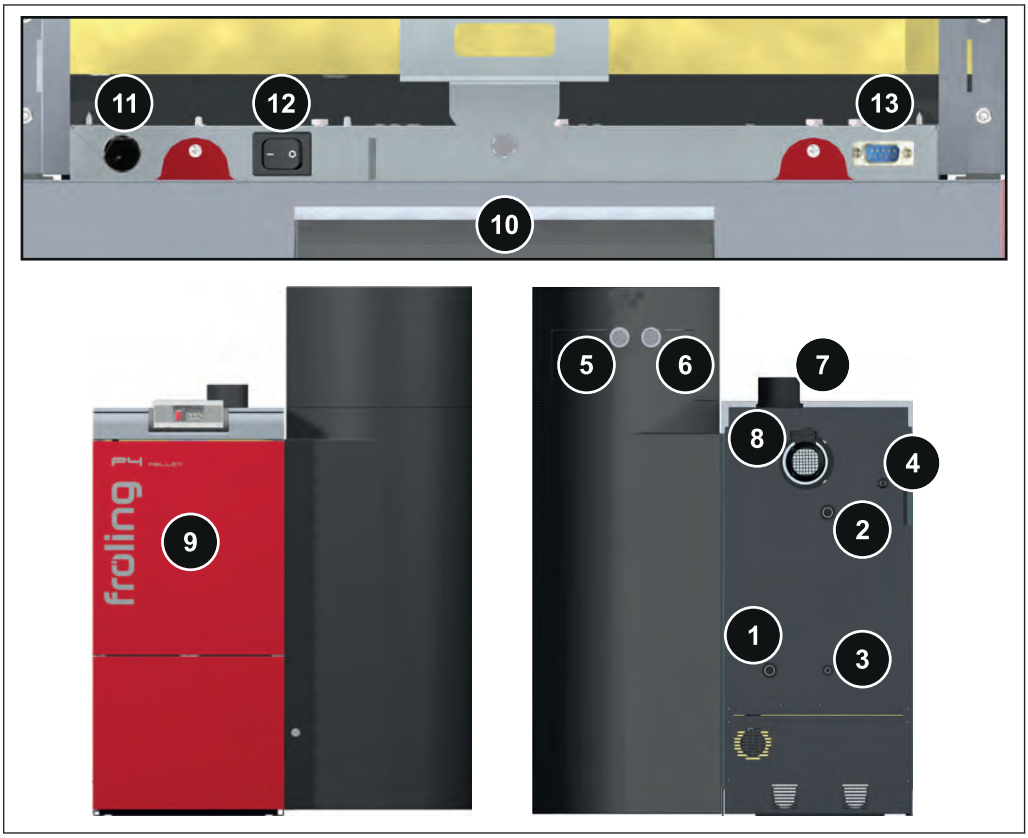
11.4 Flue gas pipe position



Description	Unit	8/15	20/25	32/30	48/60	80/100
A – Lateral distance	mm	420	585	650	815	1000
B – Depth distance	mm	90	90	85	90	80

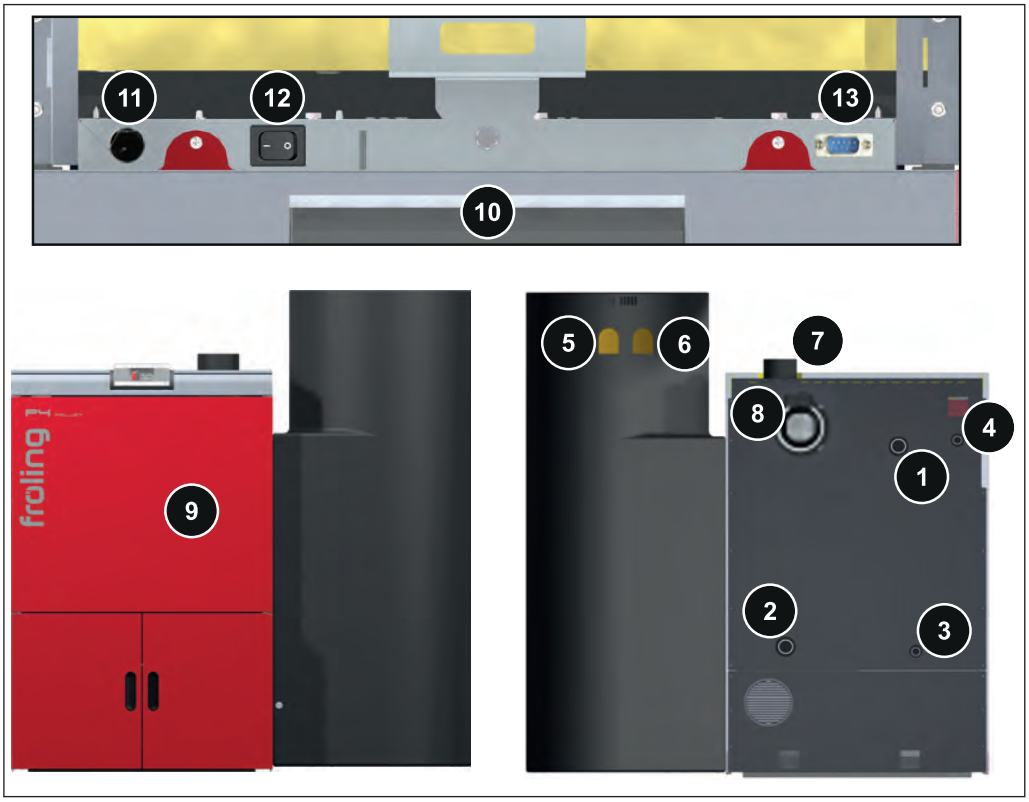
11.5 Components and connections

11.5.1 P4 Pellet 8-38



Item	Description	Unit	8 - 15	20 - 25	32 - 38
1	Boiler flow connection	inches	1	6/4	6/4
2	Boiler return connection	inches	1	6/4	6/4
3	Drainage connection	inches	1/2	1/2	1/2
4	Air vent connection	inches	1/2	1/2	1/2
5	Pellet suction line	mm	DA 60	DA 60	DA 60
6	Pellet return air line	mm	DA 60	DA 60	DA 60
7	Flue gas pipe connection (DM)	mm	130	130	150
8	Induced draught fan				
9	Controller box				
10	Lambdatronic P 3200 control				
11	High-limit thermostat (STL)				
12	Main switch				
13	Service interface				

11.5.2 P4 Pellet 48-100



Item	Description	Unit	48 - 60	80 - 100
1	Boiler flow connection	inches	6/4	2
2	Boiler return connection	inches	6/4	2
3	Drainage connection	inches	1/2	1
4	Air vent connection	inches	1	1
5	Pellet suction line	mm	DA 60	DA 60
6	Pellet return air line	mm	DA 60	DA 60
7	Flue gas pipe connection (DM)	mm	150	200
8	Induced draught fan			
9	Controller box			
10	Lambdatronic P 3200 control			
11	High-limit thermostat (STL)			
12	Main switch			
13	Service interface			

11.6 Technical specifications

11.6.1 P4 Pellet 8 - 25

Description		P4 Pellet			
		8	15	20	25
Heat exchanger design standard		EN 303-5			
Nominal heat output	kW	8	15	20	25
Heat output range		3,2-10,5	4,5-14,9	6,0-20,0	7,5-25,0
Electrical connection		230V / 50Hz / C16A			
Power consumption NL / PL	W	48 / 34	55 / 34	71 / 49	87 / 63
Boiler weight	kg	350	350	430	430
Boiler capacity (water)	l	70	70	80	80
Content ashcans heat exchanger / combustion chamber	l	13 / 13	13 / 13	25 / 15	25 / 15
Water pressure drop (ΔT = 20 K / 10K)	mbar	4,3 / 17,2	6,1 / 24,4	4,5 / 17,9	2,8 / 11,5
Min. boiler return temperature	°C	Not applicable due to internal return temperature control			
Max. permitted operating temperature	°C	80			
Min. operating temperature setting	°C	40			
Permitted operating pressure	psi bar	30 2			
Boiler class as per EN 303-5:2012		5			
Airborne sound level	dB(A)	< 70			
Permitted fuel as per EN 14961 [1)]		Part 2: Wood pellets class A1 / D06			

11.6.2 P4 Pellet 32 - 60

Description		P4 Pellet			
		32	38	48	60
Heat exchanger design standard		EN 303-5			
Nominal heat output	kW	32,0	38,0	48,0	58,5
Heat output range		9,6-32,0	11,4-38,0	14,4-48,0	17,6-58,5
Electrical connection		230V / 50Hz / C16A			
Power consumption NL / PL	W	104 / 78	110 / 78	114 / 45	119 / 80
Boiler weight	kg	530	530	760	760
Boiler capacity (water)	l	125	125	170	170
Content ash containers heat exchanger / combustion chamber	l	33 / 19	33 / 19	33 / 33	33 / 33
Water pressure drop (ΔT = 20 K / 10K)	mbar	1,5 / 6,2	2,1 / 8,7	3,7 / 10,5	5,3 / 12,3
Min. boiler return temperature	°C	Not applicable due to internal return temperature control			
Max. permitted operating temperature		80		88	
Min. operating temperature setting		40			
Permitted operating pressure	psi bar	30 2			
Boiler class as per EN 303-5:2012		5			
Airborne sound level	dB(A)	< 70			
Permitted fuel as per EN 14961 [1)]		Part 2: Wood pellets class A1 / D06			

11.6.3 P4 Pellet 80 - 100

Description		P4 Pellet			
		80	100	80	100
Heat exchanger design standard		EN 303-5		ASME	
Nominal heat output	kW	80,0	100,0	80,0	100,0
Heat output range		24-80	30-100	24-80	30-100
Electrical connection		230V / 50Hz / C16A			
Power consumption NL / PL	W	115 / 49	112 / 49	115 / 49	112 / 49
Boiler weight	kg	1090	1100	1090	1100
Boiler capacity (water)	l	280	280	280	280
Content ash containers heat exchanger / combustion chamber	l	33 / 33	33 / 33	33 / 33	33 / 33
Water pressure drop (ΔT = 20 K / 10K)	mbar	4,8 / 14,3	4,3 / 14,3	4,8 / 14,3	4,3 / 14,3
Min. boiler return temperature	°C	60			
Max. permitted operating temperature		88			
Min. operating temperature setting		40			
Permitted operating pressure	psi bar	45 3		43.5 3	
Boiler class as per EN 303-5:2012		5			
Airborne sound level	dB(A)	< 70			
Permitted fuel as per EN 14961 [1)]		Part 2: Wood pellets class A1 / D06			

11.6.4 Airborne sound level

The sound levels specified in the following table are based on a sound measurement on a P4 Pellet 15. (measuring device: Omega HHSL 1)

The sound level of the individual units was plotted at a distance of 1 m from the sound source.

Ambient level for measurement: 32 dBA

Unit	Measurement
Units in continuous operation:	
Induced draught fan (activation: 50%)	41 dBA
Induced draught fan (activation: 65%)	44 dBA
Induced draught fan (activation: 90%)	50 dBA
Units in non-continuous operation:	
Suction turbine	68 dBA
Grate motor	42 dBA
Stoker motor / Stoker screw	33 dBA
Ignition fan	53 dBA
WOS motor / WOS system	60 dBA
Burn back slide valve actuator (open)	34 dBA
Burn back slide valve actuator (close)	50 dBA

Please note that all the measurements were taken in-house and do not come from a certified test centre. This data should, therefore, be viewed as individual guideline measurements.

Please also note the sound levels required in the standards listed below, which must be fulfilled by planning and construction measures:

ÖNORM B 8115-2	Sound insulation and room acoustics in building construction - Requirements for sound insulation
ÖNORM H 5190	Heating systems - Acoustic insulation

12 Appendix

12.1 Adresses

12.1.1 Address of manufacturer

FROLING
Heizkessel- und Behälterbau GesmbH

Industriestraße 12
A-4710 Grieskirchen
AUSTRIA

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

12.1.2 Address of importer

STAMP

12.1.3 Address of Local Dealer

STAMP

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