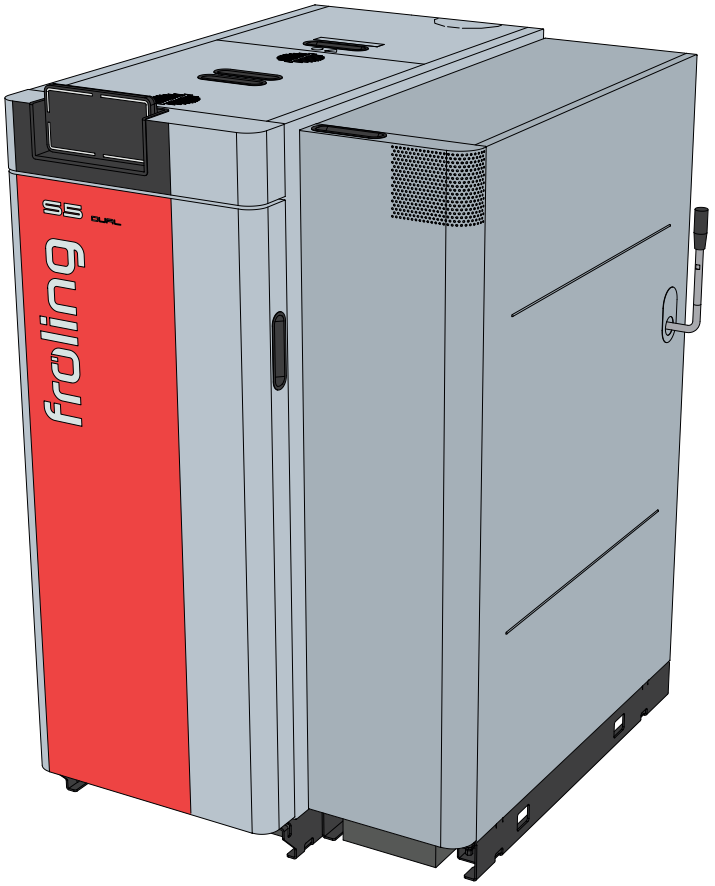
fröling

Installation instructions

Dual fuel boiler S5 Dual 22-48 (ESP)



Translation of original German version of installation instructions for technicians!

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

CE

M2940125_en | Edition 17/02/2026

1 General

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

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

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

Subject to technical change.

Issuing a delivery certificate

The EC Declaration of Conformity is only valid in conjunction with a delivery certificate, which has been filled in correctly and signed as part of the commissioning process. The original document remains at the installation site. Commissioning installers or heating engineers are requested to return a copy of the delivery certificate together with the guarantee card to Froling. On commissioning by FROLING Customer Service the validity of the delivery certificate will be noted on the customer service record.

1.1 About this manual

These installation instructions contain information for the following sizes of S5 Dual (ESP) boilers:

22, 30, 32, 34, 40, 48;

1.2 Disposal of packaging materials

All packaging materials should be disposed of in accordance with the relevant regulations. In addition, check the regulations for correct disposal applicable in your local area.

Data under the identification system of Directive 97/129/EC:

Identification code / Material		Disposal information
	Corrugated cardboard	Paper collection
	Wood	Check the regulations for correct disposal applicable in your local area
	Low Density Polyethylene (LDPE)	Plastics collection
	Expanded polystyrene	Plastics collection

2 Safety

2.1 Hazard levels of warnings

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

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

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

IMPORTANT

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

2.2 Qualification of assembly staff

⚠ CAUTION

If assembly and installation are performed by unqualified persons:

Risk of personal injury and damage to property!

During assembly and installation:

❒ Observe the instructions and information in the manuals

❒ Allow only appropriately qualified personnel to work on the system

Assembly, installation, initial startup and servicing must only be carried out by qualified personnel:

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

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

2.3 Personal protective equipment for assembly staff

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

- During transport, erection and installation:
  - wear suitable work wear
  - wear protective gloves
  - wear safety shoes (min. protection class S1P)

2.4 Residual risks for installation personnel

⚠ DANGER

Installation and commissioning of systems with electrostatic particle separators by personnel with pacemakers:

Electromagnetic fields may interfere with operation of the pacemaker when the system is switched on!

The following instruction applies to personnel with pacemakers:

❒ Perform installation and commissioning work only after appropriate medical assessment

3 Design Information

3.1 Overview of standards

Perform installation and commissioning of the system in accordance with the local fire and building regulations. Unless contrary to other national regulations, the latest versions of the following standards and guidelines apply:

3.1.1 General standards for heating systems

EN 303-5	Boilers for solid fuels, manually and automatically fed combustion systems, nominal heat output up to 500 kW
EN 12828	Heating systems in buildings - design of water-based heating systems
EN 13384-1	Chimneys - Thermal and fluid dynamic calculation methods Part 1: Chimneys serving one appliance
ÖNORM H 5151	Planning of central hot water heating systems with or without hot water preparation
ÖNORM M 7510-1	Guidelines for checking central heating systems Part 1: General requirements and one-off inspections
ÖNORM M 7510-4	Guidelines for checking central heating systems Part 4: Simple check for heating plants for solid fuels

3.1.2 Standards for structural and safety devices

ÖNORM H 5170	Heating installation - Requirements for construction and safety engineering, as well as fire prevention and environmental protection
ÖNORM EN ISO 20023	Solid biofuels - Safety of solid biofuel pellets - Safe handling and storage of wood pellets in residential and other small-scale applications
TRVB H 118	Technical directives for fire protection/prevention (Austria)

3.1.3 Standards for heating water

ÖNORM H 5195-1	Prevention of damage by corrosion and scale formation in closed warm water heating systems at operating temperatures up to 100°C (Austria).
VDI 2035	Prevention of damage hot water heating systems (Germany)
SWKI BT 102-01	Water quality for heating, steam, cooling and air conditioning systems (Switzerland)
UNI 8065	Technical standard regulating hot water preparation. DM 26.06.2015 (Ministerial Decree specifying the minimum requirements) Follow the instructions of this standard and any related updates. (Italy)

3.1.4 Regulations and standards for permitted fuels

1. BImSchV	First Order of the German Federal Government for the implementation of the Federal Law on Emission Protection (Ordinance on Small and Medium Combustion Plants) in the version published on 26 January 2010, BGBl. JG 2010 Part I No. 4.
EN ISO 17225-2	Solid bio-fuel - Fuel specifications and classes Part 2: Wood pellets for use in industrial and domestic systems
EN ISO 17225-3	Solid bio-fuel - Fuel specifications and classes Part 3: Wood briquettes for non-industrial use
EN ISO 17225-5	Solid bio-fuel - Fuel specifications and classes Part 5: Firewood for non-industrial use

3.2 Installation and approval

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

Note on standards

EN 12828 - Heating Systems in Buildings

IMPORTANT: Every heating system must be officially approved.

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

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

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

3.3 Installation site

Requirements for the load bearing substrate:

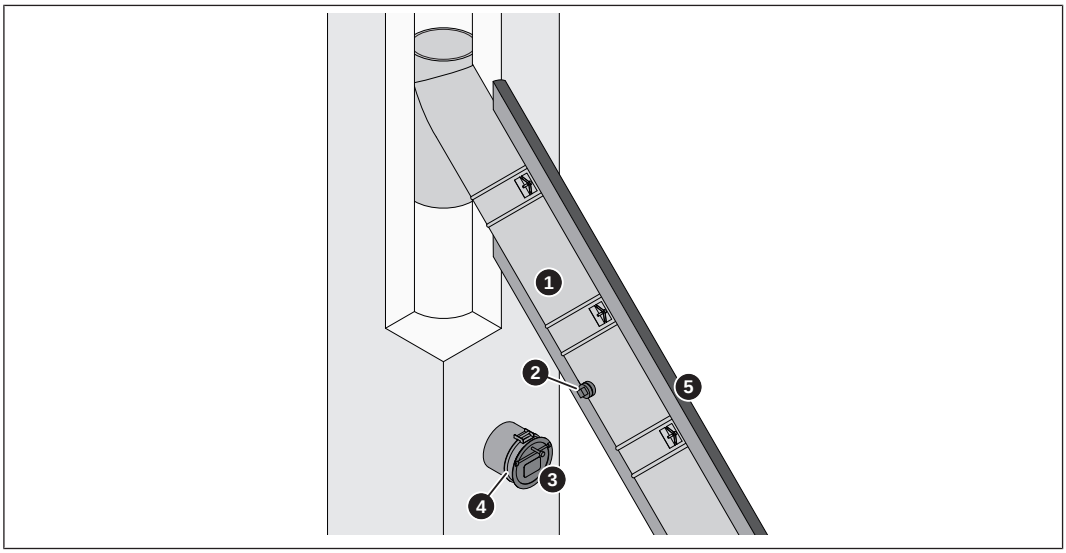
- Flat, clean and dry
- Non-combustible and with sufficient load-bearing capacity

Conditions at the installation site:

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

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

3.4 Chimney connection/chimney system



1	Connection line to the chimney
2	Measuring port
3	Draught limiter
4	Explosion flap (for automatic boilers)
5	Thermal insulation

IMPORTANT! The chimney must be authorised by a smoke trap sweeper or chimney sweep.

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

The flue gas temperatures (for clean systems) and additional flue gas values can be found in the table in the technical data.

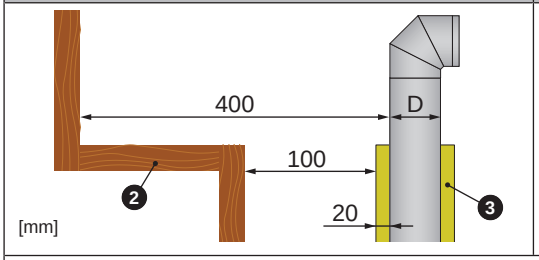
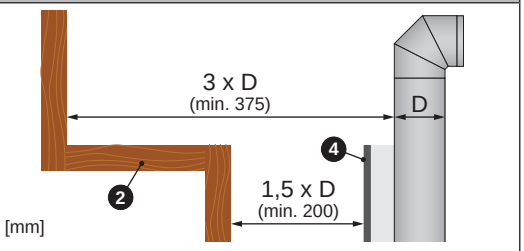
Local regulations and other statutory regulations are also applicable.

EN 303-5 specifies that the entire flue gas system must be designed to prevent, wherever possible, damage caused by seepage, insufficient feed pressure and condensation. Please note within the permissible operating range of the boiler flue gas temperatures lower than 160K above room temperature may occur.

3.4.1 Connection line to the chimney

Requirements for the connection line:

- this should be as short as possible and follow an upward incline to the chimney (30 - 45° recommended)
- thermally insulated

MFeuV[1] (Germany)	EN 15287-1 and EN 15287-2
	

1. Observe the fire regulations of the respective federal state
2. Component made of flammable material
3. Nonflammable insulating material
4. Radiation shield with rear ventilation

Minimum distance from flammable substances as per MFeuV[1] (Germany):

- 400 mm excluding thermal insulation
- 100 mm if at least 20 mm thermal insulation is installed

Minimum distance from flammable materials as per EN 15287-1 and EN 15287-2:

- 3 x nominal diameter of connection line, but at least 375 mm (NM)
- 1.5 x nominal diameter of connection line for radiation shield with rear ventilation, but at least 200 mm (NM)

IMPORTANT! The minimum distances must be observed in accordance with the standards and guidelines applicable in the region

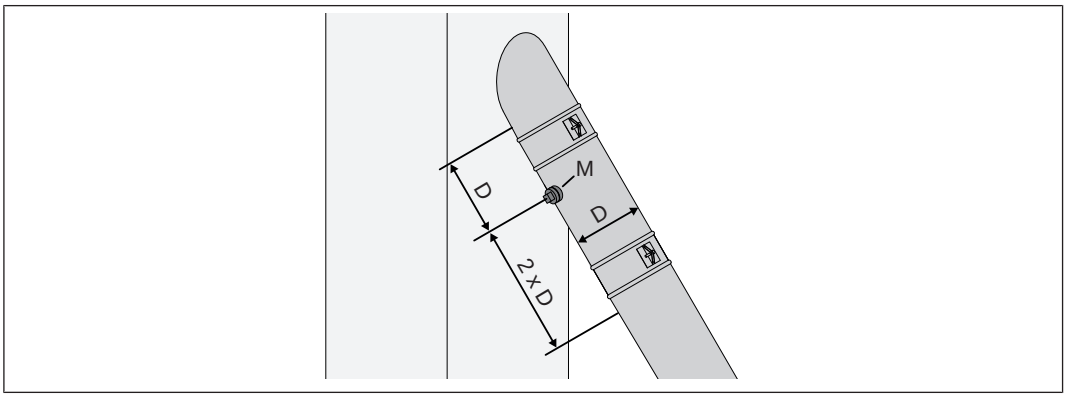
3.4.2 Draught limiter

We generally recommend installation of a draught limiter. If the values for the maximum permissible feed pressure stated in the section “Data for designing the flue gas system” are exceeded, a draught limiter must be installed.

Install the draught limiter directly under the discharge of the flue duct into the chimney, as at this point there is constant under-pressure which largely prevents the escape of dust from the draught limiter. If installation within the chimney is not practical, the draught limiter must be installed in the connection line to the chimney.

3.4.3 Measuring port

For emissions measurement on the system, a suitable measuring port must be installed in the connection line between the boiler and chimney system.



Upstream of the measuring port (M) there should be a straight run-in section with a length about twice the diameter (D) of the connection line. Downstream of the measuring port (M) there should be a straight run-out section with a length about the diameter (D) of the connection line. The measuring port must remain closed whenever the system is in operation.

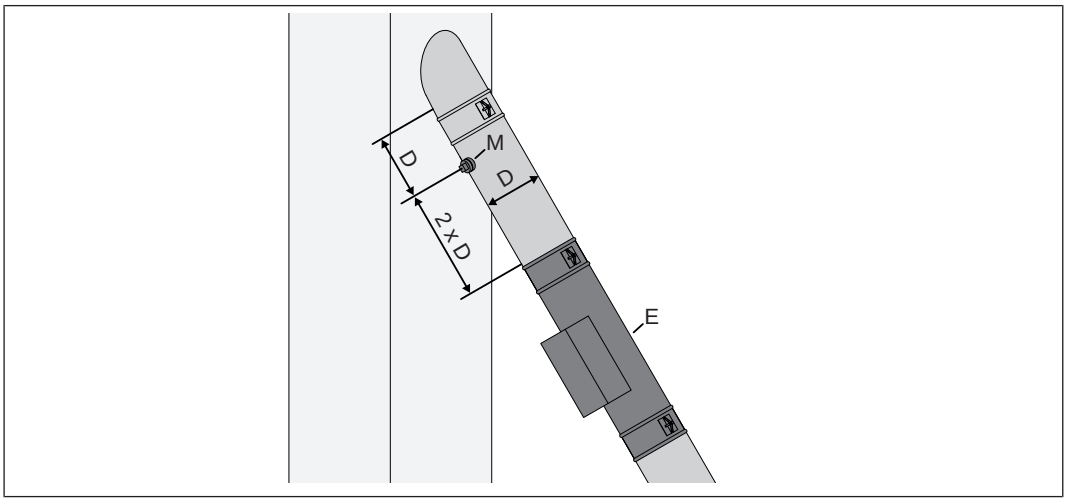
The diameter of the measuring probe used by Froling customer service is 14 mm. To avoid measuring errors due to the ingress of false air, the diameter of the measuring port must not exceed 21 mm.

3.4.4 Explosion flap

A deflagration damper must be installed in the immediate vicinity of the boiler. It should be situated so that when in operation it poses no risk to persons.

3.4.5 Electrostatic particle separator

For reduction in the emissions an electrostatic particle separator may optionally be installed in the flue gas line.



For planning and installation, comply with the following points:

- Position the measuring port (M) downstream of the electrostatic particle separator (E) as specified in the instructions
  ➲ "Measuring port" [▸ 13]
- Locate the electrostatic particle separator in accordance with the planning for the flue gas system
- Install the electrostatic particle separator in accordance with the manufacturer's instructions supplied

3.5 Combustion air

3.5.1 General requirement

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

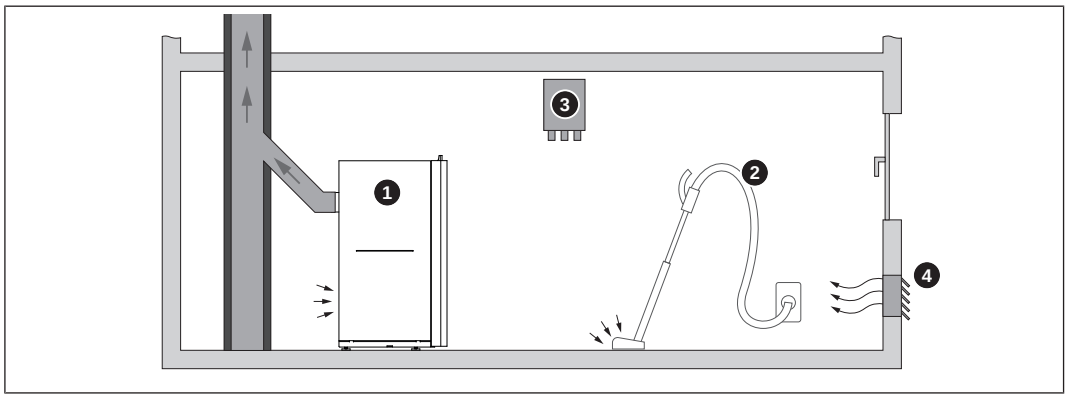
The boiler is operated depending on the room air, whereby the combustion air is taken from the installation site.

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

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

3.5.2 Room air-independent operation

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



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

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

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

Examples

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

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

Note on standards

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

3.6 Domestic hot water

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

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

Observe the standards and also follow the recommendations below:

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

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

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

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

Additional requirements for Switzerland

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

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

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

Inspection:

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

Advantages of heating water treated in accordance with the standards:

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

Frost protection

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

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

3.7 Pressure maintenance systems

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

Compressor-controlled pressure maintenance

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

Pump-controlled pressure maintenance

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

3.8 Return lift

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

IMPORTANT

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

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

Take the following precautions:

❒ Regulations stipulate the use of a return temperature control.

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

3.9 Storage tank

Observe the regional regulations for using a storage tank!

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

Channelling the heat generated by the Dual fuel boiler to a storage tank can bring major advantages, such as

- better utilisation of fuel
- more user-friendly operation in terms of reloading intervals
- maximum independence from instantaneous heating requirements
- minimal dirt in boiler and flue gas system

As the minimum continuous heat output of the boiler is 30% greater than the rated heat output, we as the boiler manufacturer are obliged under EN 303-5:2021, Section 4.4.6 to advise that the Dual fuel boiler S5 Dual must always be connected to a storage tank with adequate storage capacity.

The storage tank capacity can be calculated according to EN 303-5:2021 using the following formula:

$$V_{Sp} = 15 T_B \times P_N (1 - 0.3 \times P_H / P_{min})$$

V_{Sp}	Storage tank volume in litres
P_N	Rated output of the boiler in kW
T_B	Combustion period of the boiler in [1]
P_H	Heating load of the building in kW
P_{min}	Minimum output of the boiler in kW[2]

1. Sample combustion times for various fuels are provided in the technical data
2. The boiler's minimum output is the lowest value of the output range in the technical data. If there is no minimum heat output specified, use the nominal heat output ($P_{min} = P_N$)

For the correct dimensions of the storage tank and the line insulation (for instance to ÖNORM M 7510 or guideline UZ37) please consult your installer or Froling.

Recommended storage tank capacity:

	Unit	S5 Dual (ESP)		
		22 - 30	32 - 40	48
Recommended storage tank capacity[1]	[l]	2000	2500	3000

1. Values for calculating the capacity can be found in the technical data or the technical data with partial load inspection (if available)

Certain countries have recommended storage capacities; these are listed below. The specified values apply when the nominal heat output of the boiler corresponds to the heating requirements of the building and a maximum of 50% of the nominal heat output can be dissipated to the building being heated under partial load conditions.

The exact design of the storage tank capacity is in accordance with the locally applicable guidelines and regulations:

Germany The first BImSchV (Ordinance on small and medium-sized heating plants of 26 January 2010, BGBl. I P. 38) stipulates a minimum water heat storage tank volume of 55 litres per kilowatt of rated heat output; a water heat storage tank with a volume of 12 litres per litre of fuel loading chamber is recommended.

Switzerland In accordance with the Swiss Federal Ordinance on Air Pollution Control (LRV 2018), Appendix 3, Paragraph 523 “Special requirements for boilers”, hand-fed boilers up to 500 kW rated heat output must be fitted with a minimum heat storage tank volume of 12 litres per litre of fuel loading chamber. The volume must not be less than 55 litres per kW rated heat output.

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

The boiler should be operated with a hot water tank. The storage capacity = 45 x P_r x (1-2.7/P_r) or 300 litres, whichever is greater, where the rated heat output of P_r is given in kW. The resulting storage capacity is less than the above-mentioned recommended storage tank capacity.

3.10 Boiler ventilation

❒ Fit the automatic ventilating valve at the highest point on the boiler or at the ventilation connection (if present).

↳ This ensures that air in the boiler is constantly expelled, thus preventing malfunctions caused by air in the boiler

❒ Check that the boiler ventilation is working properly

↳ After installation and periodically according to manufacturer’s instructions

Tip: ❒ Fit a vertical pipe as a calming section in front of the automatic ventilating valve in such a way that the ventilating valve is positioned above the water level in the boiler

Recommendation: ❒ Fit a microbubble separator in the pipes to the boiler

↳ Follow the manufacturer's instructions!

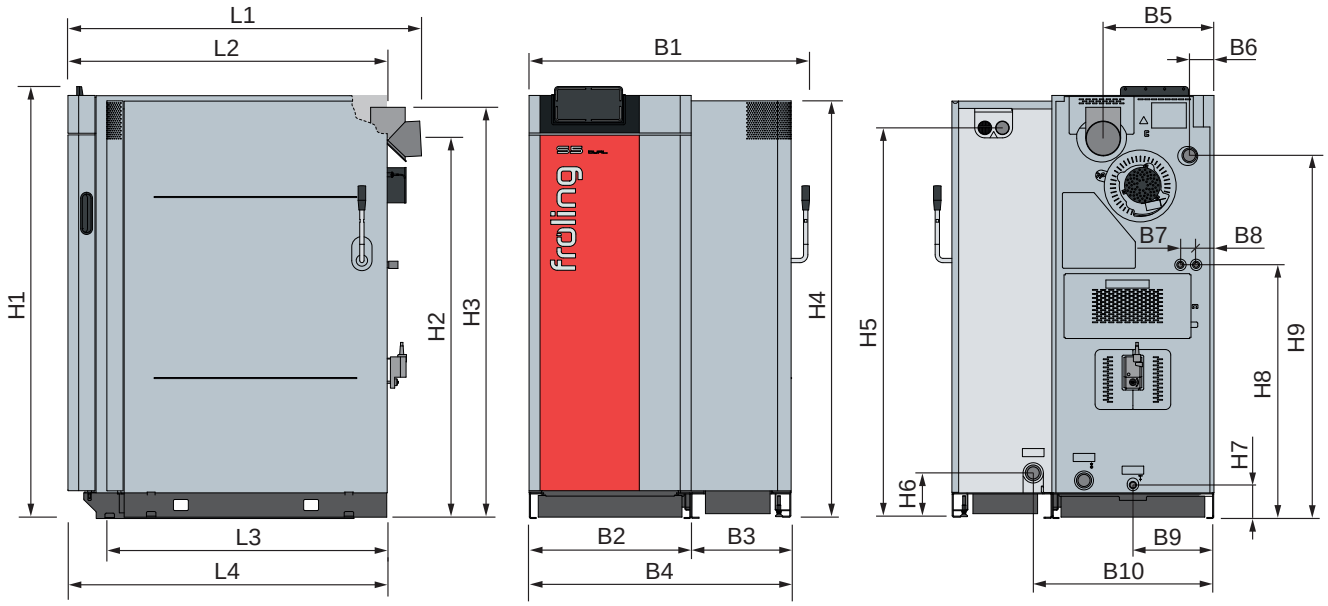
3.11 Installation material

When connecting the system hydraulically, ensure that the materials used (piping, seals, etc.) can withstand the maximum temperatures both during operation and in the event of a malfunction (max. 110 °C in accordance with EN 303-5).

When connecting to pipe systems with lower temperature resistance (e.g. plastic pipes for underfloor heating or district heating pipes), suitable components (e.g. contact thermostat) must be used on site to protect the materials.

4 Technology

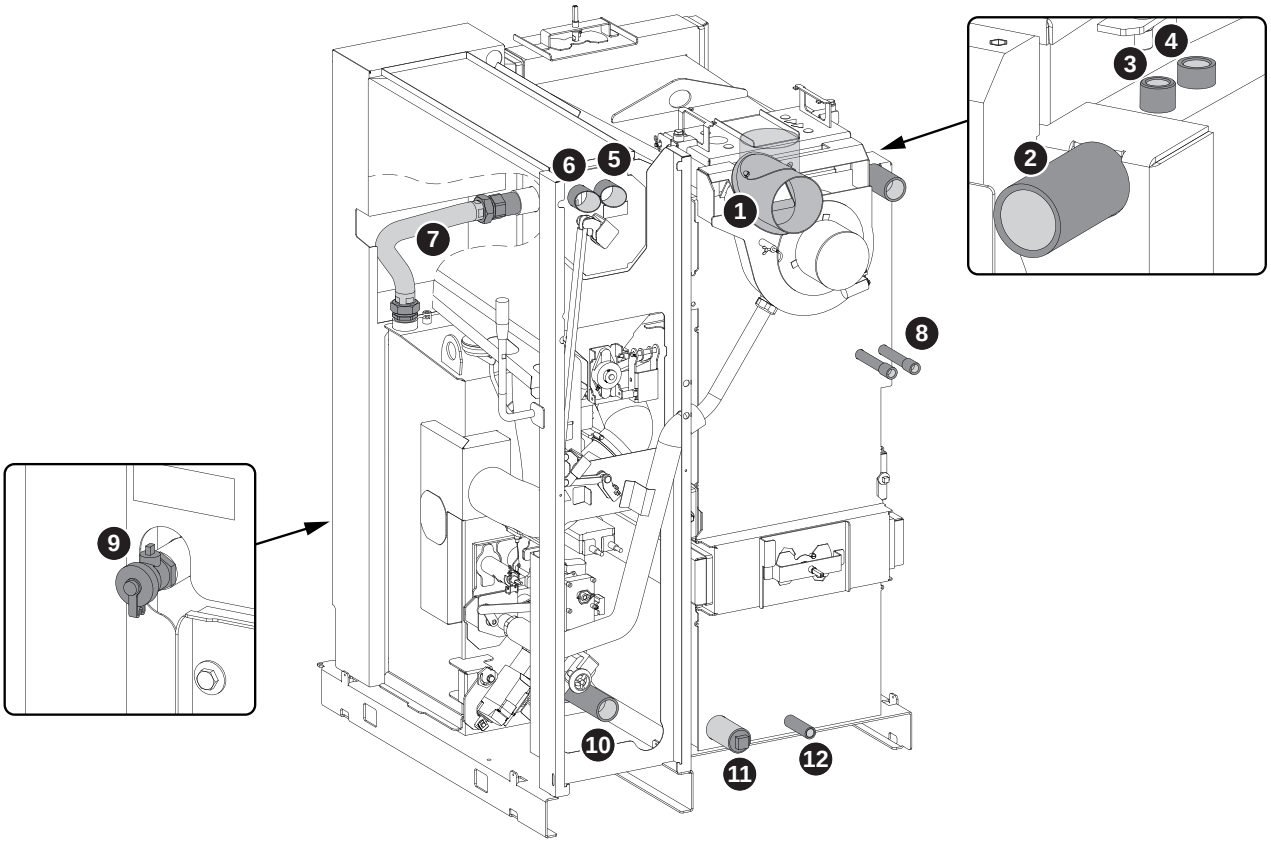
4.1 Dimensions S5 Dual



Size	Designation		22-30	32-48
L1	Length of firewood boiler (flue gas pipe rear connection)	mm	1305	1335
L2	Distance from the flue gas pipe top connection to the front face of the boiler		1185	1215
L3	Length, pellet unit		1040	1040
L4	Length, firewood boiler		1180	1210
B1	Total width including WOS lever		1040	1140
B2	Width, firewood boiler		600	700
B3	Width, pellet unit		370	370
B4	Width, boiler		970	1070
B5	Distance between flue gas pipe connection and the side of the boiler		410	510
B6	Distance between the flow connection and the side of the boiler		90	145
W7	Distance between safety heat exchanger connections		60	75
B8	Distance between the safety heat exchanger connection and the side of the boiler		65	125
B9	Distance between drainage connection and side of boiler		300	350
B10	Clearance from return connection to side of boiler		670	770
H1	Height of boiler		1600	1650
H2	Height, connection for rear flue gas pipe		1405	1455
H3	Height, top connection for the flue gas pipe		1520	1570
H4	Height, pellet unit		1545	1545
H5	Height, hose line connections		1445	1445
H6	Height, return connection		170	170
H7	Height, drainage connection		125	125
H8	Height of safety heat exchanger connection		940	990

Size	Designation		22-30	32-48
H9	Height of flow connection		1345	1395

4.2 Components and connections



Item	Designation	22-30	32-48
1	Flue gas pipe connection (external diameter)	129 mm	149 mm
2	Boiler flow connection	6/4” IT	
3	Position for boiler sensor and STL capillary (internal diameter)	16 mm	
4	Immersion sleeve sensor connection for thermal discharge valve (supplied by the customer)	1/2“ IT	
5	Pellets suction hose connection (PELLETS sticker)	50 mm	
6	Return-air line connection	50 mm	
7	Pipe union [1)] - Pellet unit outfeed to firewood boiler	6/4” IT	
8	Safety heat exchanger connection	1/2“ IT	
9	Pellet unit drainage	1/2“ IT	
10	Boiler return connection	6/4” IT	
11	Rear boiler return connection S5 Turbo (sealed tightly with blanking plug[1)] for S5 Dual)	-	
12	Firewood boiler drainage connection	1/2“ IT	

1. Included in delivery

4.3 Technical specifications

4.3.1 S5 Dual 22-30

Technical data of the dual fuel boiler in firewood operation

Refer to the technical data of the firewood boiler for technical specifications and information regarding efficiency and emissions in firewood operation.

Technical data of the dual fuel boiler for pellet operation

Designation		S5 Dual	
		22	30
Rated heat output	kW	22.0	30.0
Output range		6.6 – 22.0	9.0 – 30.0
Boiler efficiency (NCV) at nominal/partial load (wood pellets)	%	95.0 / 92.2	95.2 / 92.2
Electrical connection		230 V / 50 Hz / C16A	
Weight of the firewood boiler	kg	570	
Weight of pellet unit	kg	190	
Total boiler capacity (water)	l	134	
Pellet container capacity	l	80	
Ash container capacity	l	18	
Water pressure drop (ΔT = 10 / 20 K)	mbar	16 / 1	21 / 4
Flow rate at nominal load (ΔT = 20 K)	m³/h	0.95	1.29
Minimum flow rate	m³/h	0.38	0.52
Minimum boiler return temperature	°C	60	
Maximum permitted operating temperature	°C	90	
Permitted operating pressure	bar	4	
Airborne sound level	dB(A)	< 70	
Boiler class to EN 303-5:2021		5	
Boiler category		1	
Permitted fuel as per EN ISO 17225[1)]		Part 2: Wood pellets class A1 / D06	
Test book number		PB 315	PB 316

1. Detailed information on the fuel can be found in the operating instructions in the section entitled “Permitted fuels”

Product data in accordance with the regulations (EU) 2015/1187 and 2015/1189

Designation		S5 Dual	
		22	30
Heating up mode		automatic	
Condensing boiler		No	
Solid fuel boiler for combined heat and power		No	
Combined heating system		No	
Storage tank volume		➲ "Storage tank" [▶ 20]	
Preferred fuel		Compressed wood in the form of pellets	
Useful heat delivered at rated heat output (P_n)	kW	22	30
Useful heat delivered at 30% of rated heat output (P_p)		6.6	9.0
Fuel efficiency at rated heat output (η_n)	%	87.9	88.0
Fuel efficiency at 30% of rated heat output (η_p)		85.3	85.3
Auxiliary current consumption at rated heat output (el_{max})	kW	0.065	0.075
Auxiliary current consumption at 30% of rated heat output (el_{min})		0.050	0.050
Auxiliary current consumption in standby mode (P_{SB})		0.015	0.015
Energy efficiency class of the boiler		A+	A+
Energy efficiency index (EEI) of the boiler		119	120
Temperature controller used		Lambdatronic 5000	
Class of the temperature controller		II	II
Contribution of the temperature controller to the energy efficiency index of a combined system	%	2	2
Energy efficiency index (EEI) of the combined boiler and controller[1)]		121	122
Energy efficiency class of the combined boiler and controller[1)]		A+	A+
Heating space annual rate of use ηs	%	81	81
Annual space heating emissions of dust (PM)[2)]	mg/m³	30	30
Annual space heating emissions of gaseous organic compounds (GOC)[2)]	mg/m³	20	20
Annual space heating emissions of carbon monoxide (CO)[2)]	mg/m³	380	380
Annual space heating emissions of nitrogen oxides (NOx)[2)]	mg/m³	200	200
Other permitted fuels		Firewood, moisture content ≤ 25 %	
The applicable product data can be found in the technical data for the firewood boiler.			

1. The information on the energy efficiency index EEI of the combined boiler and controller and the energy efficiency class of the combined boiler and controller applies only if the Froling control components supplied as standard with the respective boiler are used.
2. Specified emission values refer to dry flue gas with an oxygen content of 10 % and under standard conditions at 0°C and 1013 millibars.

4.3.2 S5 Dual 22-30 ESP

Technical data of the dual fuel boiler in firewood operation

Refer to the technical data of the firewood boiler for technical specifications and information regarding efficiency and emissions in firewood operation.

Technical data of the dual fuel boiler for pellet operation

Designation		S5 Dual ESP	
		22	30
Rated heat output	kW	22.0	30.0
Output range		6.6 – 22.0	9.0 – 30.0
Boiler efficiency (NCV) at nominal/partial load (wood pellets)	%	95.0 / 93.0	95.3 / 93.0
Electrical connection		230 V / 50 Hz / C16A	
Weight of the firewood boiler	kg	570	
Weight of pellet unit	kg	190	
Total boiler capacity (water)	l	134	
Pellet container capacity	l	80	
Ash container capacity	l	18	
Water pressure drop (ΔT = 10 / 20 K)	mbar	16 / 1	21 / 4
Flow rate at nominal load (ΔT = 20 K)	m³/h	0.95	1.29
Minimum flow rate	m³/h	0.38	0.52
Minimum boiler return temperature	°C	60	
Maximum permitted operating temperature	°C	90	
Permitted operating pressure	bar	4	
Airborne sound level	dB(A)	< 70	
Boiler class to EN 303-5:2021		5	
Boiler category		1	
Permitted fuel as per EN ISO 17225[1)]		Part 2: Wood pellets class A1 / D06	
Test book number		PB 317	PB 318

1. Detailed information on the fuel can be found in the operating instructions in the section entitled “Permitted fuels”

Product data in accordance with the regulations (EU) 2015/1187 and 2015/1189

Designation		S5 Dual ESP	
		22	30
Heating up mode		automatic	
Condensing boiler		No	
Solid fuel boiler for combined heat and power		No	
Combined heating system		No	
Storage tank volume		➲ "Storage tank" [▶ 20]	
Preferred fuel		Compressed wood in the form of pellets	
Useful heat delivered at rated heat output (P_n)	kW	22	30
Useful heat delivered at 30% of rated heat output (P_p)		6.6	9.0
Fuel efficiency at rated heat output (η_n)	%	87.9	88.1
Fuel efficiency at 30% of rated heat output (η_p)		86.0	86.0
Auxiliary current consumption at rated heat output (el_{max})	kW	0.080	0.095
Auxiliary current consumption at 30% of rated heat output (el_{min})		0.060	0.060
Auxiliary current consumption in standby mode (P_{SB})		0.015	0.015
Energy efficiency class of the boiler		A+	A+
Energy efficiency index (EEI) of the boiler		120	120
Temperature controller used		Lambdatronic 5000	
Class of the temperature controller		II	II
Contribution of the temperature controller to the energy efficiency index of a combined system	%	2	2
Energy efficiency index (EEI) of the combined boiler and controller[1)]		122	122
Energy efficiency class of the combined boiler and controller[1)]		A+	A+
Heating space annual rate of use ηs	%	81	81
Annual space heating emissions of dust (PM)[2)]	mg/m³	30	30
Annual space heating emissions of gaseous organic compounds (GOC)[2)]	mg/m³	20	20
Annual space heating emissions of carbon monoxide (CO)[2)]	mg/m³	380	380
Annual space heating emissions of nitrogen oxides (NOx)[2)]	mg/m³	200	200
Other permitted fuels		Firewood, moisture content ≤ 25 %	
The applicable product data can be found in the technical data for the firewood boiler.			

1. The information on the energy efficiency index EEI of the combined boiler and controller and the energy efficiency class of the combined boiler and controller applies only if the Froling control components supplied as standard with the respective boiler are used.
2. Specified emission values refer to dry flue gas with an oxygen content of 10 % and under standard conditions at 0°C and 1013 millibars.

4.3.3 S5 Dual 32-48

Technical data of the dual fuel boiler in firewood operation

Refer to the technical data of the firewood boiler for technical specifications and information regarding efficiency and emissions in firewood operation.

Technical data of the dual fuel boiler for pellet operation

Designation		S5 Dual			
		32	34	40	48
Rated heat output	kW	32.0	34.0	40.0	40.0
Output range		9.6 – 32.0	10.2 – 34.0	12.0 - 40.0	12.0 - 40.0
Boiler efficiency (NCV) at nominal/partial load (wood pellets)	%	94.8 / 93.3	94.8 / 93.3	94.7 / 93.3	94.7 / 93.3
Electrical connection		230 V / 50 Hz / C16A			
Weight of the firewood boiler	kg	680			
Weight of pellet unit	kg	190			
Total boiler capacity (water)	l	159			
Pellet container capacity	l	80			
Ash container capacity	l	18			
Water pressure drop (ΔT = 10 / 20 K)	mbar	24 / 5	27 / 6	37 / 9	37 / 9
Flow rate at nominal load (ΔT = 20 K)	m³/h	1.38	1.47	1.72	1.72
Minimum flow rate	m³/h	0.55	0.59	0.69	0.69
Minimum boiler return temperature	°C	60			
Maximum permitted operating temperature	°C	90			
Permitted operating pressure	bar	4			
Airborne sound level	dB(A)	< 70			
Boiler class to EN 303-5:2012		5			
Boiler category		1			
Permitted fuel as per EN ISO 17225[1)]		Part 2: Wood pellets class A1 / D06			
Test book number		PB 319	PB 320	PB 321	PB 322

1. Detailed information on the fuel can be found in the operating instructions in the section entitled “Permitted fuels”

Product data in accordance with the regulations (EU) 2015/1187 and 2015/1189

Designation		S5 Dual			
		32	34	40	48
Heating up mode		automatic			
Condensing boiler		No			
Solid fuel boiler for combined heat and power		No			
Combined heating system		No			
Storage tank volume		➲ "Storage tank" [▶ 20]			
Preferred fuel		Compressed wood in the form of pellets			
Useful heat delivered at rated heat output (P_n)	kW	32	34	40	40
Useful heat delivered at 30% of rated heat output (P_p)		9.6	10.2	12.0	12.0
Fuel efficiency at rated heat output (η_n)	%	87.7	87.7	87.6	87.6
Fuel efficiency at 30% of rated heat output (η_p)		86.3	86.3	86.3	86.3
Auxiliary current consumption at rated heat output (el_{max})	kW	0.075	0.076	0.080	0.080
Auxiliary current consumption at 30% of rated heat output (el_{min})		0.045	0.045	0.045	0.045
Auxiliary current consumption in standby mode (P_{SB})		0.015	0.015	0.015	0.015
Energy efficiency class of the boiler		A+	A+	A+	A+
Energy efficiency index (EEI) of the boiler		121	121	121	121
Temperature controller used		Lambdatronic 5000			
Class of the temperature controller		II	II	II	II
Contribution of the temperature controller to the energy efficiency index of a combined system	%	2	2	2	2
Energy efficiency index (EEI) of the combined boiler and controller[1)]		123	123	123	123
Energy efficiency class of the combined boiler and controller[1)]		A+	A+	A+	A+
Heating space annual rate of use ηs	%	82	82	82	82
Annual space heating emissions of dust (PM)[2)]	mg/m³	30	30	30	30
Annual space heating emissions of gaseous organic compounds (GOC)[2)]	mg/m³	20	20	20	20
Annual space heating emissions of carbon monoxide (CO)[2)]	mg/m³	380	380	380	380
Annual space heating emissions of nitrogen oxides (NOx)[2)]	mg/m³	200	200	200	200
Other permitted fuels		Firewood, moisture content ≤ 25 %			
The applicable product data can be found in the technical data for the firewood boiler.					

1. The information on the energy efficiency index EEI of the combined boiler and controller and the energy efficiency class of the combined boiler and controller applies only if the Froling control components supplied as standard with the respective boiler are used.
2. Specified emission values refer to dry flue gas with an oxygen content of 10 % and under standard conditions at 0°C and 1013 millibars.

4.3.4 S5 Dual 32-48 ESP

Technical data of the dual fuel boiler in firewood operation

Refer to the technical data of the firewood boiler for technical specifications and information regarding efficiency and emissions in firewood operation.

Technical data of the dual fuel boiler for pellet operation

Designation		S5 Dual ESP			
		32	34	40	48
Rated heat output	kW	32.0	34.0	40.0	40.0
Output range		9.6 – 32.0	10.2 – 34.0	12.0 - 40.0	12.0 - 40.0
Boiler efficiency (NCV) at nominal/partial load (wood pellets)	%	94.9 / 93.5	94.9 / 93.5	95.0 - 93.5	95.0 - 93.5
Electrical connection		230 V / 50 Hz / C16A			
Weight of the firewood boiler	kg	680			
Weight of pellet unit	kg	190			
Total boiler capacity (water)	l	159			
Pellet container capacity	l	80			
Ash container capacity	l	18			
Water pressure drop (ΔT = 10 / 20 K)	mbar	24 / 5	27 / 6	37 / 9	37 / 9
Flow rate at nominal load (ΔT = 20 K)	m³/h	1.38	1.47	1.72	1.72
Minimum flow rate	m³/h	0.55	0.59	0.69	0.69
Minimum boiler return temperature	°C	60			
Maximum permitted operating temperature	°C	90			
Permitted operating pressure	bar	4			
Airborne sound level	dB(A)	< 70			
Boiler class to EN 303-5:2012		5			
Boiler category		1			
Permitted fuel as per EN ISO 17225[1)]		Part 2: Wood pellets class A1 / D06			
Test book number		PB 323	PB 324	PB 325	PB 326

1. Detailed information on the fuel can be found in the operating instructions in the section entitled “Permitted fuels”

Product data in accordance with the regulations (EU) 2015/1187 and 2015/1189

Designation		S5 Dual ESP			
		32	34	40	48
Heating up mode		automatic			
Condensing boiler		No			
Solid fuel boiler for combined heat and power		No			
Combined heating system		No			
Storage tank volume		➲ "Storage tank" [▶ 20]			
Preferred fuel		Compressed wood in the form of pellets			
Useful heat delivered at rated heat output (P_n)	kW	32	34	40	40
Useful heat delivered at 30% of rated heat output (P_p)		9.6	10.2	12.0	12.0
Fuel efficiency at rated heat output (η_n)	%	87.8	87.8	87.9	87.9
Fuel efficiency at 30% of rated heat output (η_p)		86.4	86.4	86.4	86.4
Auxiliary current consumption at rated heat output (el_{max})	kW	0.090	0.093	0.100	0.100
Auxiliary current consumption at 30% of rated heat output (el_{min})		0.060	0.060	0.060	0.060
Auxiliary current consumption in standby mode (P_{SB})		0.015	0.015	0.015	0.015
Energy efficiency class of the boiler		A+	A+	A+	A+
Energy efficiency index (EEI) of the boiler		121	121	121	121
Temperature controller used		Lambdatronic 5000			
Class of the temperature controller		II	II	II	II
Contribution of the temperature controller to the energy efficiency index of a combined system	%	2	2	2	2
Energy efficiency index (EEI) of the combined boiler and controller[1)]		123	123	123	123
Energy efficiency class of the combined boiler and controller[1)]		A+	A+	A+	A+
Heating space annual rate of use ηs	%	82	82	82	82
Annual space heating emissions of dust (PM)[2)]	mg/m³	30	30	30	30
Annual space heating emissions of gaseous organic compounds (GOC)[2)]	mg/m³	20	20	20	20
Annual space heating emissions of carbon monoxide (CO)[2)]	mg/m³	380	380	380	380
Annual space heating emissions of nitrogen oxides (NOx)[2)]	mg/m³	200	200	200	200
Other permitted fuels		Firewood, moisture content ≤ 25 %			
The applicable product data can be found in the technical data for the firewood boiler.					

1. The information on the energy efficiency index EEI of the combined boiler and controller and the energy efficiency class of the combined boiler and controller applies only if the Froling control components supplied as standard with the respective boiler are used.
2. Specified emission values refer to dry flue gas with an oxygen content of 10 % and under standard conditions at 0°C and 1013 millibars.

4.3.5 Boiler data for planning the flue gas system

The flue gas performance values listed below should be used for calculation of the fluid dynamics for flue gas systems as specified in the EN 13384 series of standards. The flue gas performance values for the respective outputs are applicable under typical operating conditions when using fuels consistent with the fuel class specified in EN ISO 17225.

Designation		S5 Dual (ESP)	
		22	30
Flue gas temperature at rated heat output T_{WN} / at the lowest output T_{Wmin}	°C	140 / 90	160 / 90
Volumetric concentration of CO_2 in the dry flue gas $\sigma(CO_2)$ at rated heat output	%	12.3	12.3
Flue gas mass flow at rated heat output $\dot{m}_N$ / at the lowest output $\dot{m}_{min}$	kg/h	57.6 / 18.0	79.2 / 25.2
	kg/s	0.016 / 0.005	0.022 / 0.007
Feed pressure P_{WN} required at the rated heat output / P_{Wmin} required at the lowest output	Pa	5 / 2	
Maximum permissible feed pressure P_{Wmax}	Pa	30	
Maximum permissible feed pressure $P_{Wmax}$with an electronic separator (internal and external)	Pa	15	
Feed pressure P_{WO} (blower fan delivery pressure) available at the appliance	Pa	-	
Flue spigot diameter D	mm	129	
Data to be used when for operation independent of the room air			
Supply air connection diameter	mm	-	
Maximum permissible pressure drop P_{Bmax} in the supply air line	Pa	-	
Combustion air volume at rated heat output	m³/h	-	-

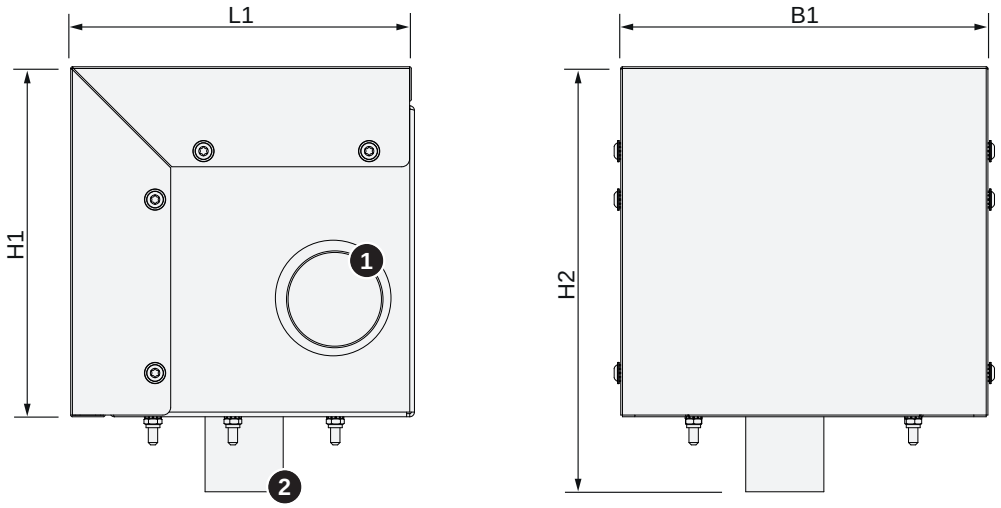
Designation		S5 Dual (ESP)			
		32	34	40	48
Flue gas temperature at rated heat output T_{WN} / at the lowest output T_{Wmin}	°C	140 / 90	140 / 90	160 / 90	180 / 90
Volumetric concentration of CO_2 in the dry flue gas $\sigma(CO_2)$ at rated heat output	%	12.3	12.3	12.3	12.3
Flue gas mass flow at rated heat output $\dot{m}_N$ / at the lowest output $\dot{m}_{min}$	kg/h	82.5 / 23.6	86.4 / 28.8	104.4 / 32.4	126.0 / 32.4
	kg/s	0.023 / 0.007	0.024 / 0.008	0.029 / 0.009	0.035 / 0.009
Feed pressure P_{WN} required at the rated heat output / P_{Wmin} required at the lowest output	Pa	5 / 2			
Maximum permissible feed pressure P_{Wmax}	Pa	30			
Maximum permissible feed pressure $P_{Wmax}$with an electronic separator (internal and external)	Pa	15			
Feed pressure P_{WO} (blower fan delivery pressure) available at the appliance	Pa	-			
Flue spigot diameter D	mm	149			
Data to be used when for operation independent of the room air					
Supply air connection diameter	mm	-			
Maximum permissible pressure drop P_{Bmax} in the supply air line	Pa	-			

Designation		S5 Dual (ESP)			
		32	34	40	48
Combustion air volume at rated heat output	m³/h	-	-	-	-

4.3.6 Data for planning a backup power supply

Description		Value
Continuous output (single phase)	VA	3680
Nominal voltage	VAC	230 ± 6%
Frequency	Hz	50 ± 2%

4.4 External suction module

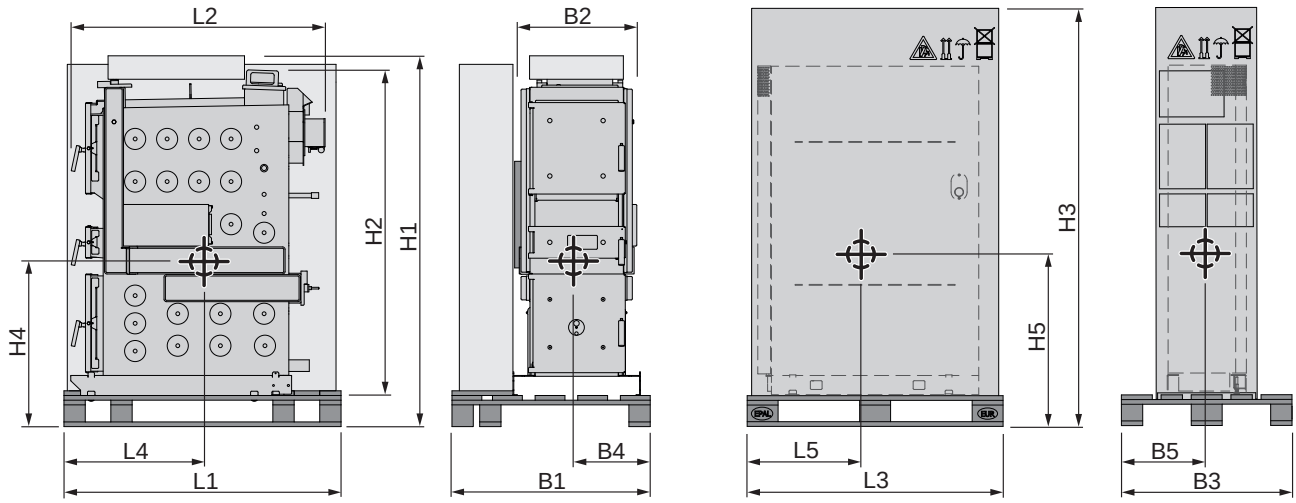


Dimension	Description	Unit	Size 1	Size 2
L1	Length of suction module	mm	220	265
B1	Width of suction module		235	290
H1	Height of suction module		225	235
H2	Total height incl. hose connection		275	285
1	Return air line connection (line to suction point)	mm	50	
2	Connection return air line (line from boiler)		50	

5 Transport and storage

5.1 Delivery configuration

The firewood boiler comes packed in protective casing on a pallet. The pellet unit is delivered on a pallet in cardboard packaging.



Item	Designation		S5 Dual (ESP)	
			22-30	32-48
L1	Length	mm	1300	1340
B1	Width		930	1080
H1	Height		1740	1740
-	Weight of the S5 Turbo boiler body incl. attachments and pallet	kg	660	790
L2	Length	mm	1195	1220
B2	Width		600	670
H2	Height		1530	1590
-	S5 Turbo boiler body weight	kg	540	680
L3	Length	mm	1200	
B3	Width		800	
H3	Height		1960	
-	Weight of pellet unit including packaging and pallet	kg	240	
Centre of gravity				
L4	Length	mm	600	
B4	Width		400	
H4	Height		780	
L5	Length		535	
B5	Width		395	
H5	Height		805	

5.2 Temporary storage

If the system is to be assembled at a later stage:

❒ Store components at a protected location, which is dry and free from dust

↳ Damp conditions and frost can damage components, particularly electric ones!

5.3 Positioning

IMPORTANT

Damage to components if handled incorrectly

❒ Follow the transport instructions on the packaging

❒ Transport components with care to avoid damage

❒ Protect the packaging against damp conditions

❒ Pay attention to the pallet's centre of gravity when lifting

❒ Position a fork-lift or similar lifting device at the pallet and bring in the components

If the firewood boiler cannot be brought in on the pallet:

❒ remove the cardboard and take the boiler off the pallet

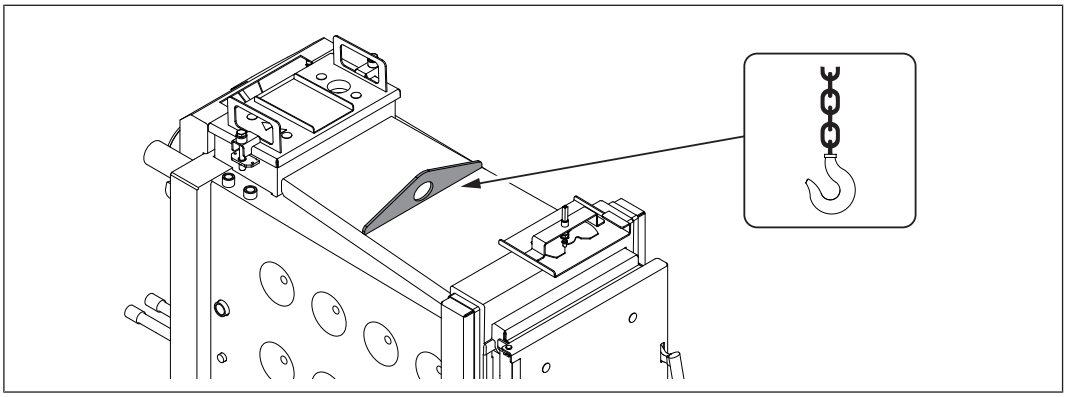
➲ "Remove boiler from pallet" [▸ 36]

If the pellet unit cannot be brought in on the pallet:

❒ Remove the cardboard and take the pellet unit off the pallet

➲ "Removing the pellet unit from the pallet" [▸ 37]

Positioning using a crane

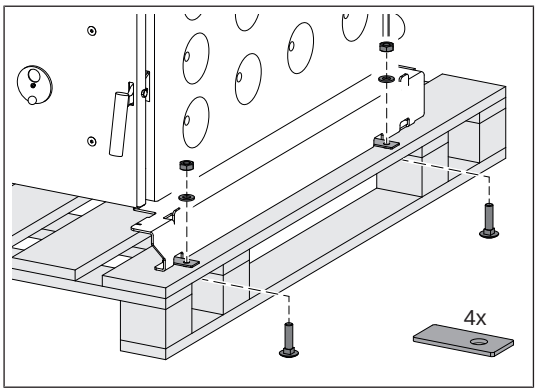


❒ Attach the crane hook to the attachment point correctly and position the boiler

5.4 Positioning at the installation site

5.4.1 Remove boiler from pallet

❒ Remove the cardboard box with the insulation and controller from the boiler and put it in a safe place

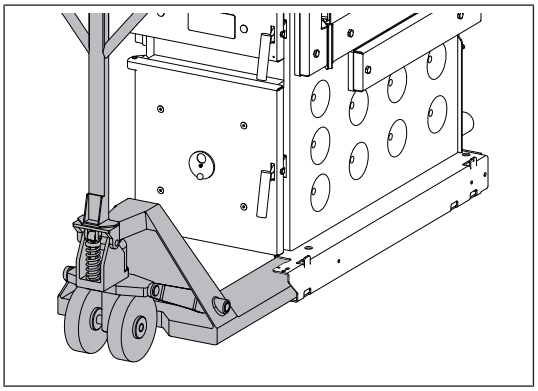


❒ Dismantle the transport locks on both sides of the boiler

❒ Lift boiler from pallet

TIP: use Froling's KHV 1400 boiler lifting system to help remove the pallet!

Transport the boiler with a lift truck



❒ Position a fork-lift or similar lifting device with a suitable load-bearing capacity at the base frame

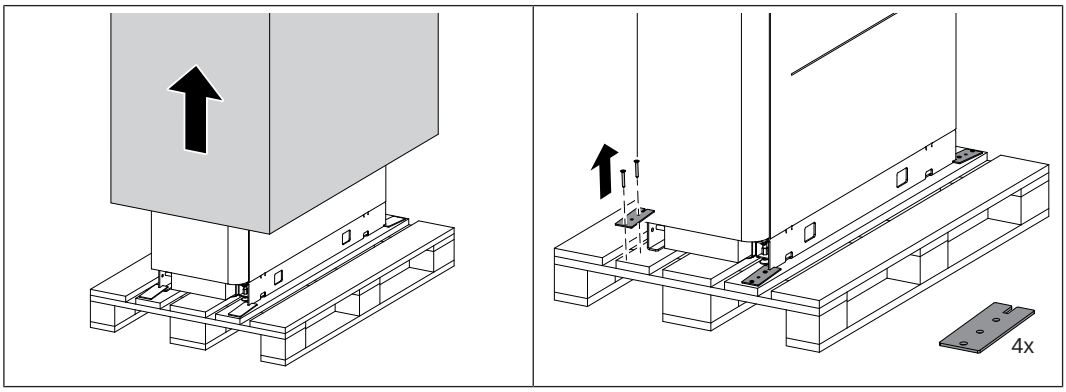
❒ Lift it and transport it to the intended position

↳ Observe the operating and maintenance areas of the equipment in the process!

TIP: To make it easier to fit the cladding, position the boiler in free space in the installation room and only move it to its final position just before connecting it hydraulically.

5.4.2 Removing the pellet unit from the pallet

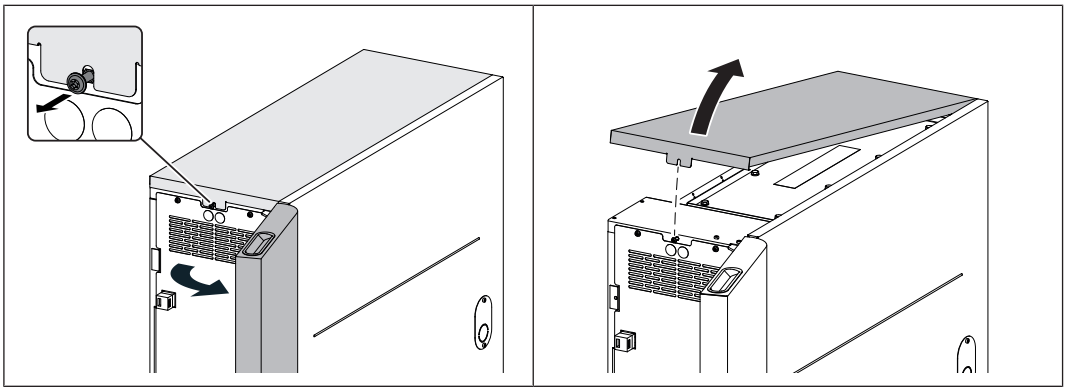
Components removed in the following steps must be kept in a dry and dust-free protected location until they are refitted.



❒ Lift off the cardboard box

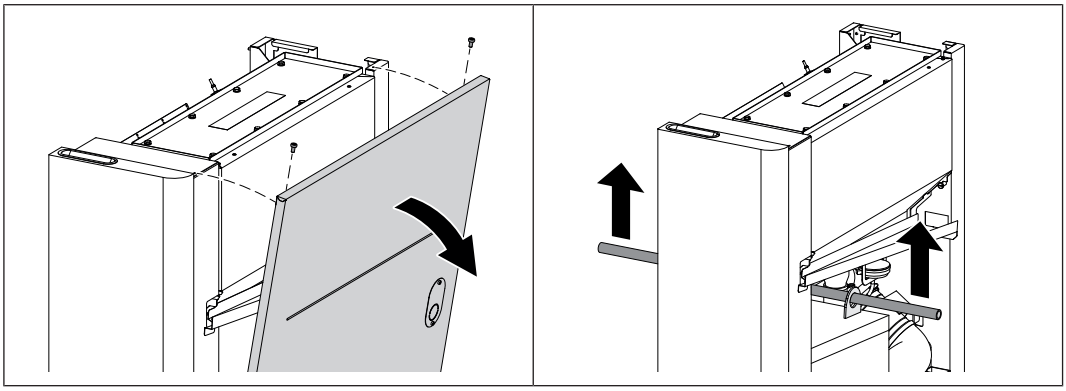
❒ Remove the transport restraints from the pallet

❒ Lift the pellet unit from the pallet



❒ Open the front door and loosen the retaining screw located behind it
- 1x M5 x 25 lens-head screw

❒ Lift the cover forward slightly and remove it towards the front



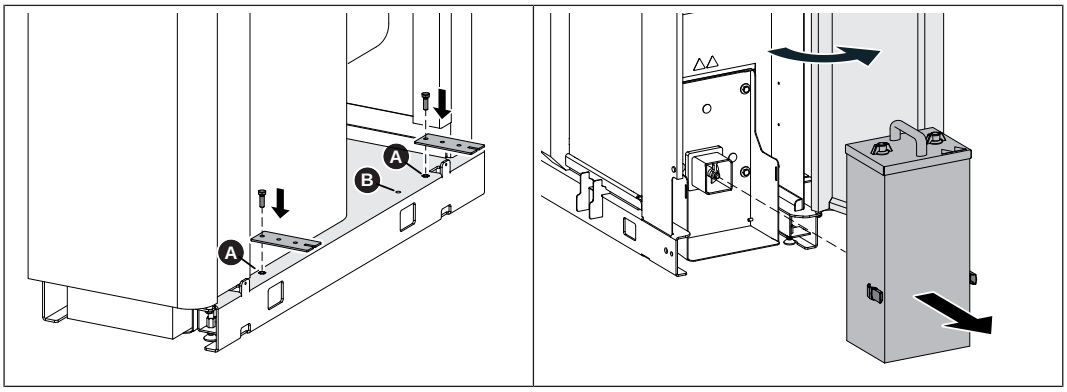
❒ Remove the side panel on the pellet unit
- 2x M5 x 10 lens-head screws

❒ Feed the appropriate pipe (e.g. 1” pipe) through both eyelets and lift the pellet unit off the pallet

↳ Weight of the pellet unit: approx. 200 kg

5.4.3 Transport the pellet unit with a pallet truck

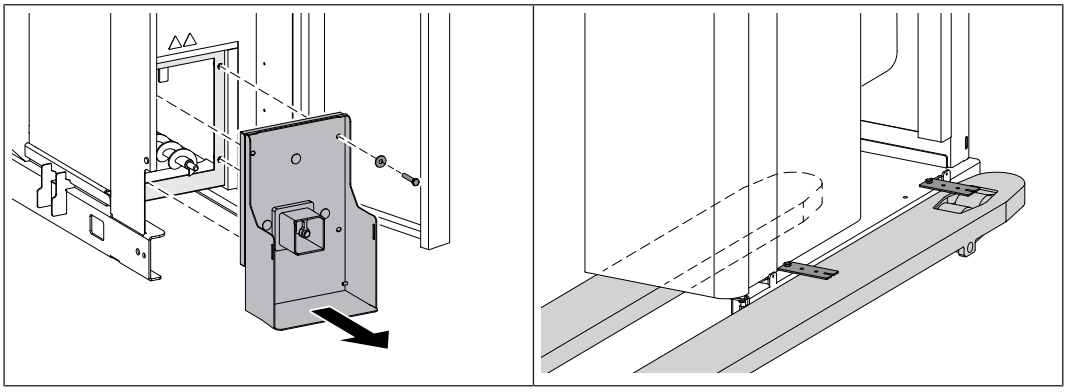
IMPORTANT: Lift the pellet unit with a pallet truck only to the extent that it can be transported safely. A second person is required to prevent tipping. It is not permissible to use a forklift truck for transport.



❒ Fit the previously removed transport restraints in the positions provided (A) on the base of the pellet unit

↳ An alternative screw position (B) can be used if the pallet truck has short forks

❒ Open the front door and pull out the ash container



❒ Dismantling the ash console
- 4x M8 x 45 hexagon head screws

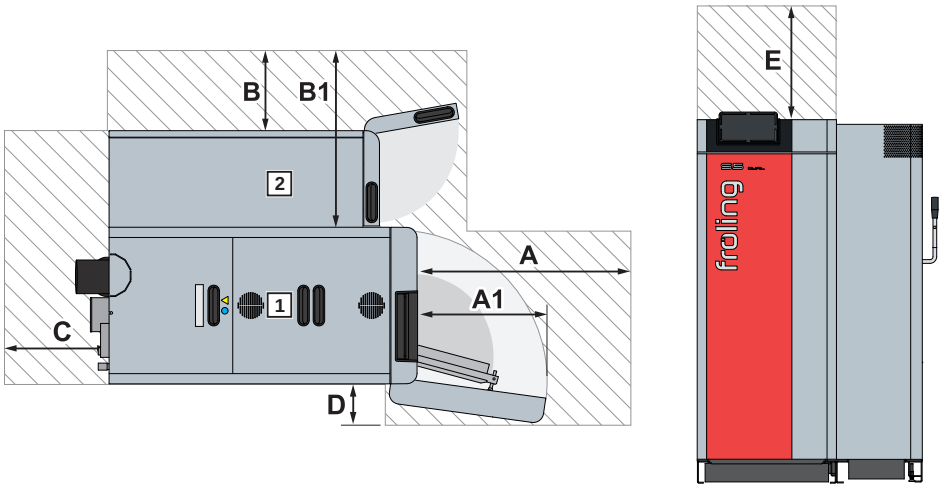
❒ Position the pallet truck under the pellet unit and transport it

5.4.4 Operating and maintenance areas of the equipment

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

TIP: For optimum filling of the boiler with fuel we recommend that the entire door area of the insulated door should be kept clear (opening angle approx. 100°).

Operating and maintenance areas of the S5 Dual



1... S5 Turbo firewood boiler | 2... pellet unit

	22-30	32-48
A	800 mm	
A1	550 mm	650 mm
B	300 mm[1)]	
B1	670 mm	
C	400 mm	
D	150 mm	
E	500 mm[2)]	

1. The maintenance area on the right can be reduced to 100 mm in exceptional circumstances, provided access to the rear of the boiler is guaranteed. In this case, the boiler can only be serviced from the rear. The maintenance area at the rear (C) is increased to 500 mm.
2. Maintenance area to remove the WOS springs upwards

6 Installation

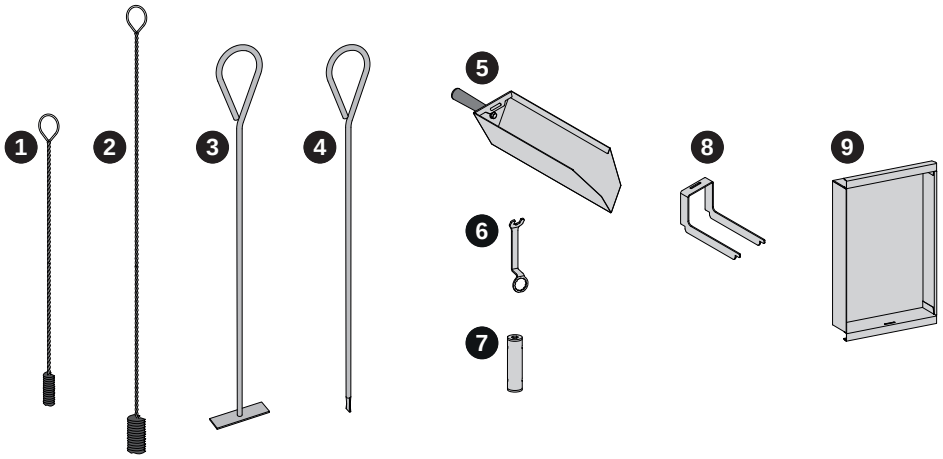
6.1 Required tools and equipment

The following tools and resources are required for assembly:

- ❒ Spanner or box wrench set (widths across flats 8 - 32 mm)
- ❒ Set of Allen keys
- ❒ Flat head and cross-head screwdrivers
- ❒ Hammer
- ❒ Diagonal cutting pliers
- ❒ Half-round file
- ❒ Power drill or cordless screwdriver with Torx bit insert
- ❒ Stepladder

6.2 Accessories supplied

The following accessories are included in the delivery and are necessary exclusively for operation of the boiler.



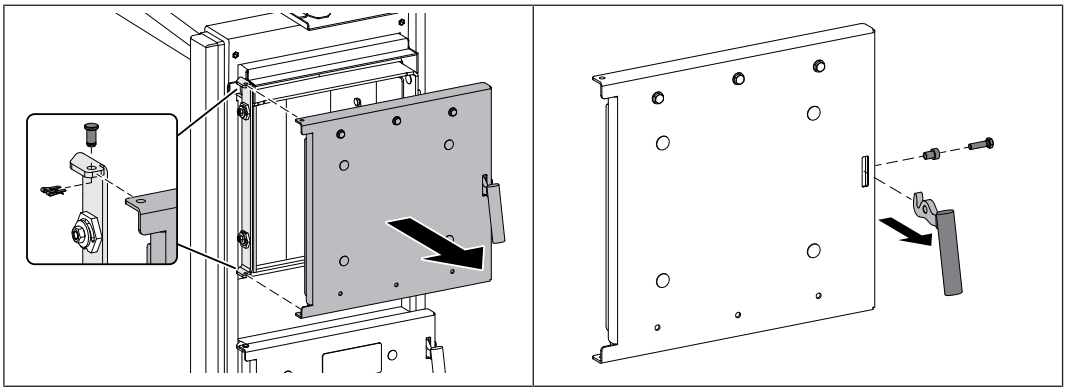
1	Cleaning brush 30 x 20 x 900	**6**	Spanner for door mountings
2	Cleaning brush Ø 54 x 1350	**7**	Socket wrench for Lambda probe and heat exchanger cover
3	Flat scraper	**8**	Installation jig for WOS-hangers
4	Stoking rod	**9**	Ashcan
5	Ash shovel		

6.3 Before installation

6.3.1 Changing door stops (as needed)

The following steps are illustrated using the fuel loading door when converting from the left to right door stop. Perform these steps in the same way for the pre-heating and combustion chamber door.

RECOMMENDATION: For easier operability, we recommend that the door stop of the existing pellet unit is positioned on the left side of the boiler.

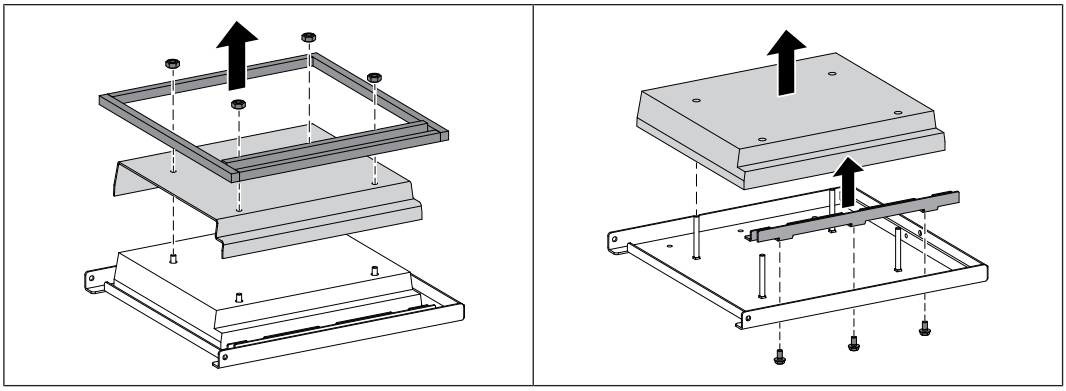


❒ Open the fuel loading door

❒ Remove the shaft retainers, pull out the hinge pins and take off the fuel loading door

❒ Undo the hexagonal screw on the fuel loading door and remove the door handle and flange bushing

For the fuel loading door:

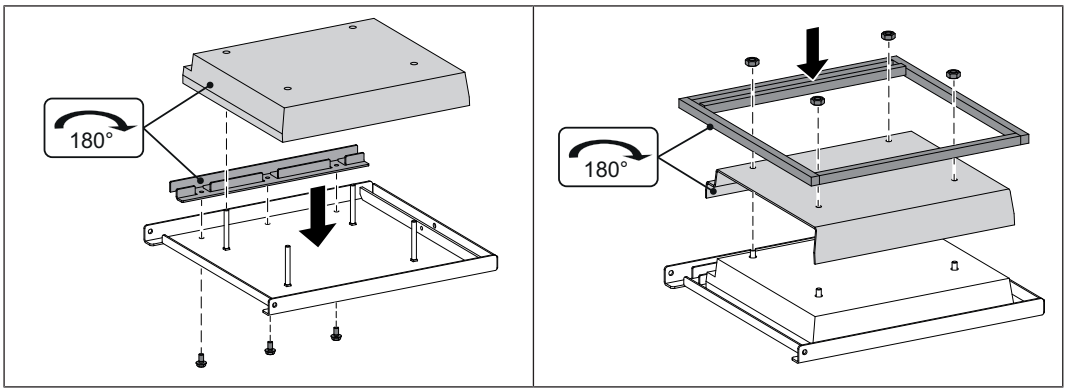


❒ Carefully dissolve the seal

❒ Loosen the M8 hexagonal nuts and remove the protective plate

❒ Remove the insulating panel and dismantle the guide plate
- 3 x M8 x 16 hexagonal screws

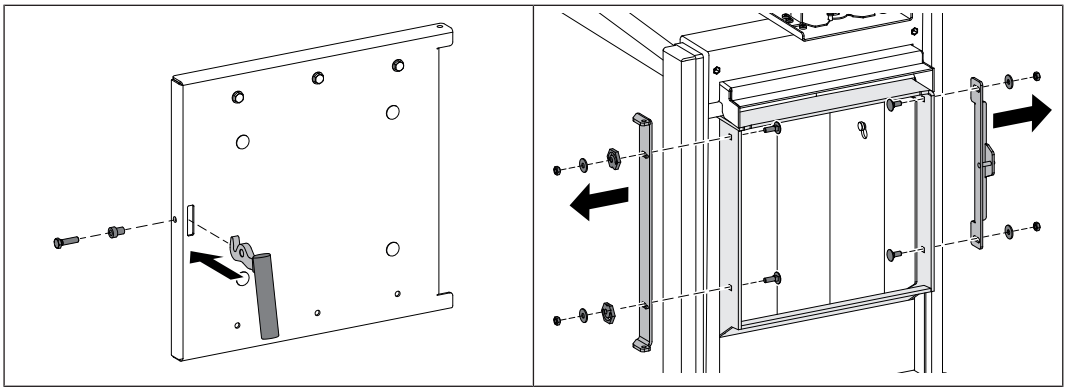
For the fuel loading door:



❒ Turn the insulation panel 180° and thread it onto the screws

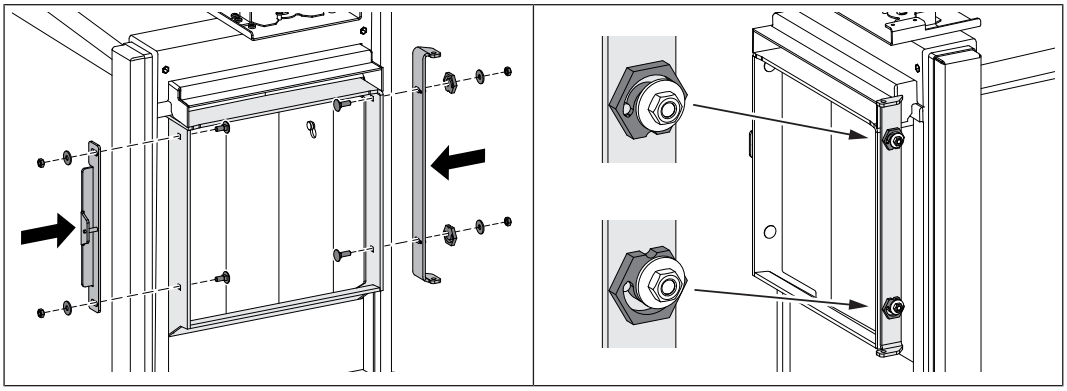
❒ Fitting the guide plate
- 3 x M8 x 16 hexagonal screws

❒ Fit the protective plate with M8 hexagonal nuts and insert the seal



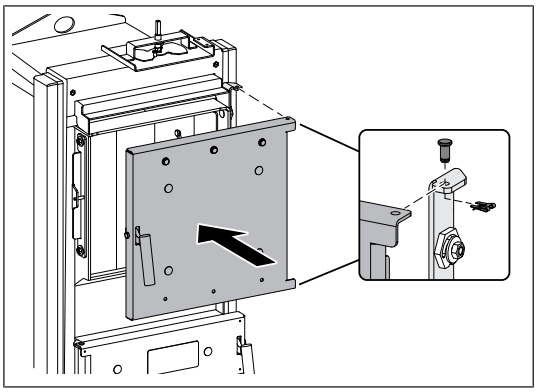
❒ Slide the door handle into the slot as shown, insert the flange bushing and secure the door handle with the hexagonal screw

❒ Dismantle the hinge and locking plate on the door frame



❒ Fit the hinge and locking plate on opposite sides of the door frame

↳ Position the locking cam on the hinge as shown



❒ Position the fuel loading door on the hinge and secure it with the top and bottom hinge pins

❒ Slide the shaft retainers on to the hinge pins

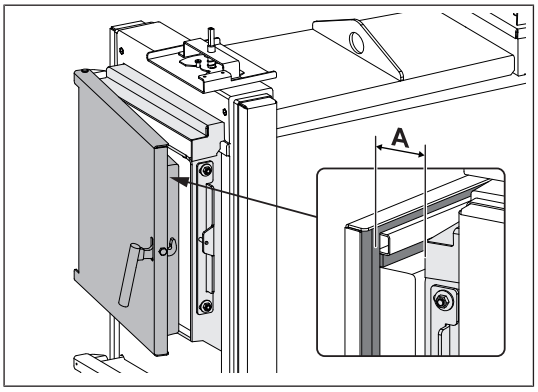
IMPORTANT! After changing over the door stops, check the seal and adjust it as necessary.

➲ "Checking the seal on the doors" [▸ 44]

➲ "Adjusting the doors" [▸ 45]

6.3.2 Checking the seal on the doors

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

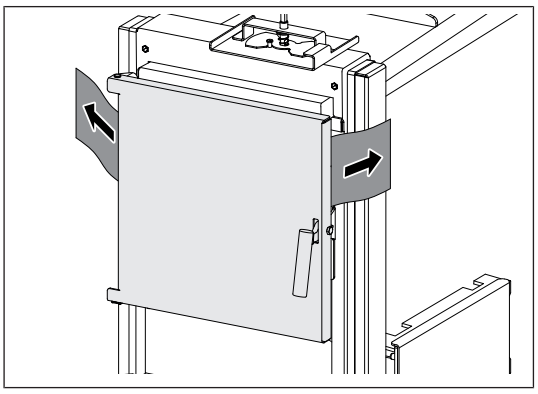


❒ Close the door

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

↳ No resistance felt:
Move hinge backwards
➲ "Adjusting the doors" [▸ 45]

↳ Resistance can be felt when there is a gap of more than 3 cm:
Move hinge forwards
➲ "Adjusting the doors" [▸ 45]



❒ Open the door

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

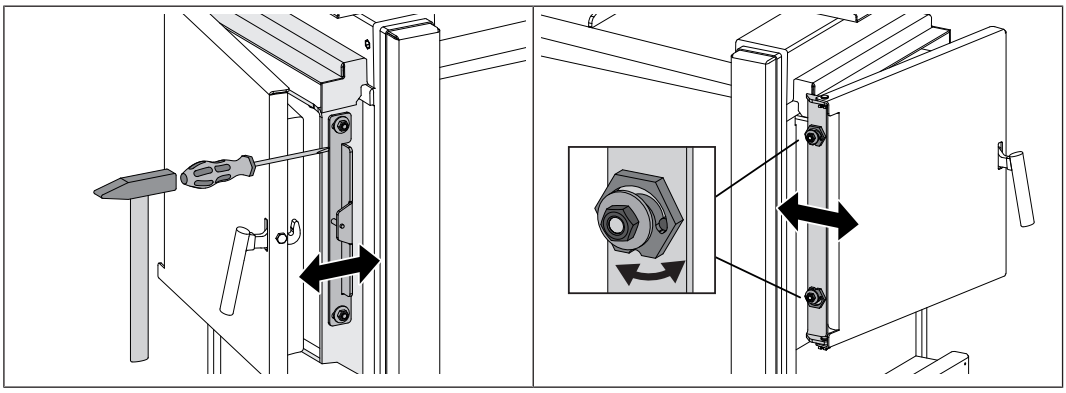
❒ Try to pull out the sheet of paper

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

↳ If the paper can be removed:
The door is not sealed - Move hinge or locking plate backwards
➲ "Adjusting the doors" [▸ 45]

6.3.3 Adjusting the doors

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



❒ Loosen the nuts on the locking plate

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

❒ Tighten the nuts on the locking plate

❒ Loosen the nuts on the door hinge

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

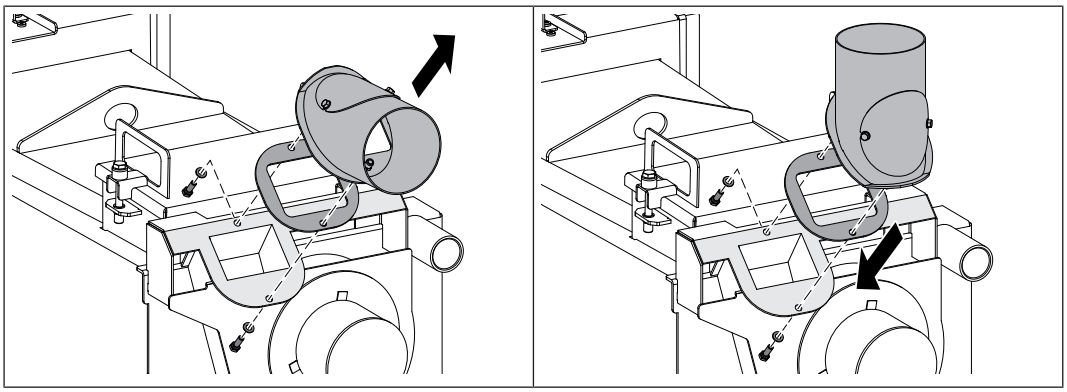
❒ Tighten the nuts on the hinge

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

❒ Once the doors have been adjusted, check them again for leaks, ➲ "Checking the seal on the doors" [▸ 44]

6.3.4 Changing over the flue gas pipe connection to the top

The standard arrangement is for the boiler flue gas pipe connection to be at the rear. Where required the flue gas pipe connection can be changed to the top

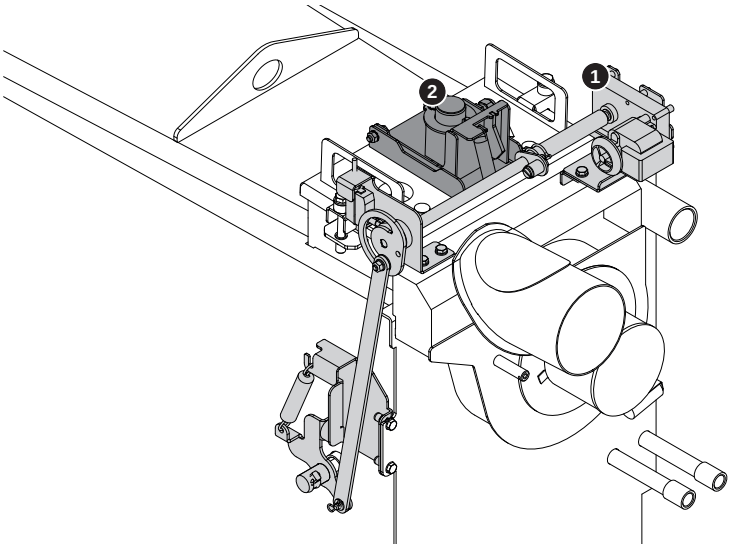


❒ Remove the connecting piece

❒ Turn the flue gas pipe connection upwards and refit the connecting piece including the gasket
- 2 x M8 x 25 hexagonal screws

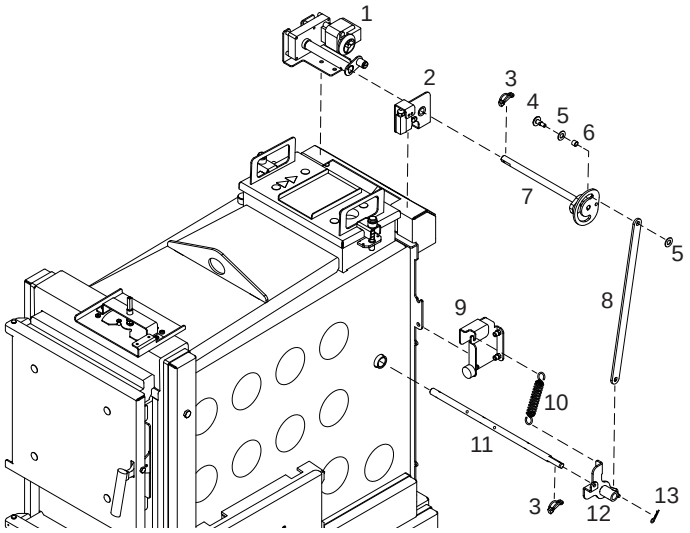
IMPORTANT! Replacement gasket included in the boiler accessory pack.

6.4 Fitting accessory components

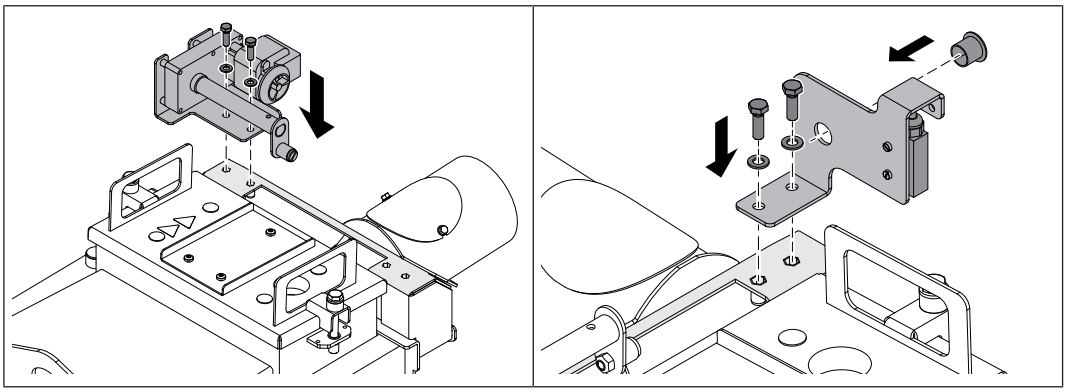


1	➲ "Automatic WOS" [▸ 47]
2	➲ "Electrostatic particle separator (ESP)" [▸ 51]

6.4.1 Automatic WOS



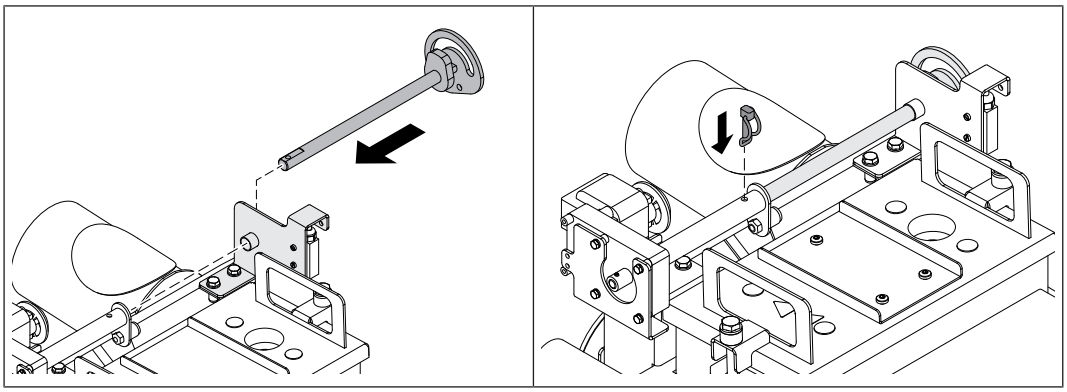
Item	Qty.	Designation	Item	Qty.	Designation
1	1	Drive bracket	**8**	1	Driving plate
2	1	Bearing bracket	**9**	1	Bracket
3	2	Pipe locking pin Ø6 / Ø22	**10**	1	Spring
4	1	Bolt Ø24 x 30	**11**	1	WOS shaft
5	2	Thrust washer	**12**	1	Swivelling lever
6	1	Plain bearing	**13**	1	Spring cotter Ø1.9 x 35
7	1	Drive shaft with washer			



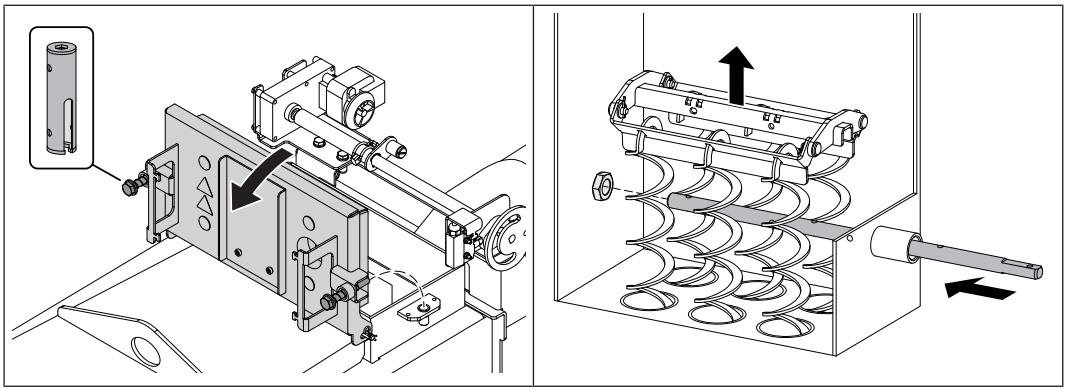
❒ Mount the drive bracket on the boiler body
- 2x M8 x 25 hexagonal screws

❒ Insert the plain bearing in the bearing bush

❒ Mount the bearing bracket on the boiler body
- 2x M8 x 25 hexagonal screws



❒ Insert drive shaft and washer into plain bearing and secure with Ø6 / Ø22 pipe locking pin

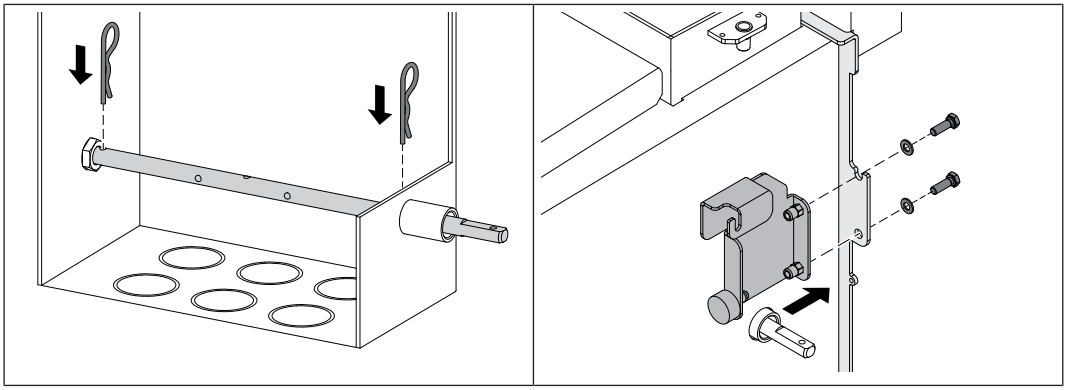


❒ Loosen the screws on the heat exchanger cover and open the heat exchanger cover forwards

❒ Pull the WOS suspension links up and out of the heat exchanger

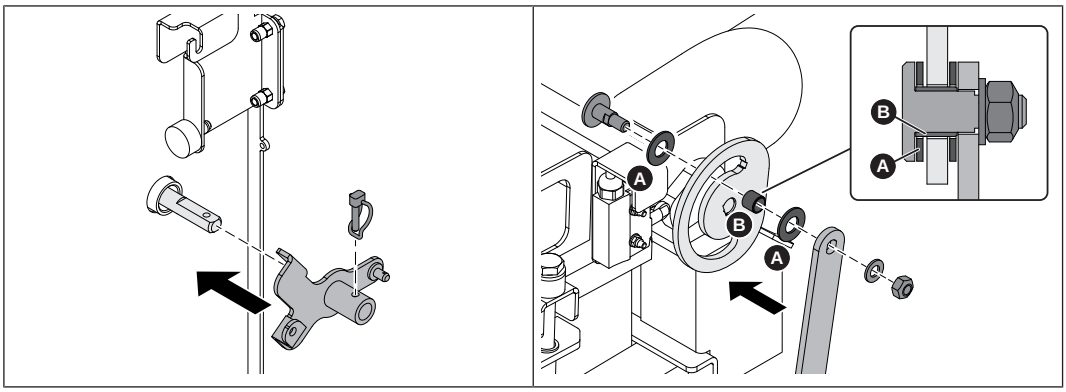
❒ Insert the WOS shaft into the heat exchanger

IMPORTANT! If there are space constraints, the WOS shaft can also be inserted on the left-hand side of the boiler.



❒ Align the WOS shaft and secure it on both sides with Ø4 x 60 spring cotter

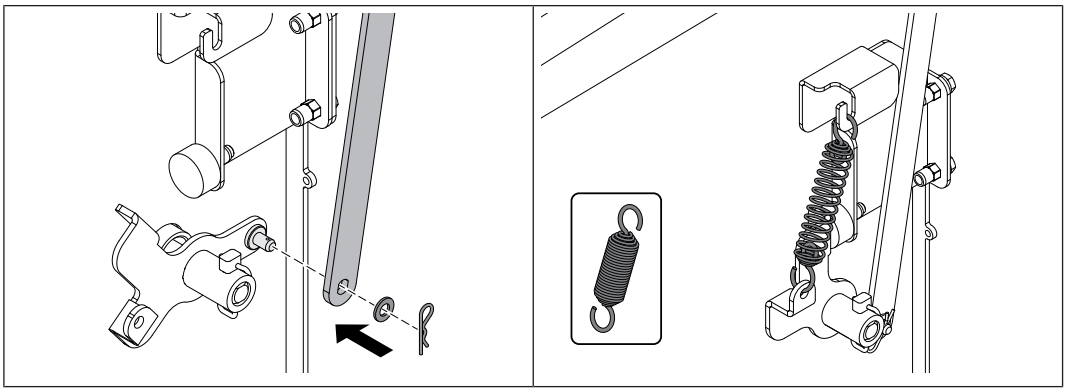
❒ Fitting the bracket to the boiler body
- 2x M8 x 25 hexagonal screws



❒ Attach swivelling lever to WOS shaft with Ø6 / Ø22 pipe locking pin

❒ Attach the driving plate and plain bearing to the washer as shown

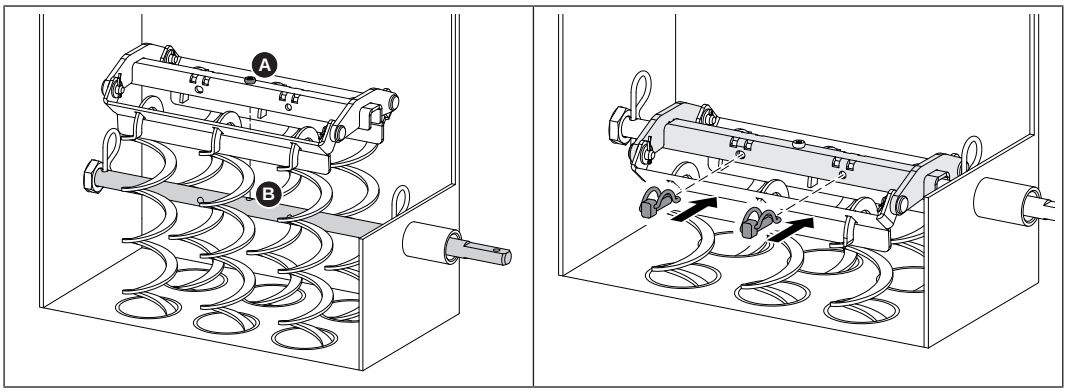
↳ Slide the plain bearing washers (A) on to the plain bearing (B)



❒ Secure the driving plate to the bolt of the swivelling lever with a Ø1.9 x 35 spring cotter

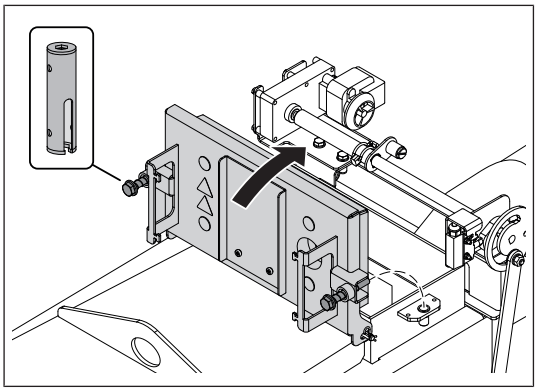
❒ Attach tension spring to swivelling lever and bracket

IMPORTANT! The following steps in this section do not apply to boilers with an electrostatic particle separator.



❒ Place the WOS suspension links on the WOS shaft, inserting the screw (A) into the hole (B)

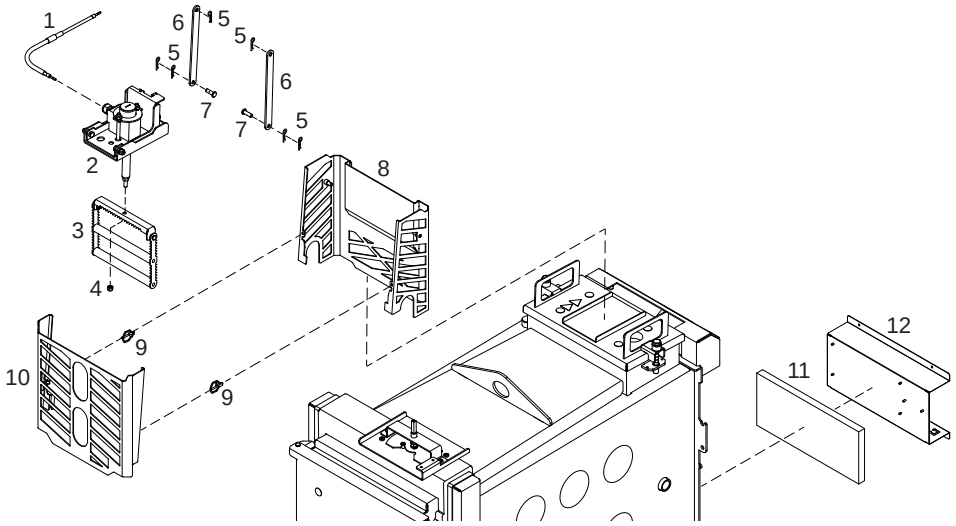
❒ Secure the WOS suspension links using two Ø6 / Ø22 pipe locking pins



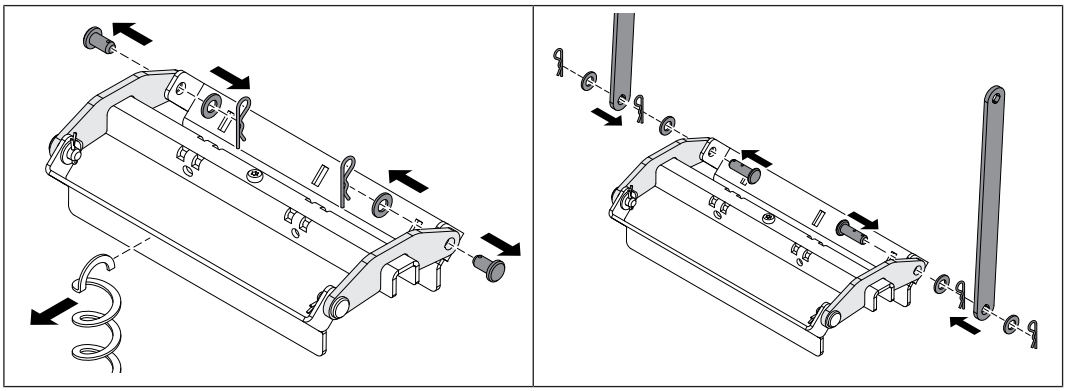
❒ Close the heat exchanger cover and secure it with screws

6.4.2 Electrostatic particle separator (ESP)

IMPORTANT! Electrostatic particle separators (ESP) can be used only in combination with automatic WOS.



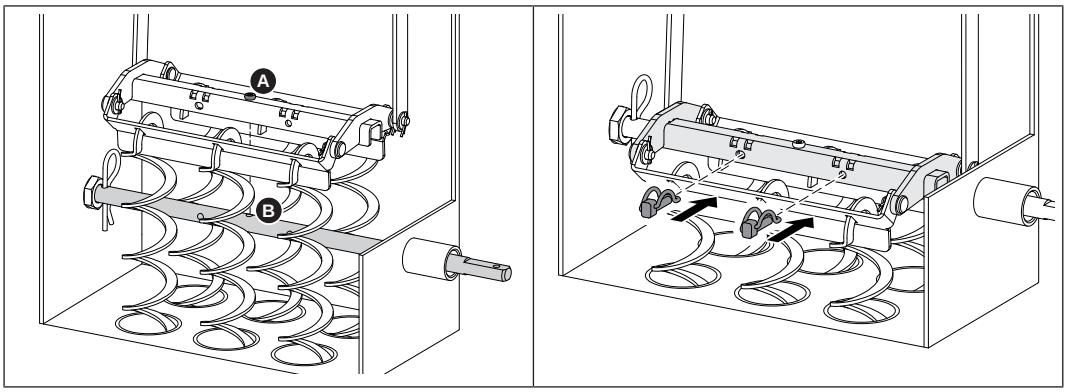
Item	Qty.	Designation	Item	Qty.	Designation
1	1	HV pipe, 2 m	**7**	2	Eyebolt Ø14 x 28
2	1	Electrode unit	**8**	1	Rear cleaning basket
3	1	Spray electrode	**9**	2	Locking pin Ø3.8
4	1	Lock nut M8 (copper)	**10**	1	Front cleaning basket
5	6	Spring cotter Ø1.9 x 35	**11**	1	Insulating panel 20 x 155 x 350
6	2	Driving plate	**12**	1	Controller box



❒ Unhook the WOS springs from the WOS suspension link

❒ Remove the spring cotter and pin on the rear suspension plate

❒ Fit the supplied eyebolt Ø14 x 28 including driving plate as shown



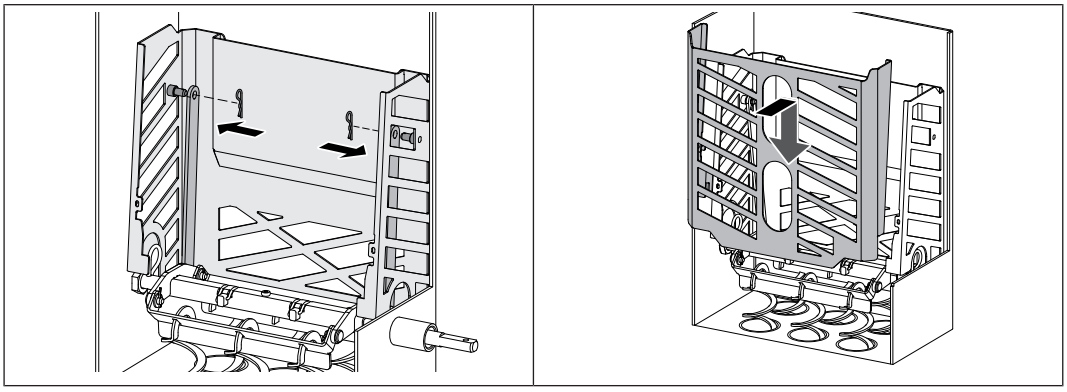
❒ Attach WOS springs to the suspension link

❒ Push the entire WOS suspension link into the heat exchanger

↳ Drive lever towards the back of the boiler

↳ Insert screw (A) into the hole (B) of the WOS shaft

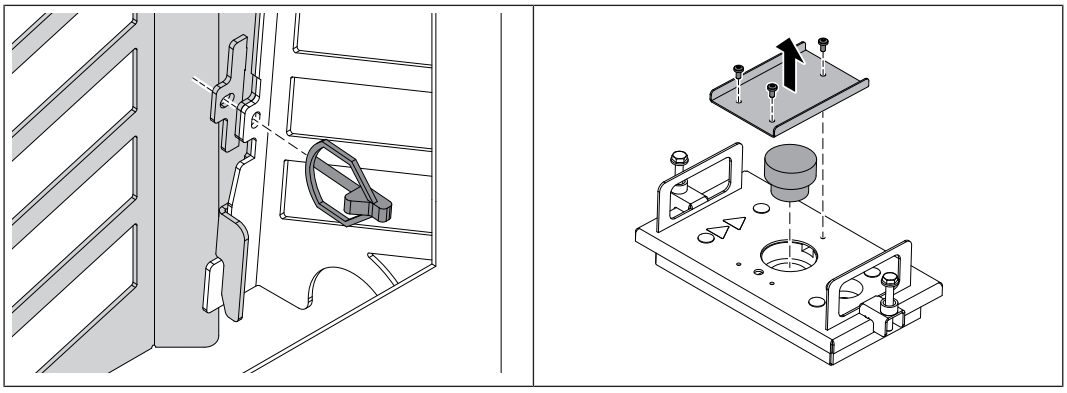
❒ Secure WOS suspension links using two pipe locking pins



❒ Insert the rear cleaning basket into the heat exchanger

❒ Mount the drive plate on the pin of the cleaning basket using a Ø1.9 x 35 spring cotter

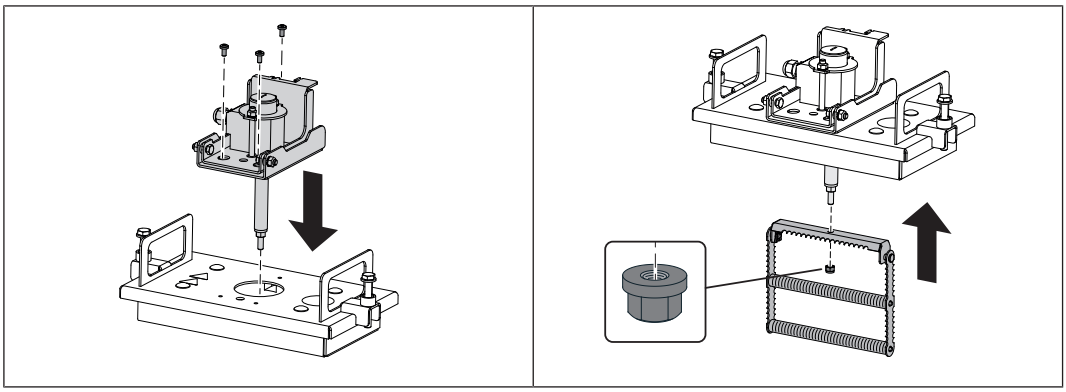
❒ Insert the front cleaning basket into the heat exchanger



❒ Connect both cleaning baskets with Ø3.8 locking pins

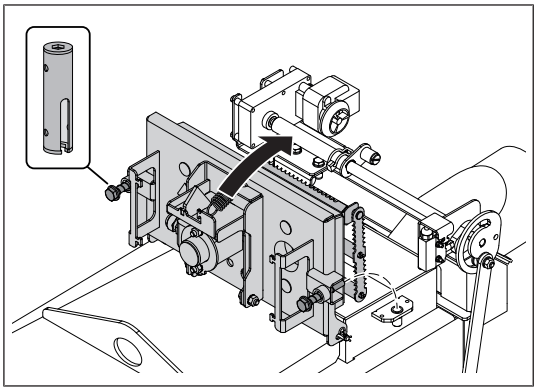
❒ Remove the cover on the heat exchanger cover
- 3x M5x10 lens-head screws

❒ Remove the round thermal insulation on the heat exchanger cover



❒ Fit the electrode unit to the heat exchanger cover
- 3x M5x10 lens-head screws

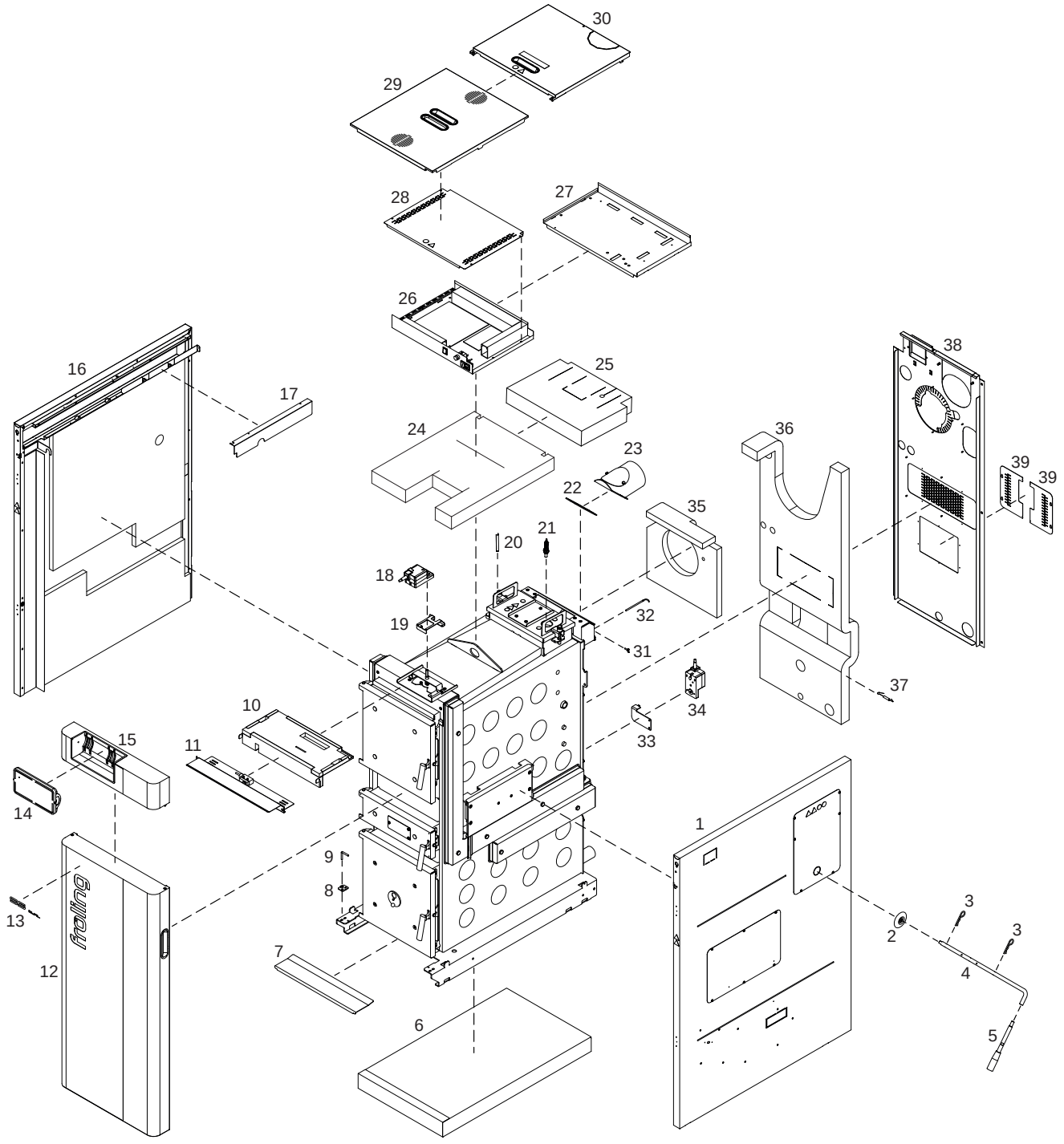
❒ Mount the spray electrode on the insulator
- 1x M8 flanged hexagon nut (copper)



❒ Close the heat exchanger cover and secure it with screws

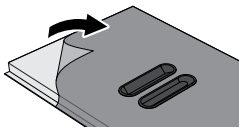
6.5 Installing a firewood boiler

6.5.1 Parts overview



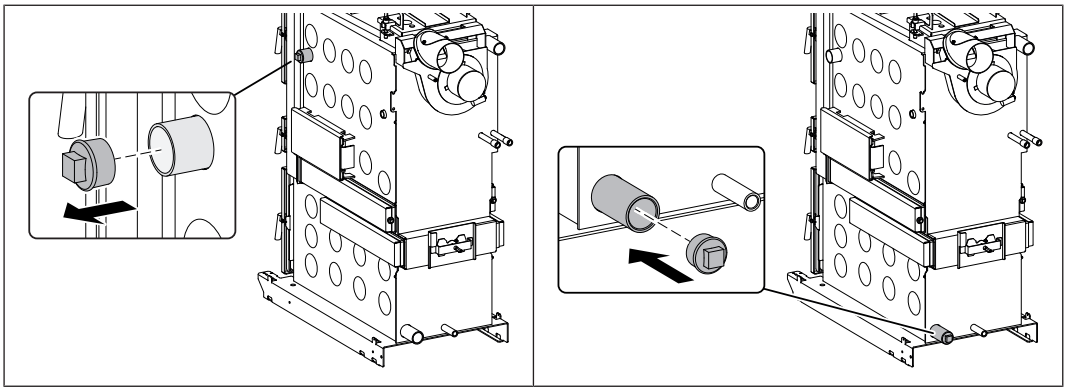
Item	Qty.	Designation	Item	Qty.	Designation
1	1	Side panel, right	**21**	1	Lambda probe
2	1	Plastic cover	**22**	1	Flue gas pipe connection port seal
3	2	Spring cotter	**23**	1	Flue gas pipe connection port
4	1	WOS shaft	**24**	1	TThermal insulation for the top of the boiler
5	1	WOS lever	**25**	1	Thermal insulation of heat exchanger cover
6	1	Floor insulation	**26**	1	Boiler controller
7	1	Bottom cover plate	**27**	1	Adapter plate (for S5 Turbo 32-48)
8	1	Door bearing, bottom	**28**	1	Controller cover
9	1	Door bearing pin	**29**	1	Cover, front
10	1	Thermal insulation primary air	**30**	1	Cover, rear
11	1	Cover plate with roller limit switch	**31**	1	Wing screw
12	1	Insulated door	**32**	1	Flue gas temperature sensor
13	1	“S5 Turbo” sticker	**33**	1	Torque support for servo-motor secondary air
14	1	7” touch screen	**34**	1	Secondary air servo-motor (cable length 3.0 m)
15	1	Bracket for the controller	**35**	1	Flue gas pipe thermal insulation
16	1	Side panel, left	**36**	1	Thermal insulation for back panel
17	1	Cable duct cover	**37**	10	Tension spring
18	1	Primary air servo-motor (cable length 1.5 m)	**38**	1	Back panel
19	1	Torque support for servo-motor primary air	**39**	2	Servo-motor cover
20	1	Compression spring for boiler sensor and sensor for high-limit thermostat (STL)			

6.5.2 Installing the cladding

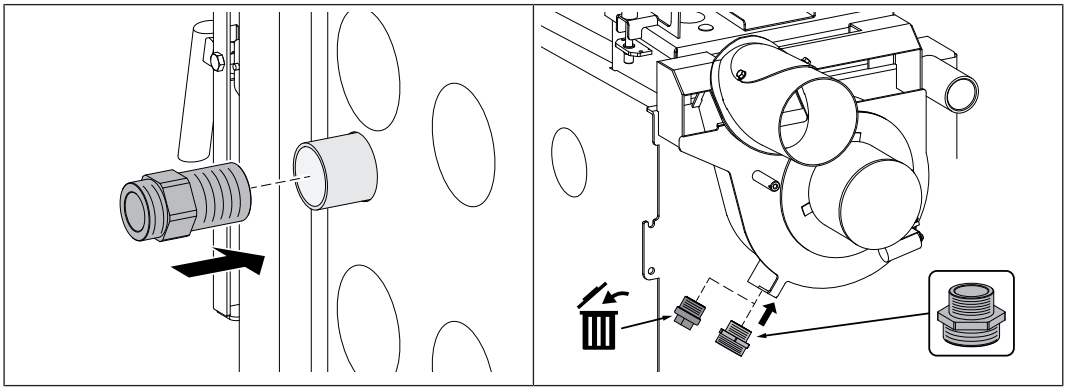


IMPORTANT: The individual parts of the boiler insulation covered with a protective film. The protective film must be removed before proceeding with the installation!

The following steps show the installation of the cladding with door stop of the **insulated door** on the **left-hand side of the boiler**. If the door stop is on the right-hand side of the boiler, the steps must be carried out according to the mirror image



❒ Remove the blanking plug on the side return connection and seal it at the rear return connection

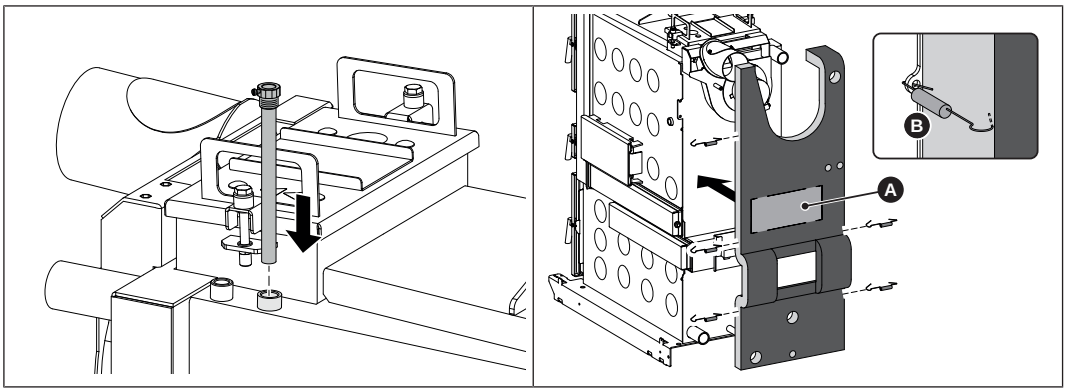


❒ Seal the double nipple at the side return connection

❒ Remove the blanking plug from the induced draught housing

↳ The blanking plug is no longer required

❒ Sea the double nipple for the flue gas recirculation hose

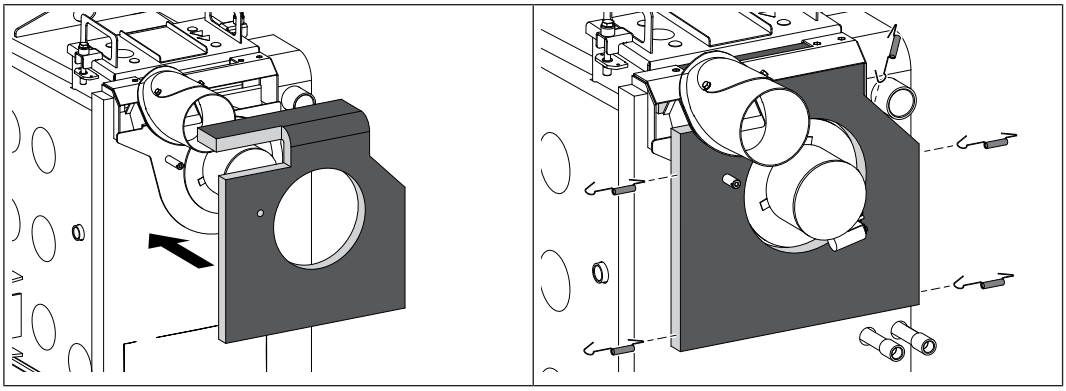


❒ Seal the immersion sleeve of the thermal discharge valve in the front sleeve on the boiler body

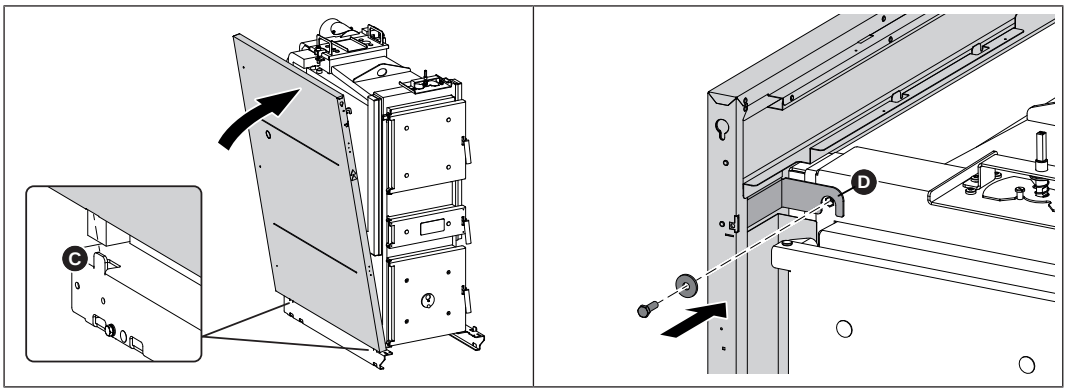
↳ Thermal discharge valve not included in the scope of supply

❒ For boilers with an electrostatic particle separator:
Remove the perforation (A) of the rear thermal insulation

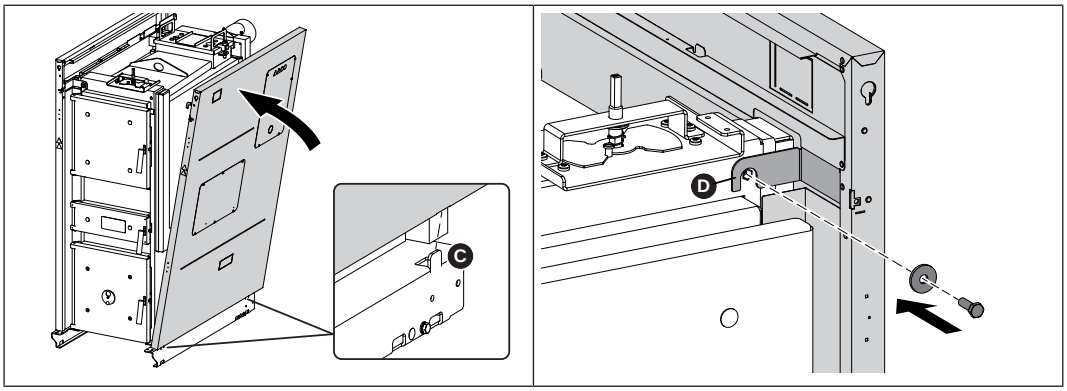
❒ Position the rear thermal insulation on the back wall and attach to the boiler using 5 tension springs (B)



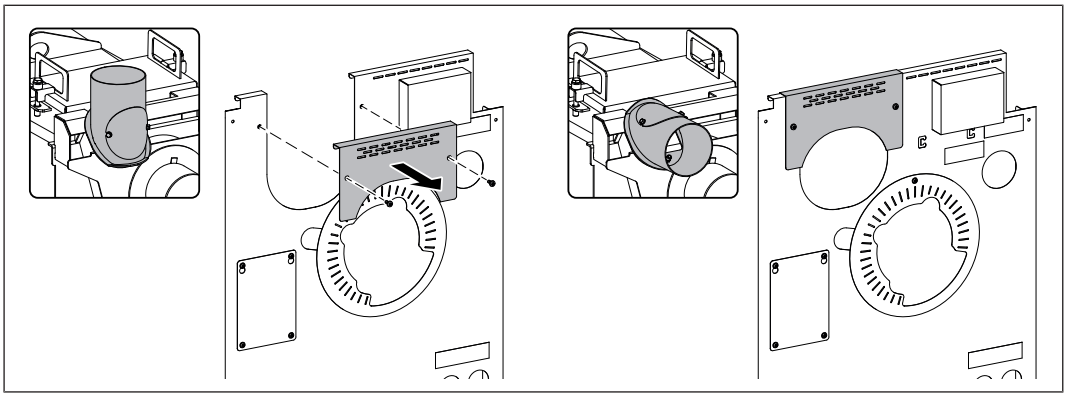
❒ Position the thermal insulation on the induced draught unit housing and secure with 5 tension springs



❒ Thread the left side panel on to the lugs (C) and secure to the bracket (D) at the front
- 1 x M8 x 25 hexagonal screw

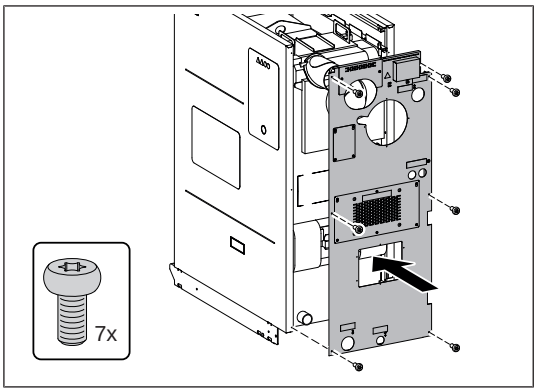


❒ Thread the right side panel on to the lugs (C) and secure it to the bracket (D) at the front
- 1 x M8 x 25 hexagonal screw



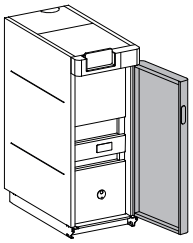
❒ For boilers with flue gas pipe connection at the top:
Remove the cover plate from the back panel
- 2x M5 x 12 lens-head screws

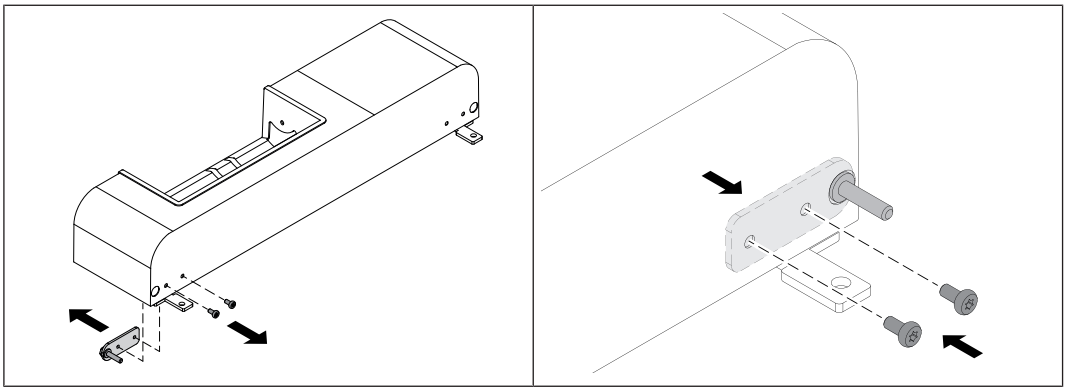
❒ For boilers with flue gas pipe connection at the rear:
Cover plate remains mounted on the back panel



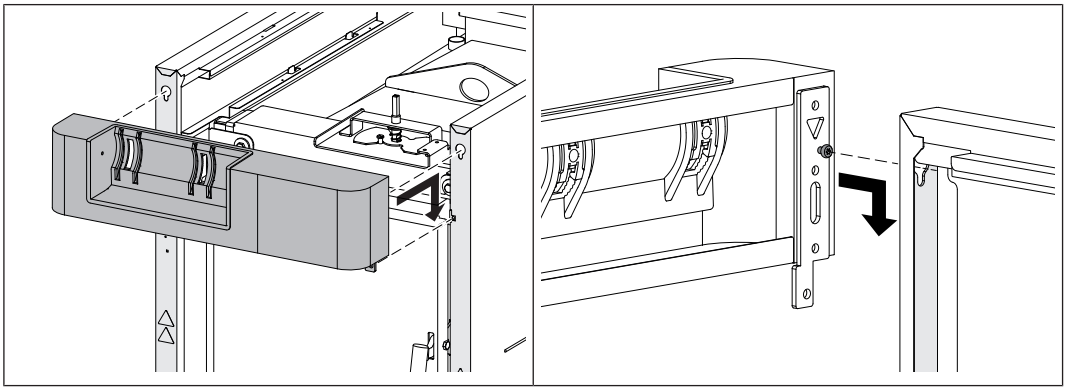
❒ Installing the back panel
- 7x M5 x 10 lens-head screws

For right-hand door stop



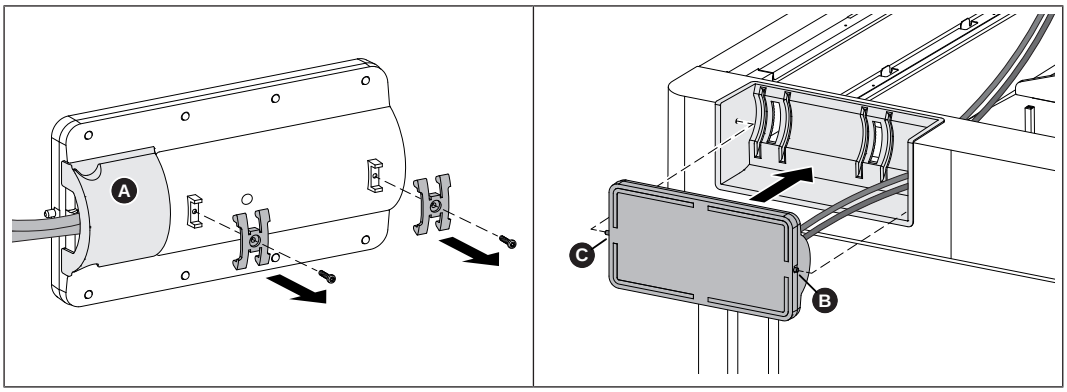


❒ Remove the insulating door bearing and fit on the opposite side as shown
- 2x M5 x 10 lens-head screws

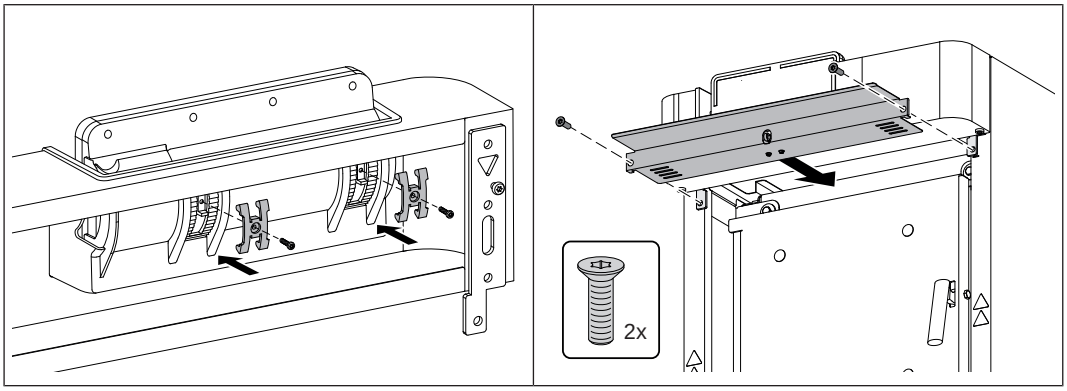


❒ Insert the control by engaging with screw heads in the cutouts on the side panels
- 2x M5 x 10 lens-head screws

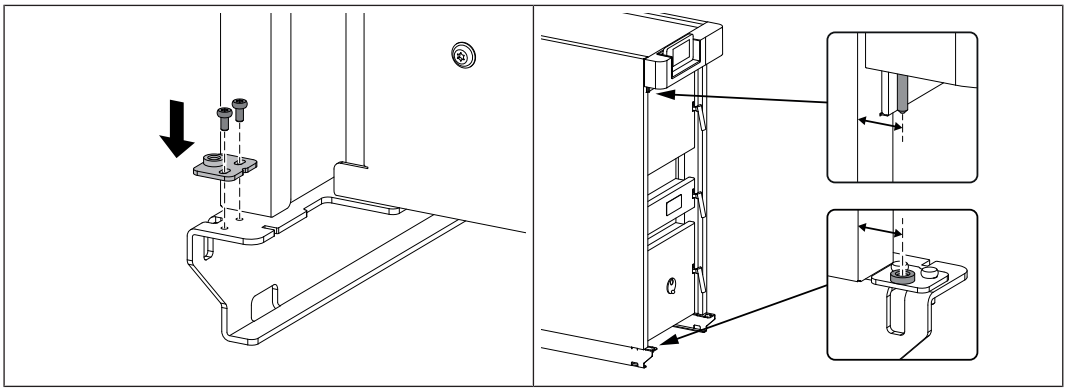
❒ Tighten the inserted screw heads from the inside



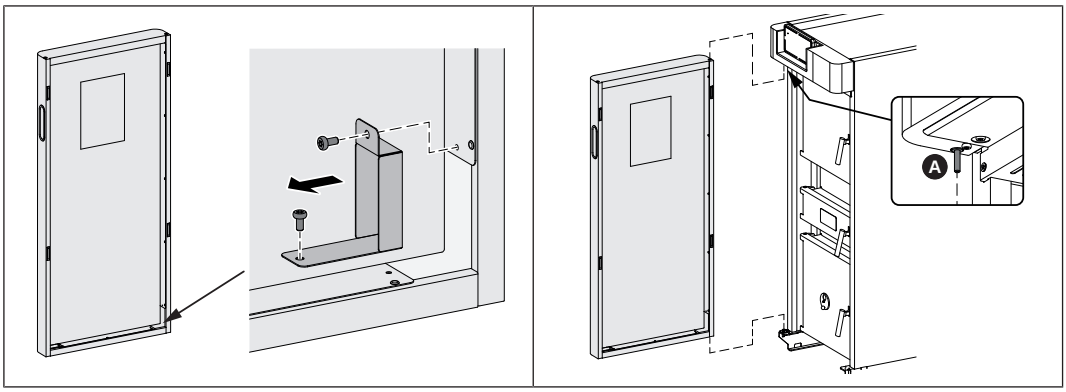
- ❒ Check the back of the display to ensure both plugs are connected, remove cover (A) if necessary
- ❒ Remove the retaining clips on the back of the display
  - 2x M3 x 10 lens-head screws
- ❒ Pass the display cable through the recess on the bracket
- ❒ Thread the right pin (B) of the display into the bracket and engage the left pin (C) on the opposite side



- ❒ Fix the display to the bracket with retaining clips
  - 2x M3 x 10 lens-head screws
- ❒ Hook the spacer plate under the control panel (A) and secure it together with the control panel
  - 2x countersunk head screws M5x16

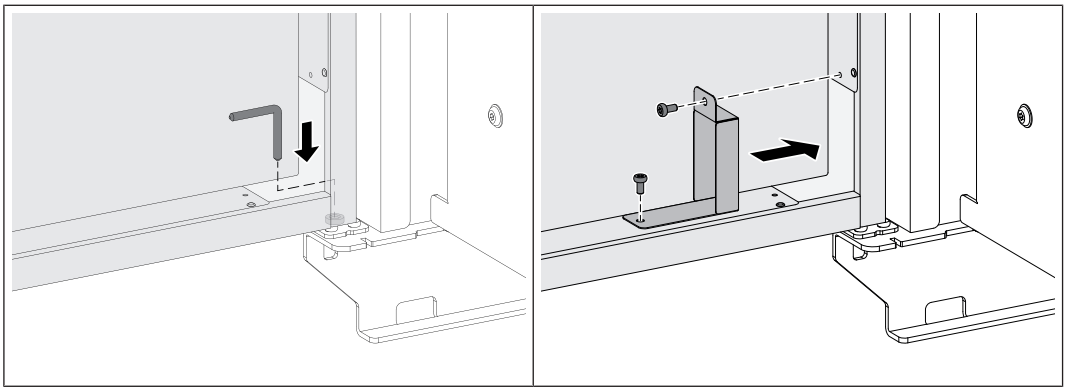


- ❒ Mount the lower door bearing on the stop side of the boiler base
  - 2x M5 x 10 lens-head screws
- ❒ Measure the distance between the upper door pin and the side panel and set the same distance on the lower door bearing



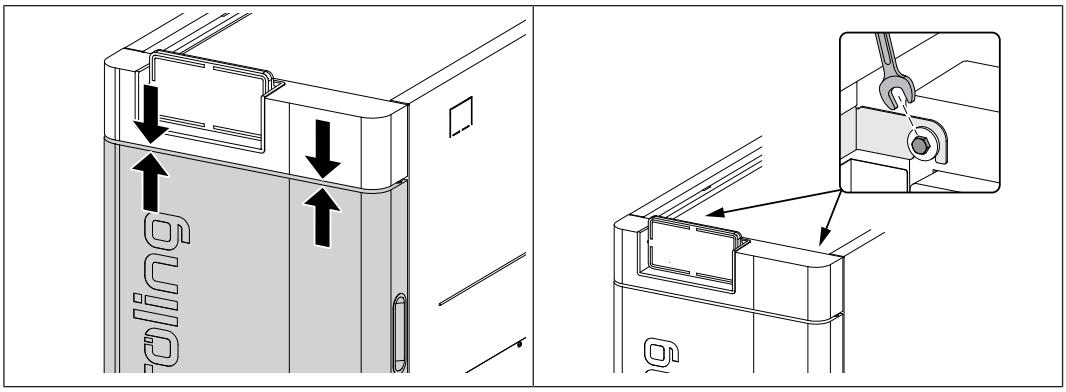
❒ Remove the cover in the insulated door on the stop side
- 2x M5 x 10 lens-head screws

❒ Thread the top of the insulated door into the door bearing (A)



❒ Secure insulated door on the underside with door pin

❒ Fit the cover to the insulated door
- 2x M5 x 10 lens-head screws

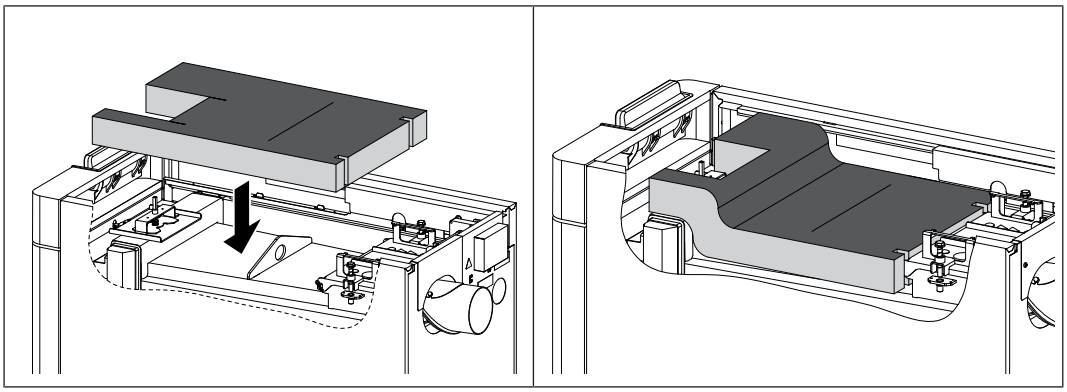


❒ Measure the gap between the insulated door and the control on the left and right

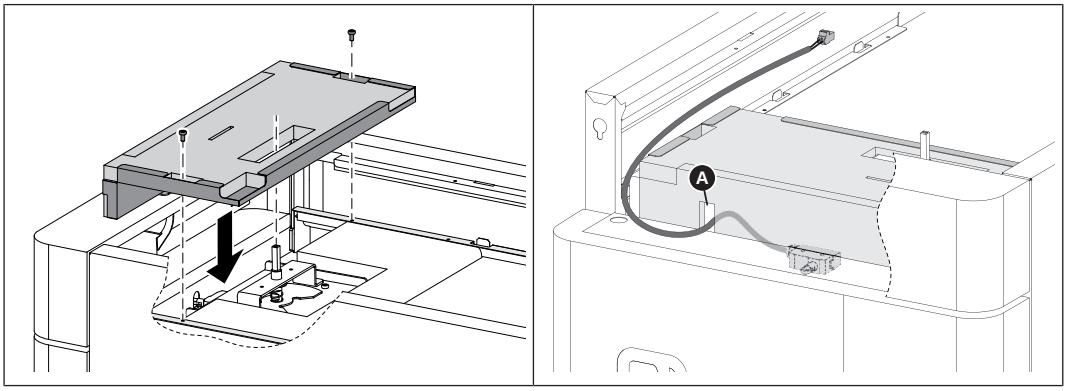
↳ The two distances must both be the same

↳ If necessary adjust the side panels at the brackets

❒ When set correctly, tighten the hexagonal screws on both brackets



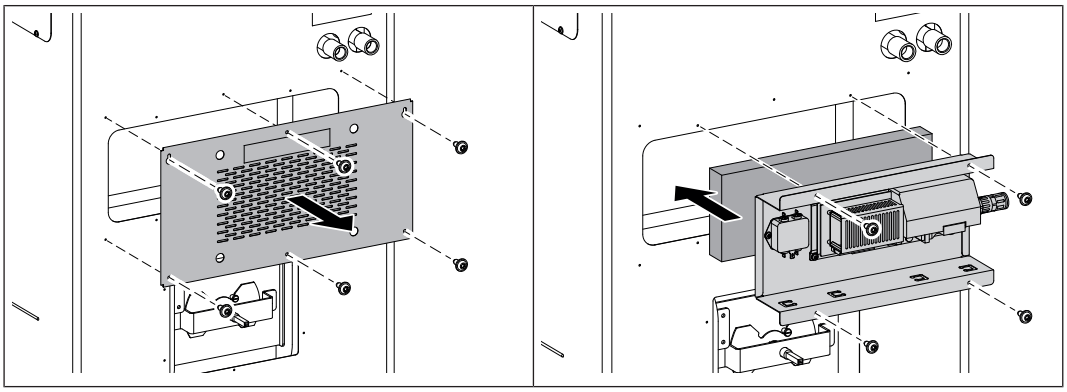
❒ Place the thermal insulation on the top of the boiler as shown



❒ Position the thermal insulation on the air damper and mount on the side panels
- 2x M5 x 10 lens-head screws

❒ Guide the door contact switch cable forwards via the cut-out (A) in the thermal insulation and lay it in the left-hand cable duct

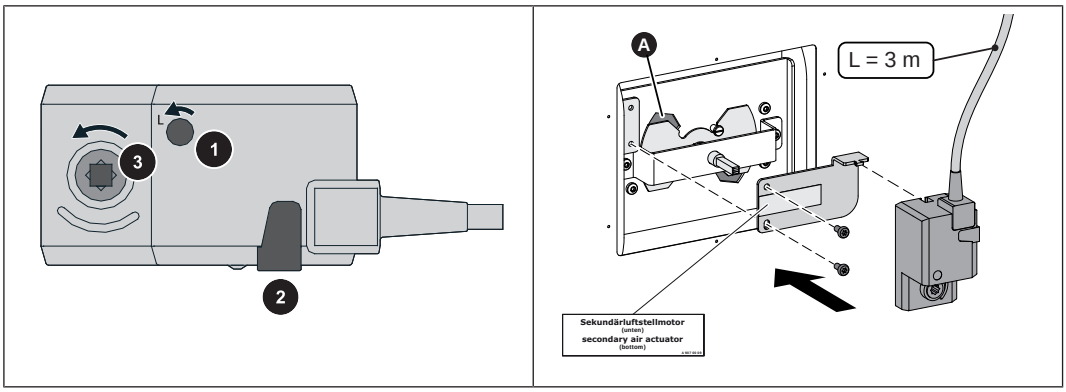
If an electrostatic particle separator is fitted



❒ Remove the cover plate from the back panel
- 6x M5 x 10 lens-head screws

❒ Insert the supplied insulating panel and fit the controller box to the back panel
- 4x M5 x 10 lens-head screws including contact washers

6.5.3 Fitting the air control



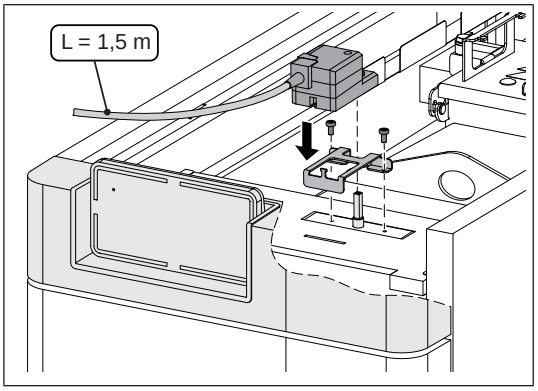
❒ Set the direction of rotation of the two servo-motors (1) to anti-clockwise (L)

❒ Press the unlock key (2) and turn the mounting for the shaft (3) anticlockwise as far as the stop

❒ Turn the sliding valve for secondary air at the rear of the boiler anticlockwise as far as the stop
IMPORTANT! The air opening (A) must be visible when the slider is at the left stop.

❒ Stick "Secondary air servo-motor" sticker on torque support

❒ Plug the servo-motor for secondary air (cable length 3 m) on to the shaft and secure with torque support
- 2x M5 x 10 lens-head screws

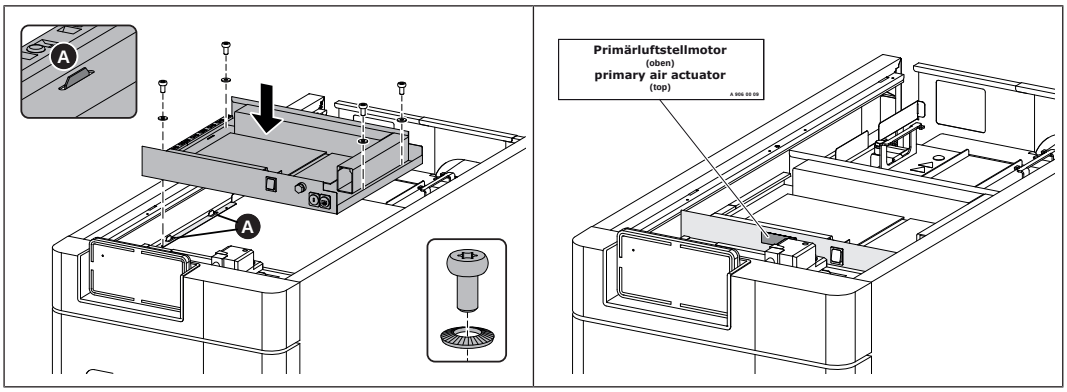


❒ Turn the sliding valve for primary air on the top of the boiler to the left (anti-clockwise) as far as the stop

❒ Plug the servo-motor for primary air (cable length 1.5 m) on to the shaft and secure with torque support
- 2x M5 x 10 lens-head screws

6.5.4 Fitting the controller box

S5 Turbo 22-30

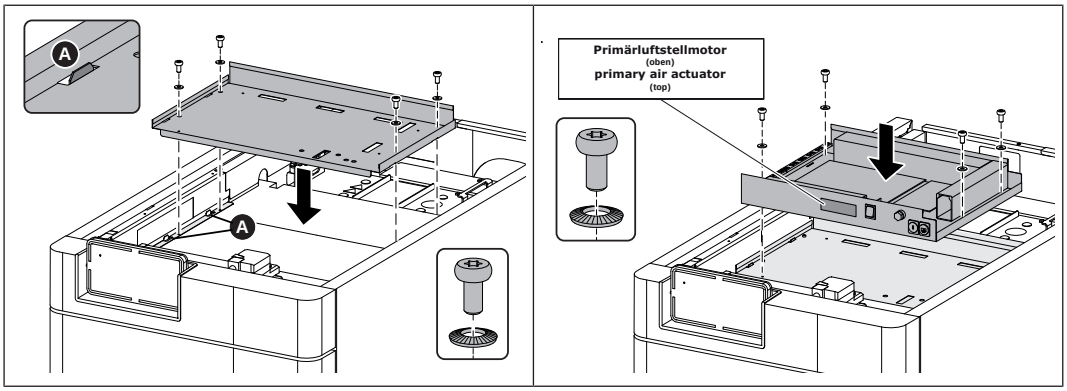


❒ Mount the control box on the boiler
- 4x M5 x 10 lens-head screws including contact washers

↳ Thread the tabs (A) into the cut-outs on the controller box

❒ Stick the "Primary air actuator" sticker on the controller box

S5 Turbo 32-48



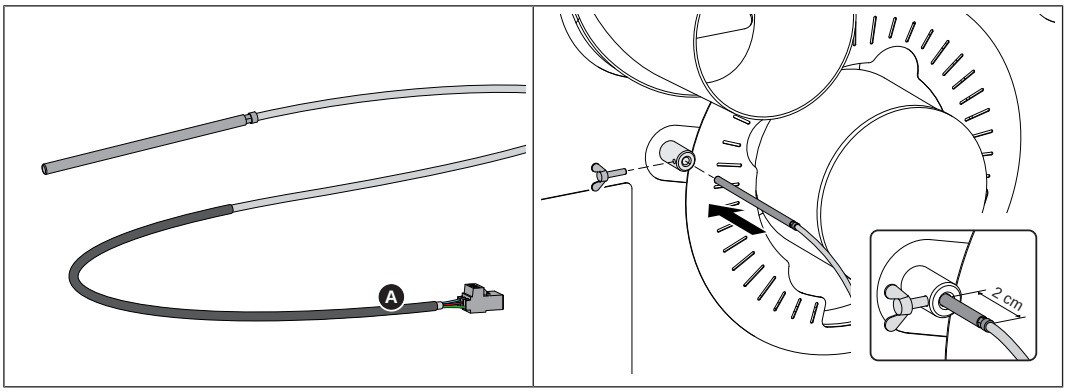
❒ Fitting the adapter plate for the controller box
- 4x M5 x 10 lens-head screws including contact washers

↳ Thread the tabs (A) into the cut-outs on the adapter plate

❒ Mount the control box on the adapter plate
- 4x M5 x 10 lens-head screws including contact washers

❒ Stick the "Primary air actuator" sticker on the controller box

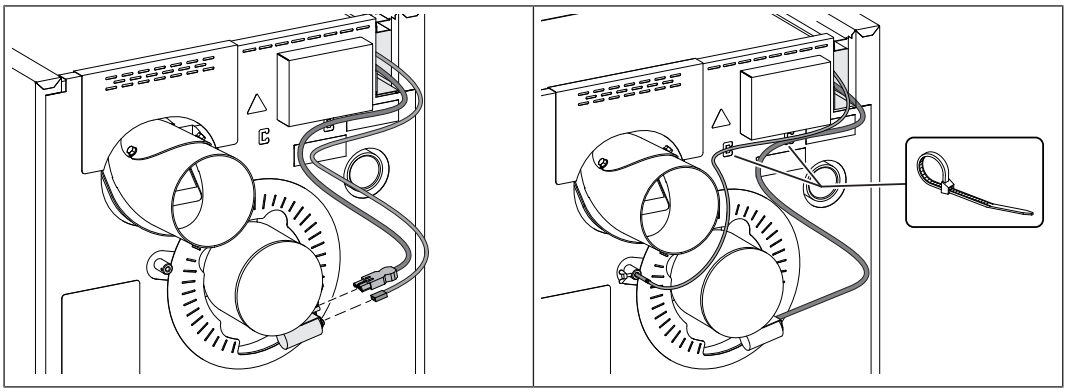
6.5.5 Mount the sensor and thermal discharge valve



❒ Push the protective tube (A) of the flue gas temperature sensor on to the plug of the cable

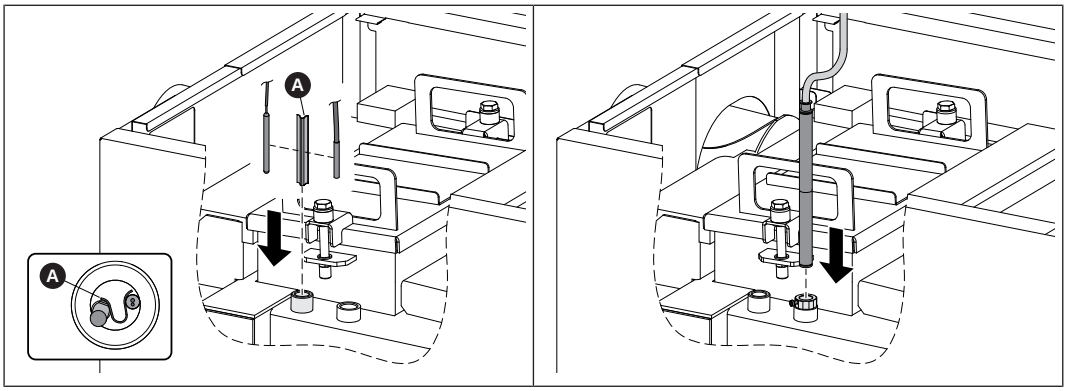
↳ The protective hose (A) serves as insulation within the boiler controller

❒ Insert the flue gas temperature sensor into the sleeve on the back panel, pull out approx. 2 cm and secure it in position with the wing screw



❒ Connecting the induced draught fan cable

❒ Secure the cable for flue gas temperature sensor and the induced draught fan to the strain reliefs using cable ties and route to the boiler controller



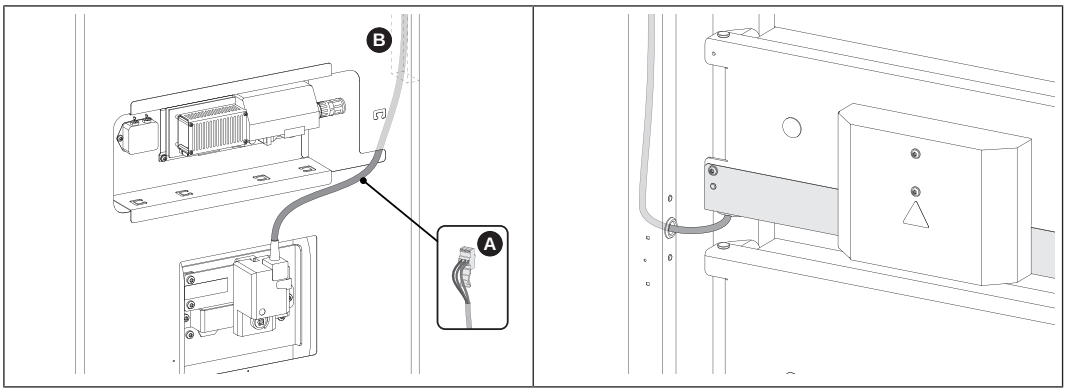
❒ Route the STL capillary from the boiler controller to the rear immersion sleeve

❒ Push the boiler temperature sensor and the STL capillary and compression spring (A) into the rear immersion sleeve

❒ Route the boiler temperature sensor cable to the boiler controller

❒ Slide the sensor and metal hose insulation into the immersion sleeve and secure with slotted screw

IMPORTANT! Thermal discharge valve not included in the scope of supply

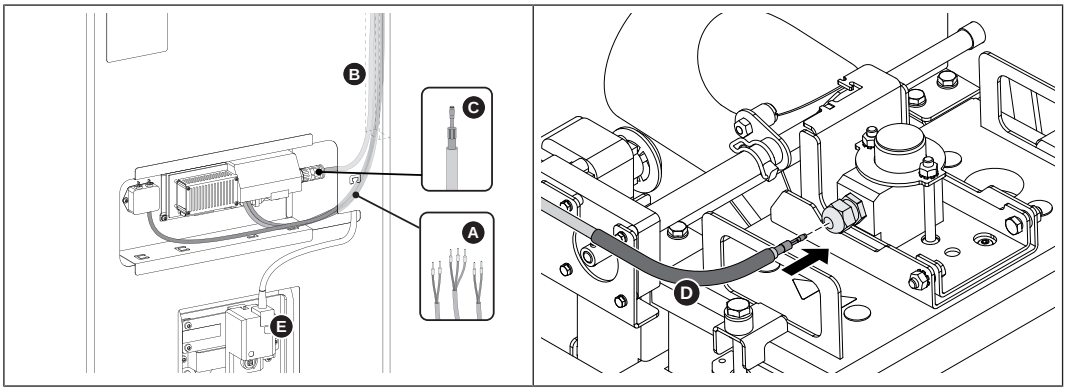


❒ Lay the cable for the secondary air servo-motor (A) via the cable duct (B - behind the back panel) to the boiler controller

For automatic ignition:

❒ Lay the supply cable for the glow igniter via the cable duct on the stop side of the door upwards to the boiler controller

If an electrostatic particle separator is fitted



❒ Route the cable (A) of the controller box via the cable duct (B - behind the back panel) to the boiler controller

↳ Operating signal (2-core)

↳ Enabling signal (2-core)

↳ Power supply (3-core)

❒ Lay and connect the HV cable (C) via the cable duct (B – behind the back panel) to the electrode unit on the heat exchanger cover

↳ The connector must click perceptibly into place

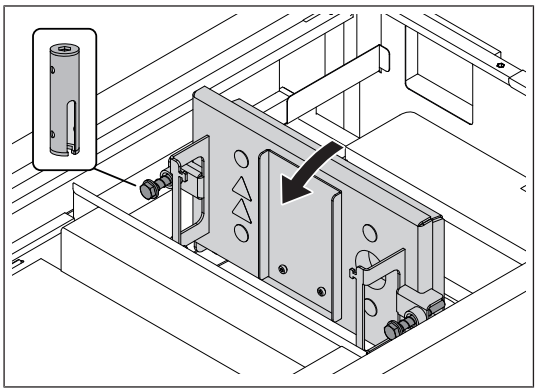
↳ Place the protective hose (D) near the electrode unit

❒ Use cable ties to secure the cable in the intended position

TIP: Use insulating tape to bundle together the supply cable (A), HV cable (C) and the cable of the secondary air servo-motor (E) and run them together via the cable duct upwards to the boiler controller

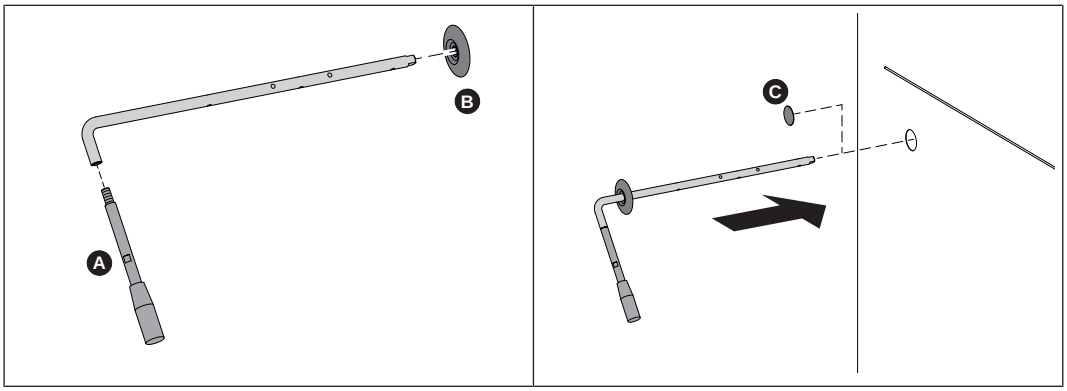
6.5.6 Fitting the WOS lever (for manual WOS)

The WOS lever can be mounted either on the left or right side of the boiler.



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

WOS lever on the left

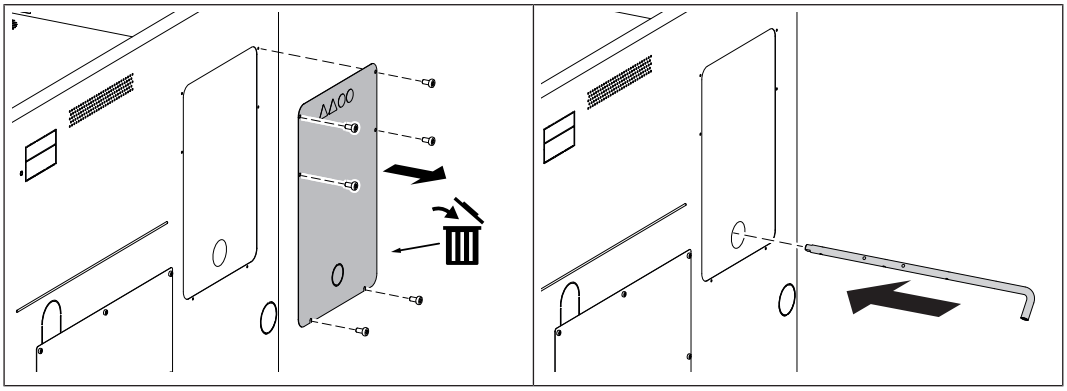


❒ Unscrew the handle (A) from the WOS shaft and slide the plastic cover (B) on

❒ Push out the round pre-punched blank on the side panel and remove the burrs using a half-round file

❒ Insert the WOS shaft into the heat exchanger from the left

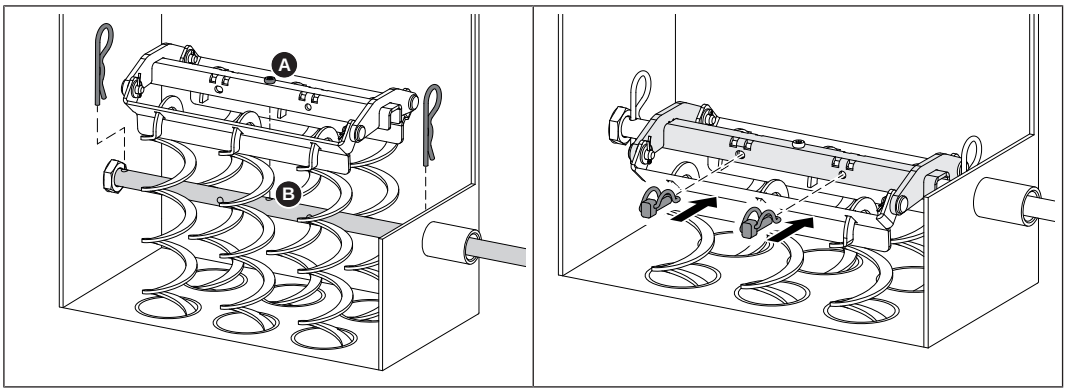
WOS lever on the right



❒ Remove the cover on the right-hand side panel
- 6x M5 x 10 lens-head screws

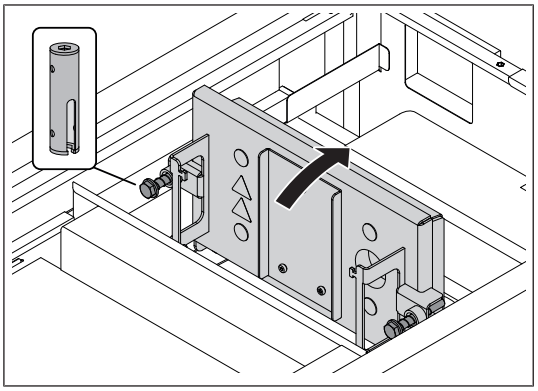
↳ The cover is no longer required

❒ Push the WOS shaft into the heat exchanger from the right



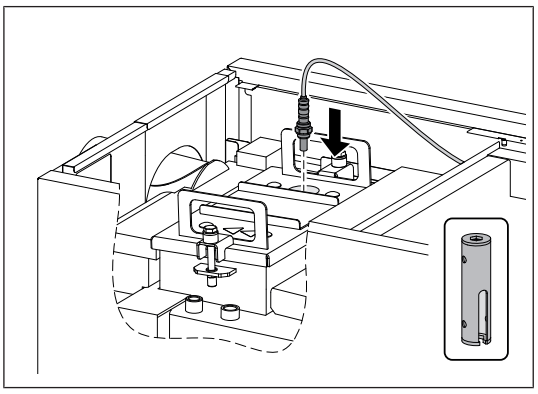
❒ Raise the WOS suspension links slightly, align the WOS lever and secure on both sides with Ø4 x 60 spring cotters

❒ Place the WOS suspension link on the WOS lever, inserting the screw (A) into the hole (B)



❒ Close the heat exchanger cover on the boiler and secure with screws

6.5.7 Installing the Lambda Probe

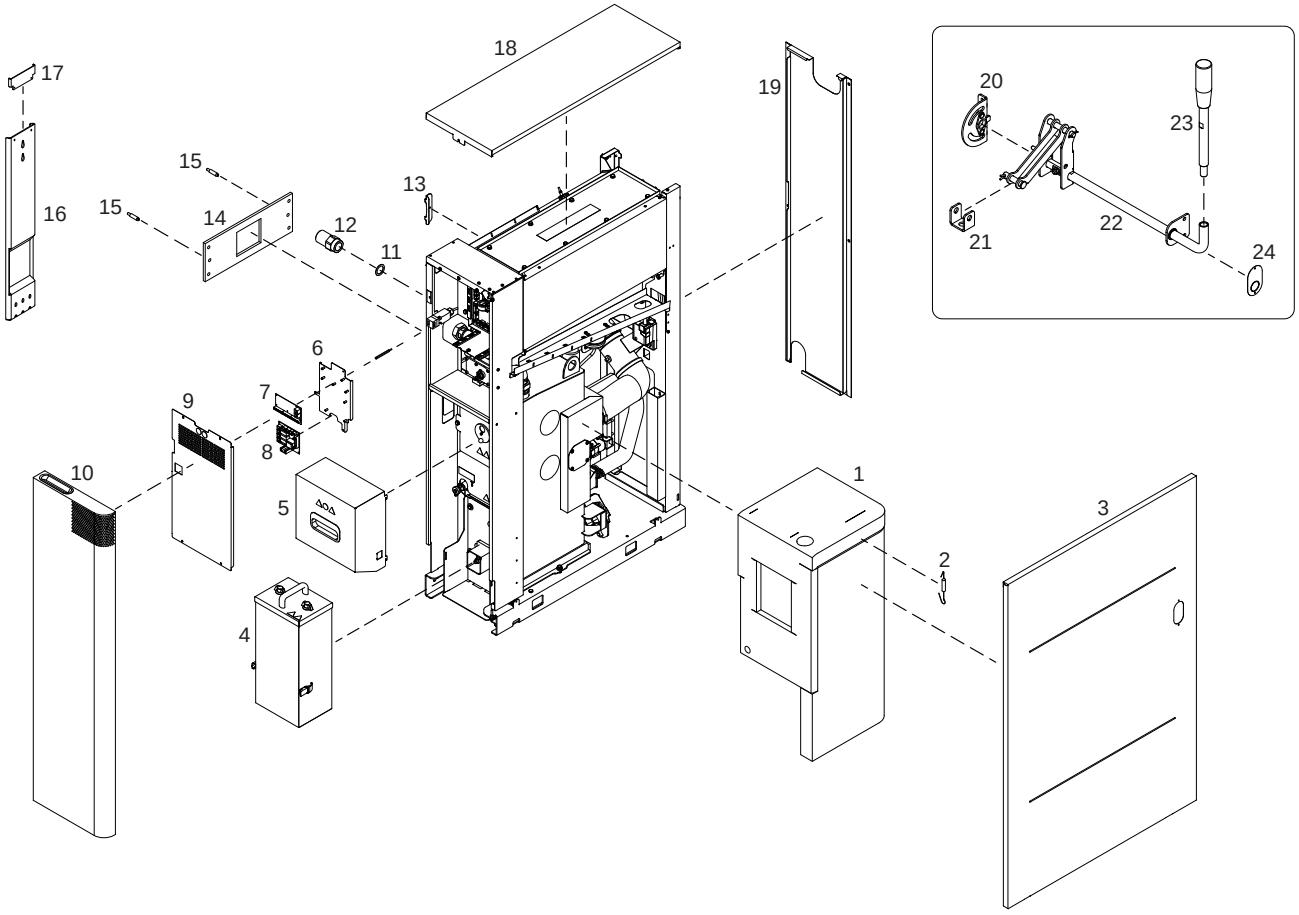


❒ Screw the Lambda probe into the heat exchanger cover and tighten using the supplied socket wrench

❒ Lay cable via cable duct to the boiler controller

6.6 Installing the pellet unit

6.6.1 Parts overview pellet unit

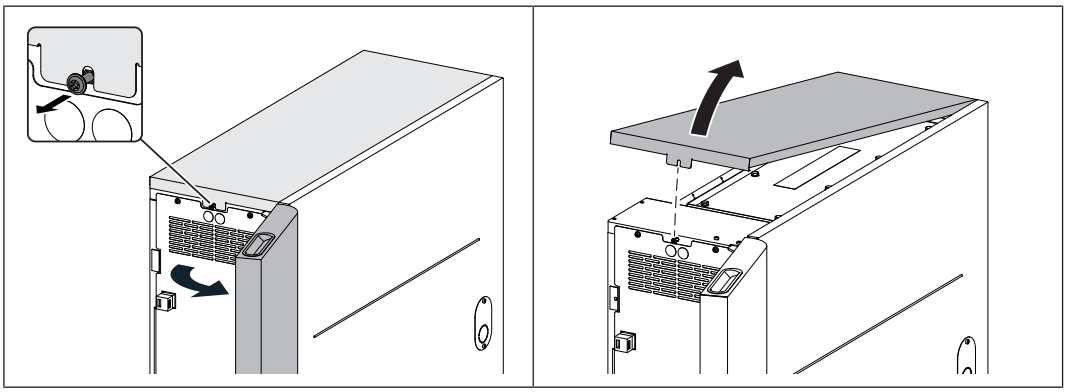


Item	Designation	Item	Designation
1	Thermal insulation for the pellet unit	**13**	Mounting bracket for the intake flange
2	Tension springs	**14**	Flange seal (supplied under the cover of the pellet container)
3	Side panel	**15**	Lock bolt
4	Ash container	**16**	Linking plate with flange cutout
5	Combustion chamber cover	**17**	Extension of suspension plate for S5 Dual 32-48
6	Mounting plate for additional circuit boards incl. mounting material (supplied in ash container)	**18**	Cover
7	Digital module (optional)	**19**	Back panel
8	Pellet module expansion (optional)	**20** [1]	Bearing for the WOS shaft
9	Controller cover	**21** [1]	Connecting plate
10	Front door	**22** [1]	WOS shaft
11	Flat gasket 44 x 32 x 2	**23**	WOS lever (scope of delivery for S5 Turbo)
12	6/4“ double nipple	**24** [1]	Cover, heat exchanger lever

1. Optional with manual WOS Efficiency Optimisation System on the right-hand side of the boiler

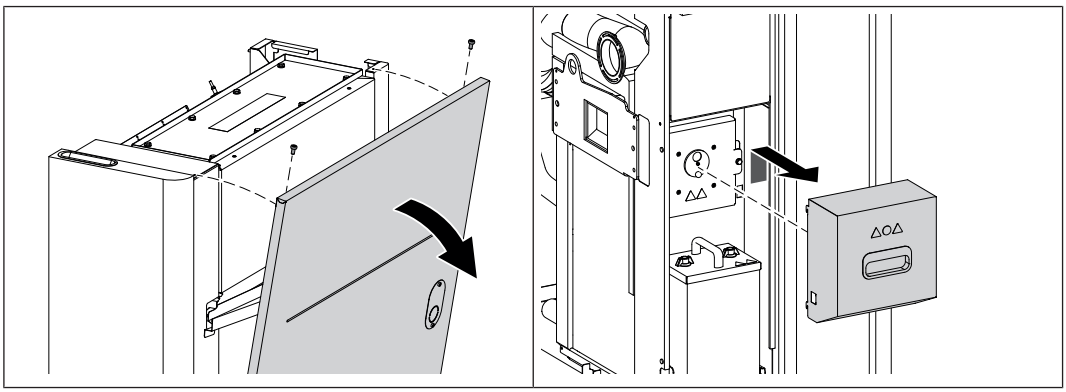
6.6.2 Remove the cladding from the pellet unit

Components removed in the following steps must be kept in a dry and dust-free protected location until they are refitted.



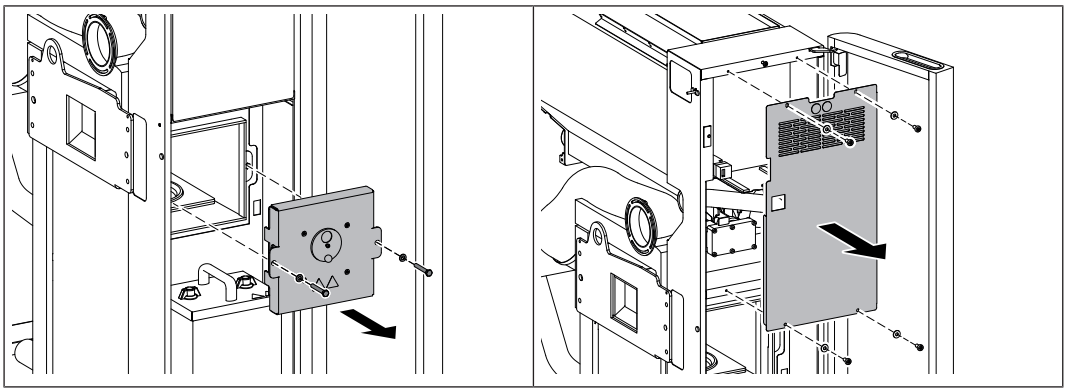
❒ Open the front door and loosen the retaining screw located behind it
- 1x M5 x 25 lens-head screw

❒ Lift the cover forward slightly and remove it towards the front



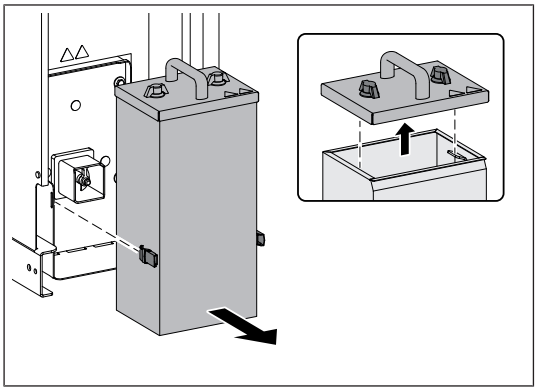
❒ Remove the side panel on the pellet unit
- 2x M5 x 10 lens-head screws

❒ Remove the cover of the combustion chamber cover forwards



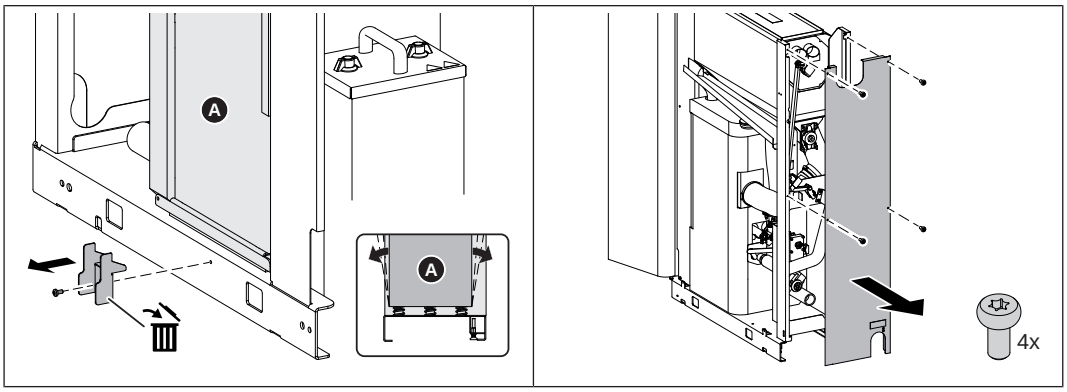
❒ Removing the combustion chamber cover
- 2x M8 x 55 hexagon head screws

❒ Removing the controller cover of the pellet unit
- 4x M5 x 10 lens-head screws including contact washers



❒ Open the insulated door and remove the ash container

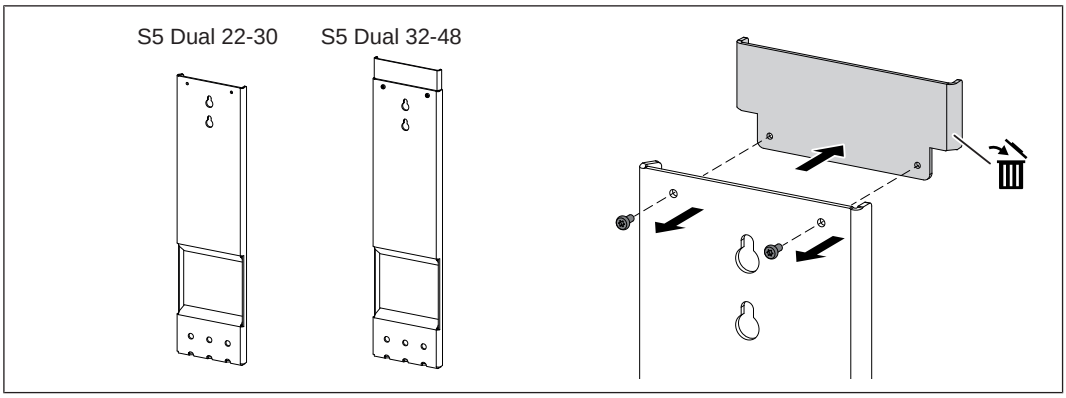
❒ Remove the cover of the ash container and take out the supplied accessories



❒ Remove the transport restraint from the base of the pellet unit
- 1x M6 x 12 lens-head screw
NOTE! The boiler body (A) of the pellet unit is mounted on compression springs to compensate for tolerances. The height of the boiler body can be easily adapted to the firewood boiler during subsequent installation.

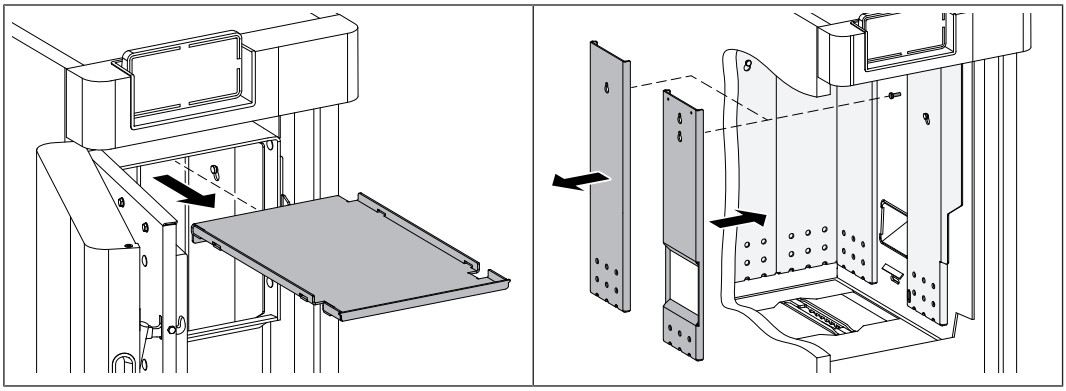
❒ Remove the back panel
- 4x M5 x 10 lens-head screws

6.6.3 Screw the pellet unit to the firewood boiler



❒ For S5 Dual 22-30:
Remove the extension on the mounting plate

↳ The extension is no longer required

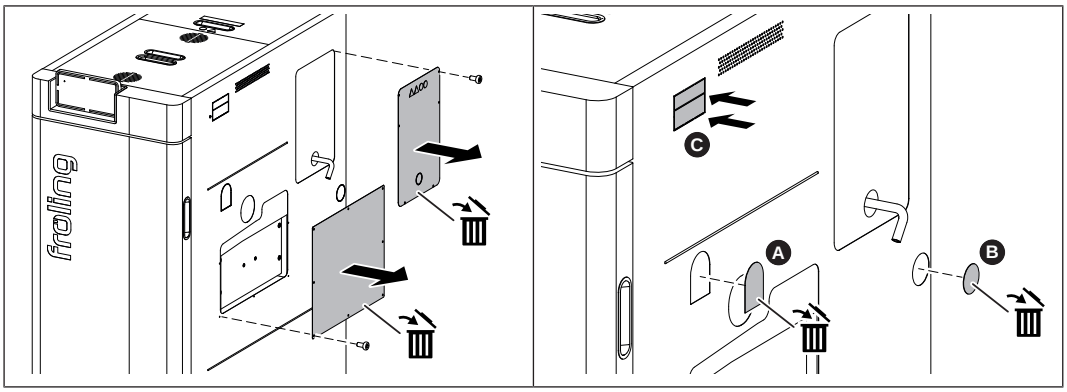


❒ Open the front door and fuel loading door

❒ Pull the upper protective plate out of the fuel loading chamber

❒ Unhook the centre mounting plate on the side of the pellet flange
TIP: Keep the suspension plate as a spare part

❒ Attach the suspension plate supplied with flange recess



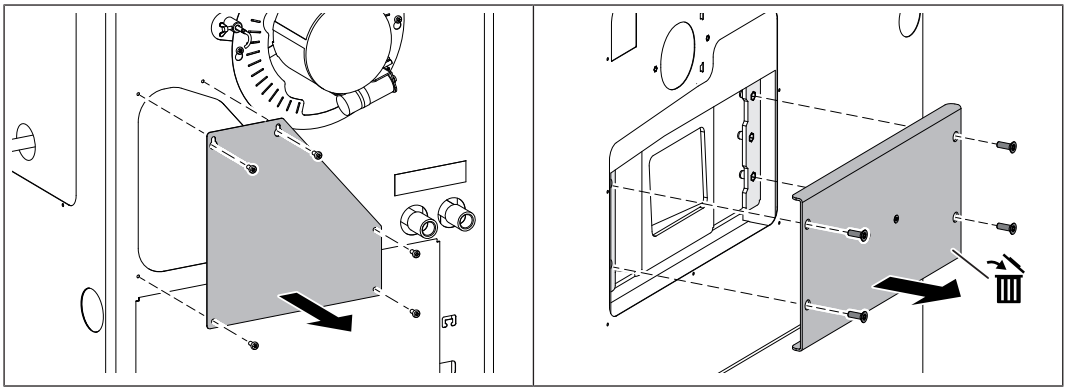
❒ Remove the covers on the right-hand side panel
- 14x M5 x 10 lens-head screws

↳ The covers are no longer required

❒ Remove the pre-punched blanks for the return line (A) and EGR hose (B) and remove burrs using a half-round file

↳ The pre-punched blanks are no longer required

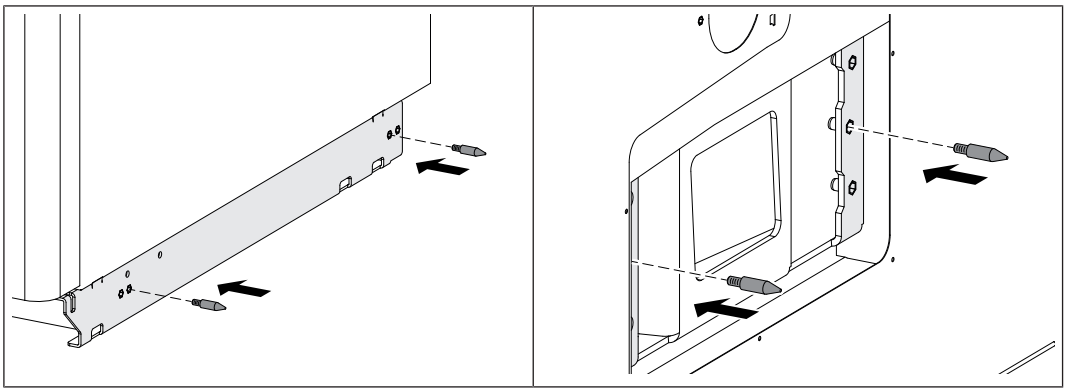
❒ Press in the pre-punched blank for the cable gland (C)



❒ Remove the blanking plate from the back panel
- 5x M5 x 10 lens-head screws

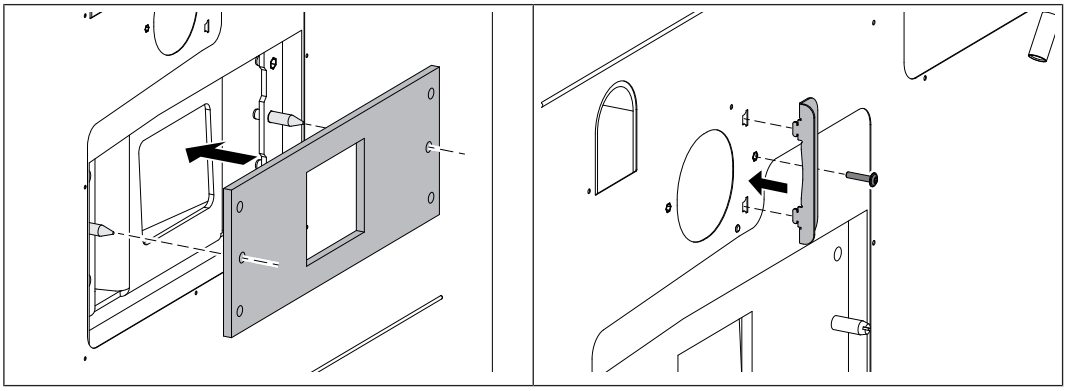
❒ Remove the blanking plate on the pellet flange

❒ The blanking plate is no longer required



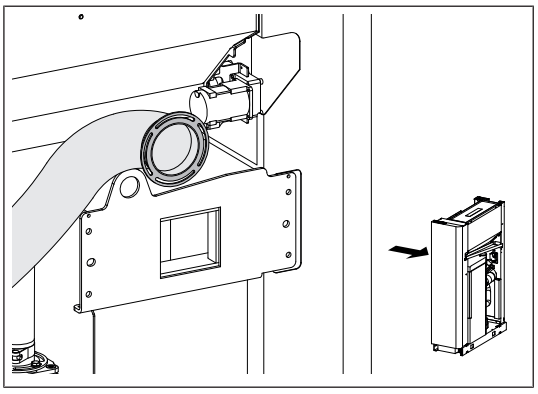
❒ Screw in two lock bolts at the inner screw positions on the boiler base

❒ Screw in two lock bolts into the centre screw positions on the pellet flange



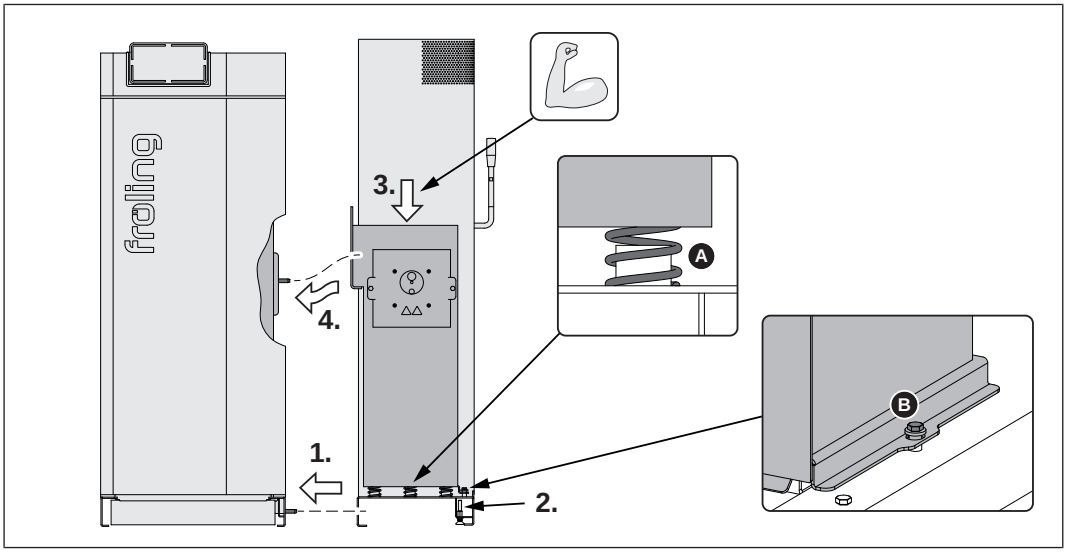
❒ Slide the flange seal over the lock bolts

❒ Thread the retaining brackets into the cut-outs in the side panel and secure them in place
- 1x M5 x 25 lens-head screw



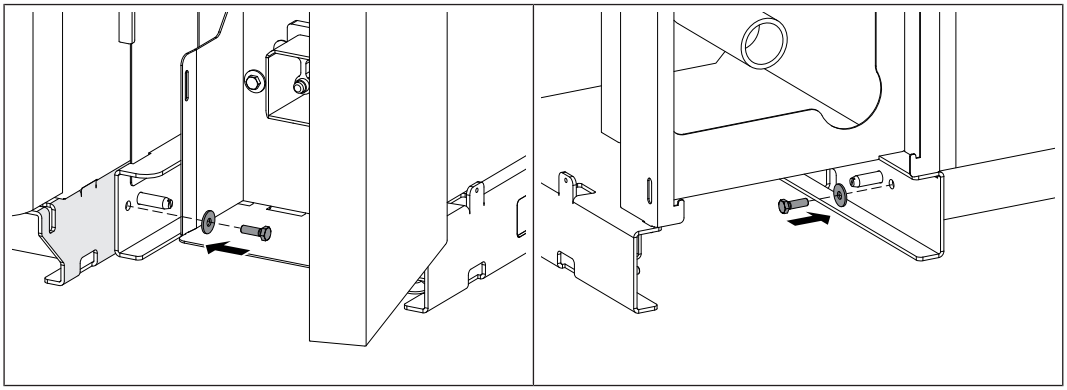
❒ Loosen the air hose and position it as shown

NOTE! The boiler body of the pellet unit is movably mounted on compression springs to compensate for tolerance.

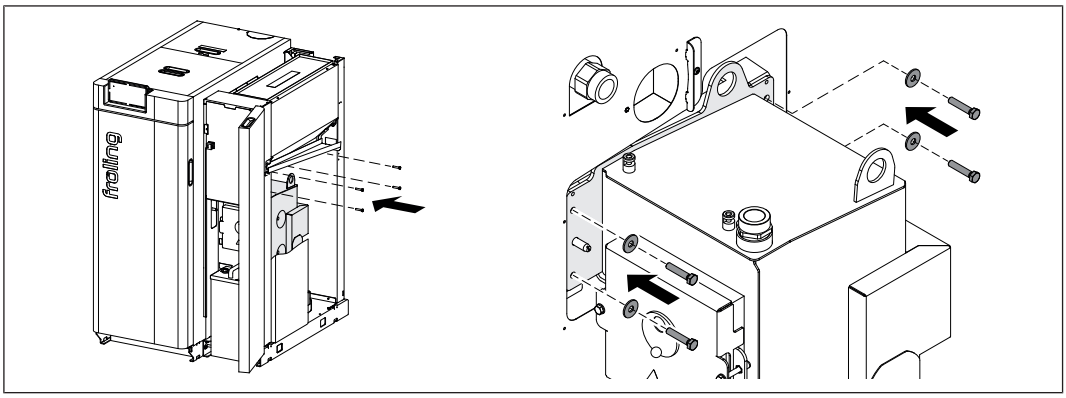


1. Slide the pellet unit on to the lock bolts on the boiler base
2. Align the pellet unit horizontally on the adjustable feet
3. Press the boiler body of the pellet unit down against the spring force (A) until the lock bolt on the pellet flange is aligned with the holes in the pellet unit
4. Slide the pellet unit on to the lock bolt on the pellet flange

IMPORTANT! The screws (B) on the boiler base serve as a stop - they are not adjustable

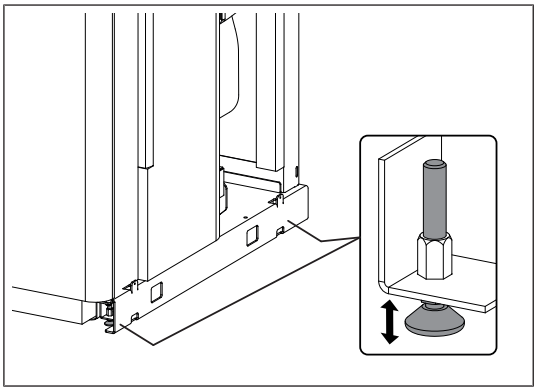


❒ Fix the base frame of the pellet unit to the front and rear of the firewood boiler - 2x M8 x 25 hexagon head screws

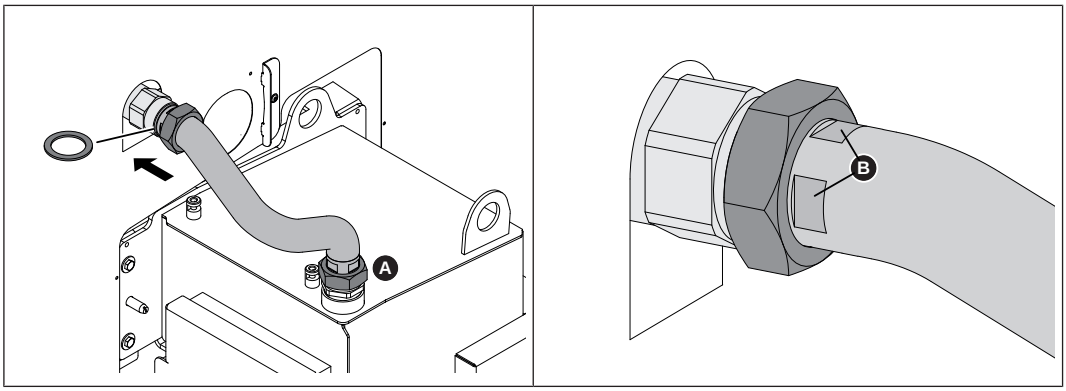


❒ Attach the pellet unit to the pellet flange of the firewood boiler
- 4x M8 x 40 hexagon head screws

↳ Tightening torque: 30 Nm



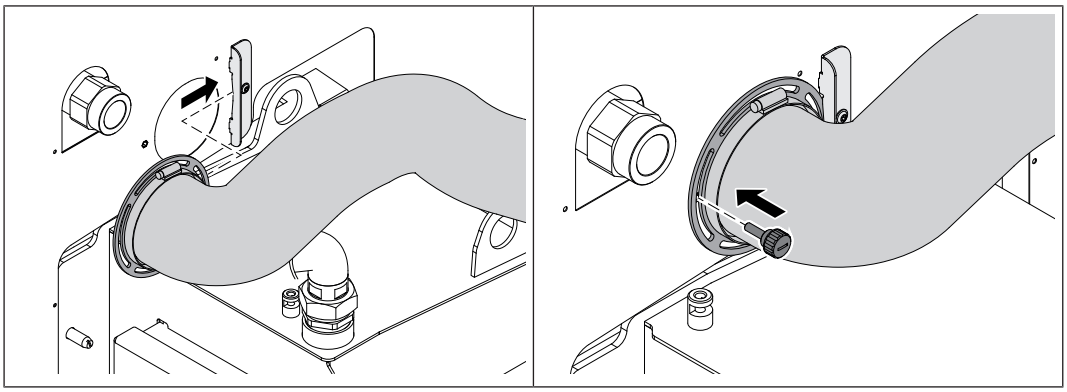
❒ Align the frame of the pellet unit parallel to the firewood boiler by adjusting the adjustable feet



❒ Screw the stainless steel corrugated hose on to the double nipple of the firewood boiler, using a flat gasket

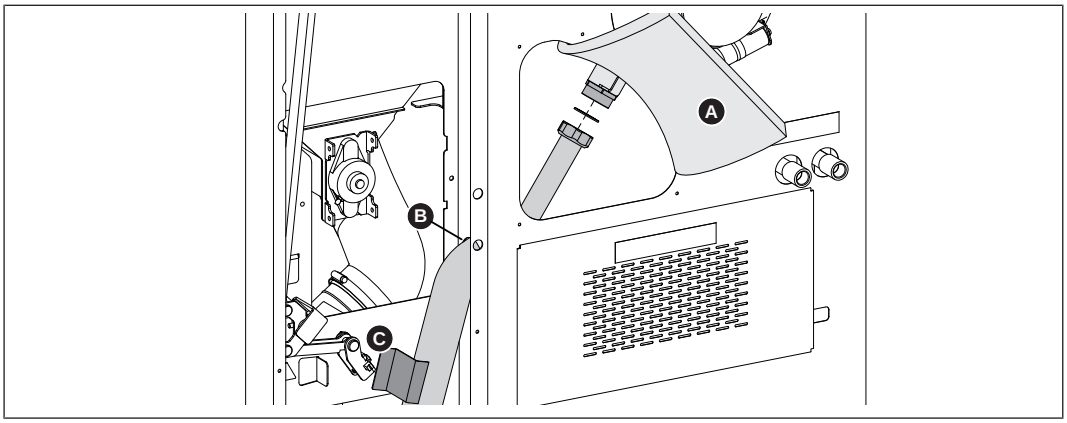
❒ Check the pre-assembled screw connection (A) for leaktightness

IMPORTANT! Hold it against the flats (B) when tightening the connections



❒ Insert the flange of the air hose into the cut-out in the retaining bracket

❒ Fix the flange with a knurled screw at the front
- 1x knurled screw M5 x 16



❒ Remove the thermal insulation (A) of the induced draught fan towards the rear

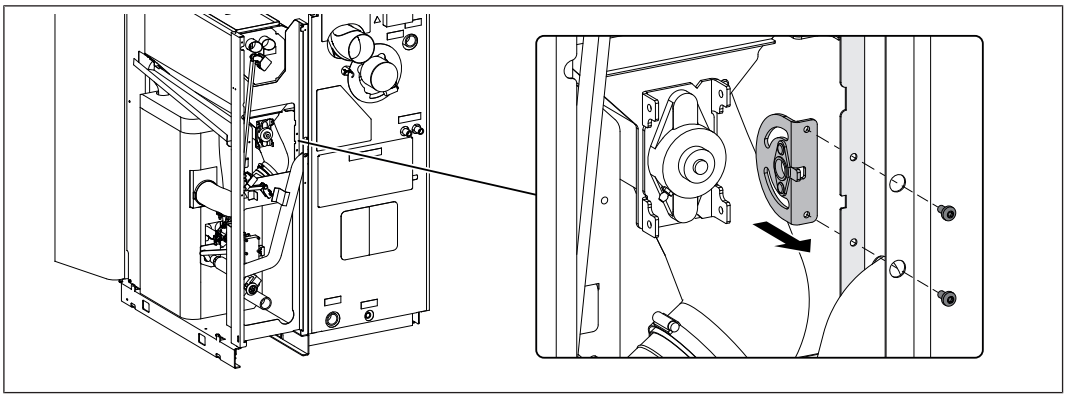
❒ Route the flue gas recirculation (FGR) hose via the side cut-out (B) to the induced draught housing

↳ TIP: Remove the securing plate (C) and then refit it

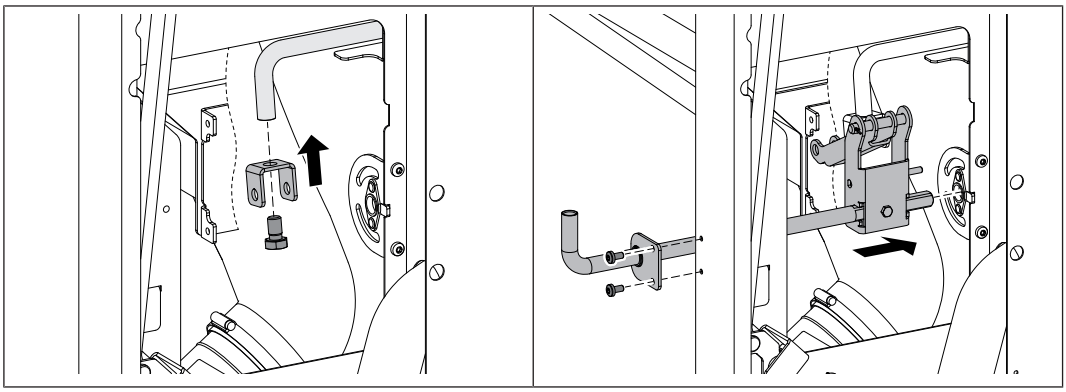
❒ Screw the FGR hose tightly to the intake manifold housing using a flat gasket

❒ Reinsert the thermal insulation (A)

6.6.4 Fit the WOS lever (for manual WOS on the right-hand side of the boiler)



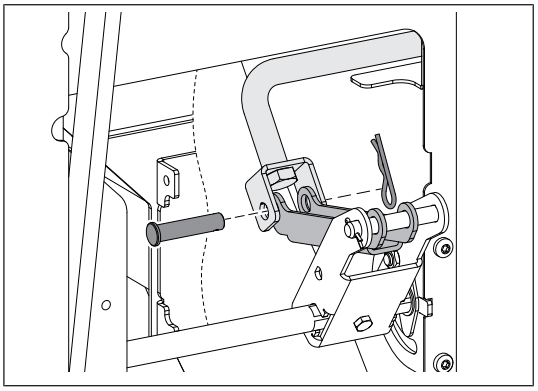
❒ Mount the bearing for the WOS shaft on the rear frame as shown
- 2x M6 x 12 lens-head screws



❒ Fitting the connecting plate to the WOS shaft of the firewood boiler
- 1x M12 x 20 hexagon head screw

❒ Slide the WOS shaft into the bearing and fix it to the side of the frame
- 2x M6 x 12 lens-head screws

↳ Watch out for the servo-motor cable
If required, thread the WOS shaft in from the rear

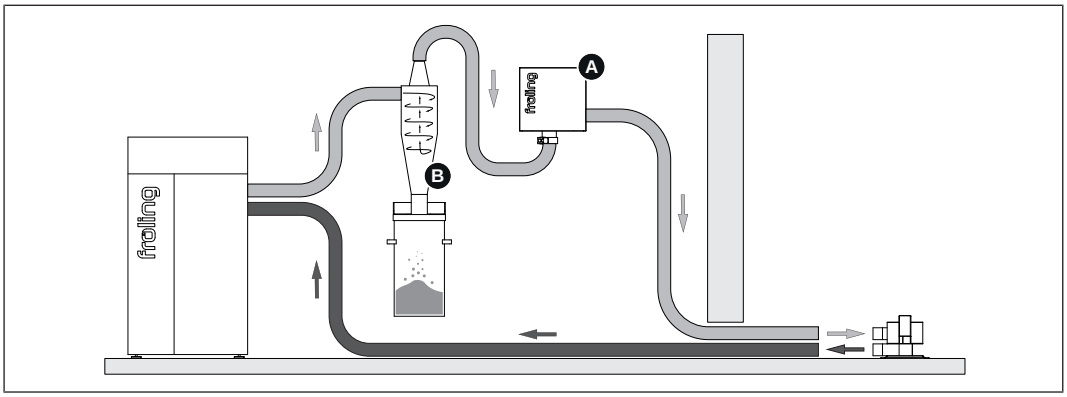


❒ Fit the driver lever on to the connecting plate
- Split pin Ø10 x 45 incl. spring cotter

6.7 Connecting the discharge system

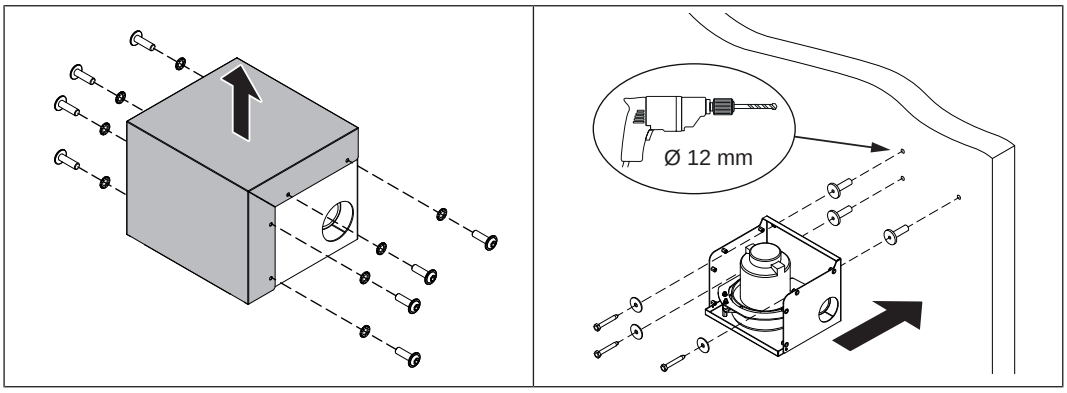
6.7.1 Installing the external suction module

The pellets are loaded using an external suction module built into the return air line between the boiler and the suction point.



When installing the device, note the following points:

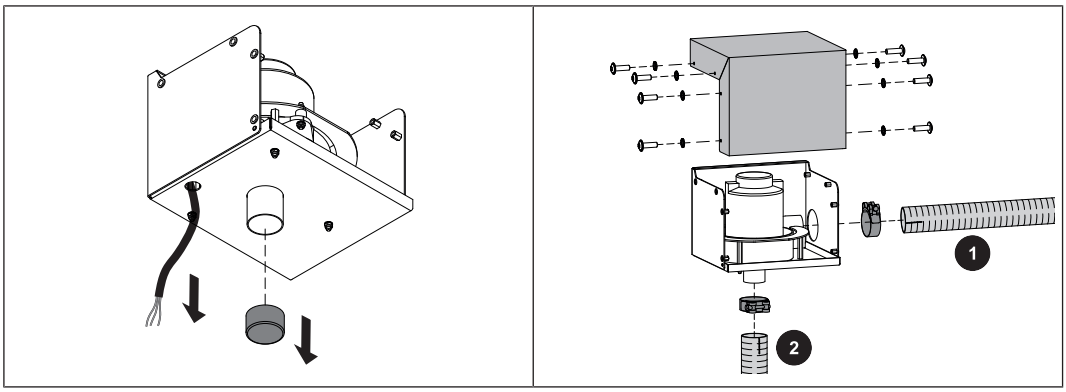
- The position of the external suction module (A) in the return air line is freely selectable.
  When using a pellet dust extractor PST (B), install the external suction module between the pellet dust extractor and the fuel store.
- Before starting installation, ensure the installation materials are suitable. Where required, replace by material suitable for the base.
- No specific installation position is required for the suction turbine to operate smoothly. Preferably, the suction module should be installed so that existing openings in the housing are not on the upper side and the suction turbine is protected against external influences.
- Do not switch on the power supply or start up the device until the hose lines have been connected



❒ Undo the screws on the suction module and remove the cover hood

❒ Install the bottom panel including the supplied dowels and screws at any desired position in the return air line

↳ If the suction module is positioned at a maximum distance of 2 m to the boiler, the power supply line can be plugged in as is. When distances are greater the power supply line must be lengthened accordingly on-site



❒ Run the cable for the suction turbine through the opening on the bottom and remove the protective cap

❒ Fix the hose lines to the connections using hose clamps

↳ Return air line (1) from the suction module to the extraction point

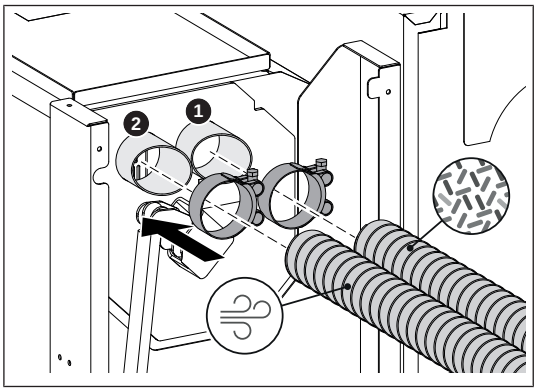
↳ Return air line (2) from the boiler to the suction module

↳ **IMPORTANT! Whilst doing this, ensure potential equalisation is maintained,** ➲ "Assembly information for hose lines" [▸ 82]

❒ Install the cover hood on the suction module

6.7.2 Install suction hoses

After installing the discharge system in accordance with the included installation manual, connect the suction and return air lines to the pellet unit.

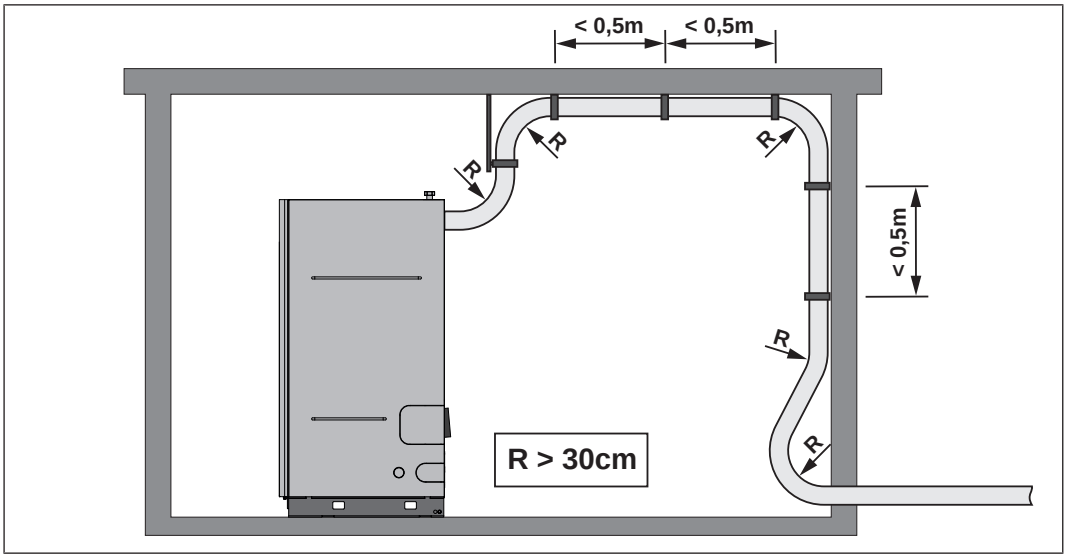


❒ Secure the pellet suction hose to the right-hand connection (1) with a hinge pin clamp (sticker "Pellets")

❒ Fix the return air line to the left-hand connection (2) with a hinge pin clamp

IMPORTANT! When connecting the hose lines, ensure the equipotential bonding is made in accordance with the installation instructions for the discharge system, ➲ "Potential equalisation" [▸ 83]

6.7.3 Assembly information for hose lines

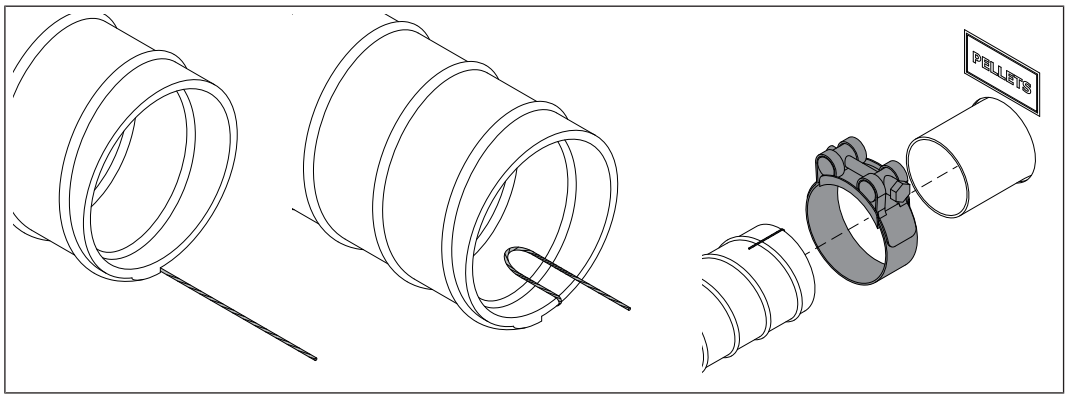


Please note the following:

- Do not kink the hose lines! Minimum bending radius = 30cm
- Lay the hose lines as straight as possible. Sagging lines can lead to “pockets”, which may mean fault-free feeding of pellets can no longer be relied on
- Lay the hose lines in short sections and route them so they do not pose a trip hazard
- Hose lines are not UV-proof. Therefore: Do not install the hose lines outdoors
- Hose lines are suitable for temperatures up to 60°C. Therefore: Hose lines must not come into contact with flue gas pipes or uninsulated heating pipes
- Hose lines must be earthed at both ends to ensure that no static charge builds up as a result of transporting the pellets
- If possible, make both the suction hose and return air line of single pieces of material. If due to the design of the system the hose line has to consist of several sections, ensure continuity of potential equalisation. Only components available from Froling GesmbH may be used to make connections in the hose line
- For systems rated at more than 35 kW, to cater for the increased stress only hose lines with PU inlets should be used

Potential equalisation

IMPORTANT! Ensure consistent potential equalisation when connecting the hose lines!



❒ Expose the earth wire of the hose line to approx. 8 cm

↳ **TIP:** Slit the insulation open along the wire with a knife

❒ Bend the earth wire inwards in a loop

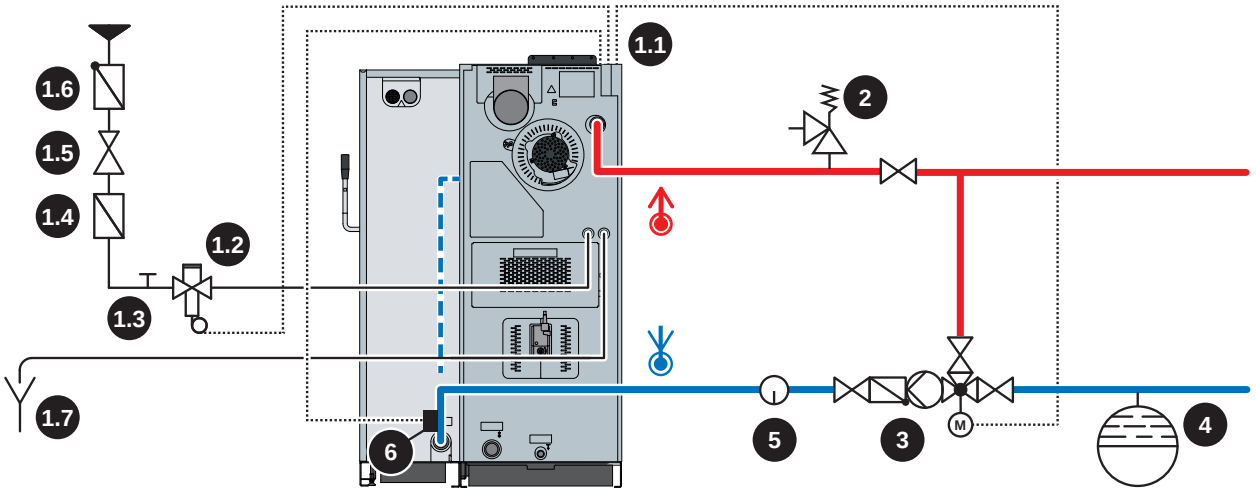
↳ This prevents the earth wire from being damaged by the pellet movement

❒ Slide the hose clamp onto the hose line and secure to connector

↳ Ensure that contact is established between the earth wire and the connector. Remove paint from the affected area if necessary

↳ **TIP:** If stiffness occurs when trying to attach the hoses to the connectors, pour a few drops of water onto the pipe (do not use lubrication grease!)

6.8 Hydraulic connection



1 Thermal discharge valve

- The thermal discharge safety device must be connected in accordance with ÖNORM/DIN EN 303-5 and as shown in the diagram above
- The discharge safety sensor must be connected to a pressurised cold water mains supply (temperature ≤ 15°C) in such a way that it cannot be shut off
- If the cold water pressure is ≥ 6 bar, a pressure reducing valve (1.5) is required
  Minimum cold water pressure = 2 bar

1.1 Sensor for the thermal discharge valve
1.2 Thermal discharge valve (opens at approx. 95°C)
1.3 Cleaning valve (T-piece)
1.4 Dirt trap
1.5 Pressure reducing valve
1.6 Backflow preventer to prevent stagnation of water in the drinking water network
1.7 Free outlet without back pressure with observable flow path (e.g. discharge funnel)

2 Safety valve

- Requirements for safety valves as specified by DIN EN ISO 4126-1
- Minimum diameter for the inlet to the safety valve as specified by EN 12828:
  DN15 (≤ 50 kW), DN20 (> 50 to ≤ 100 kW), DN25 (> 100 to ≤ 200 kW), DN32 (> 200 to ≤ 300 kW), DN40 (> 300 to ≤ 600 kW), DN50 (> 600 to ≤ 900 kW)
- Maximum pressure setting in terms of the permissible operating pressure of the boiler, see the section “Technical Data”
- The safety valve must be installed in an accessible place on the boiler or in direct proximity in the flow pipe in such a way that it cannot be shut off
- Unhindered and safe escape of the steam or water that is released must be ensured

3 Return temperature control

4 Diaphragm expansion tank

- The diaphragm pressurised expansion tank must conform to EN 13831 and hold at least the maximum expansion volume of the heated water in the system, including a water seal
- Its size must comply with the design information in EN 12828 - Appendix D
- Ideally it should be installed in the return line. Follow the manufacturer’s installation instructions

5 We recommend installing some sort of monitoring device (such as a thermometer)

6 Internal pipe union from the pellet unit outfeed to the firewood boiler return

- Return feed sensor already pre-installed on the return pipe of the pellet unit

6.9 Electrical connection

⚠ DANGER

When working on electrical components:

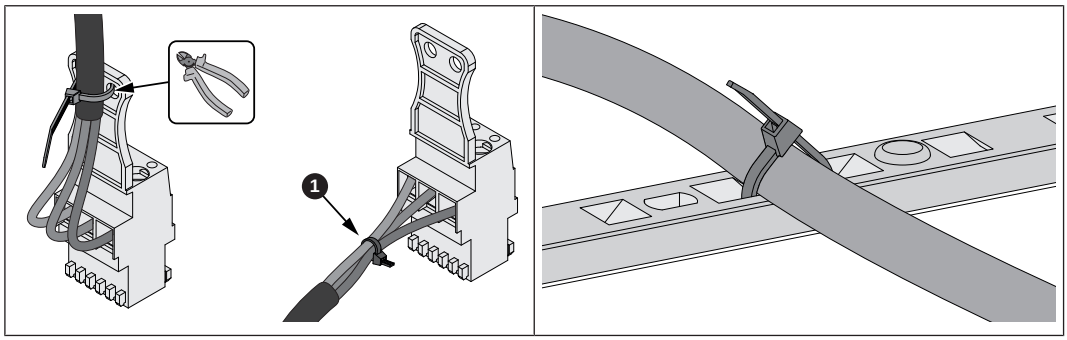
Risk of electrocution!

When work is carried out on electrical components:

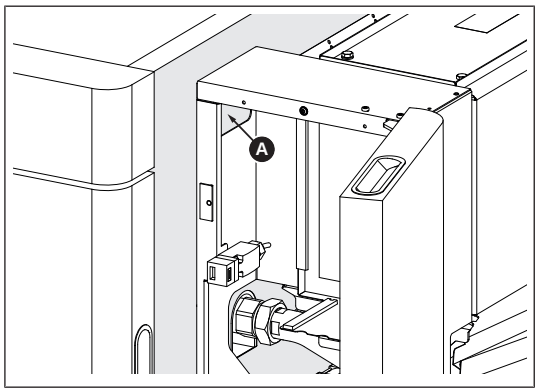
- ❒ Always have work carried out by a qualified electrician
- ❒ Observe the applicable standards and regulations
  - ↳ Work must not be carried out on electrical components by unauthorised persons

Prepare the plug

some components come ready to connect with the cable fixed to the tag connector with cable tie.

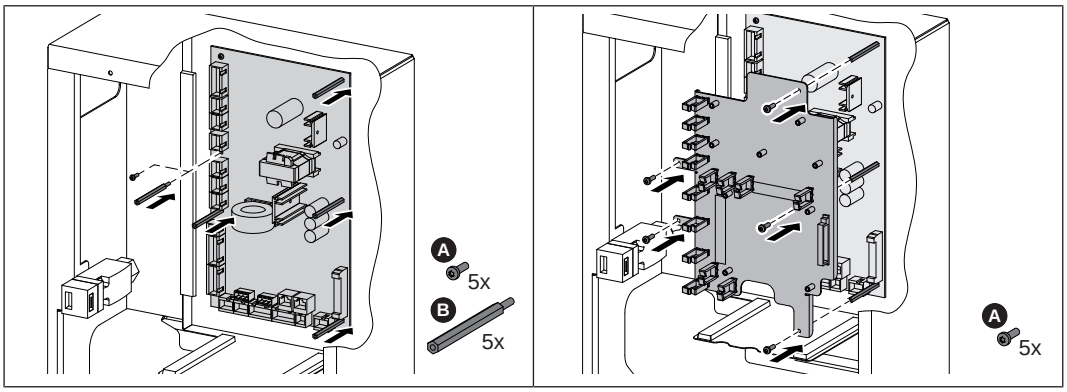


- ❒ Remove the cable ties from the tag connector
- ❒ Bind the individual cores together with cable ties (1)
- ❒ Attach cables and cable ties to the strain reliefs on the boiler



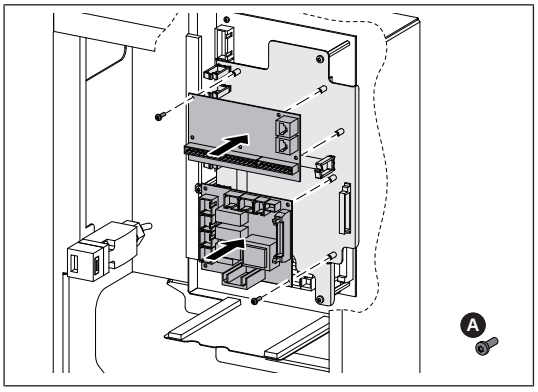
- ❒ Feed the following cables through opening (A) in the side panel to the boiler controller
  - ↳ Lock (KM12)
  - ↳ Bus connection (KM02, HY0.03), ➲ "Bus connection to pellet unit" [▸ 107]
  - ↳ Return feed sensor (KM17)
  - ↳ Temperature sensor of the pellet unit (KM18)
  - ↳ Ignition of the pellet unit (KM34)
  - ↳ Pellet unit power supply, ➲ "Pellet unit power supply" [▸ 108]

When using additional circuit boards



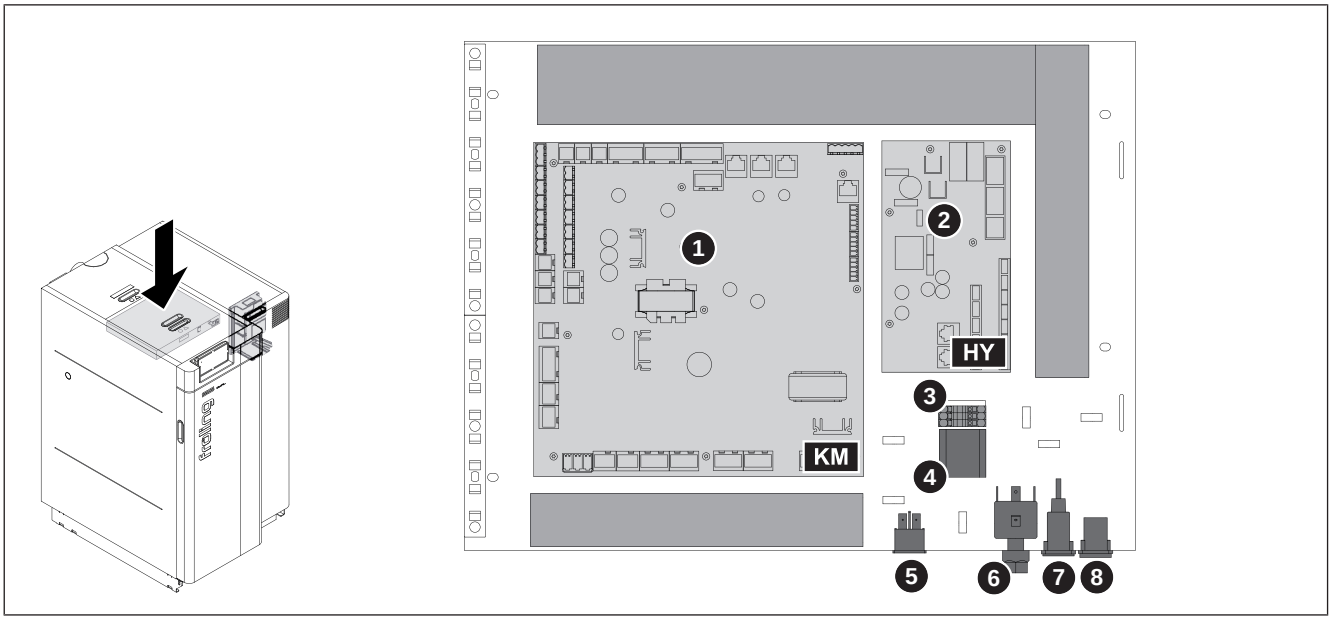
❒ Remove five lens-head screws M3 x 10 (A) at the positions shown and fit five spacer pins (B) instead

❒ Fit the supplied PCB carrier to the spacer pins
- 5x M3 x 10 lens-head screws (A)

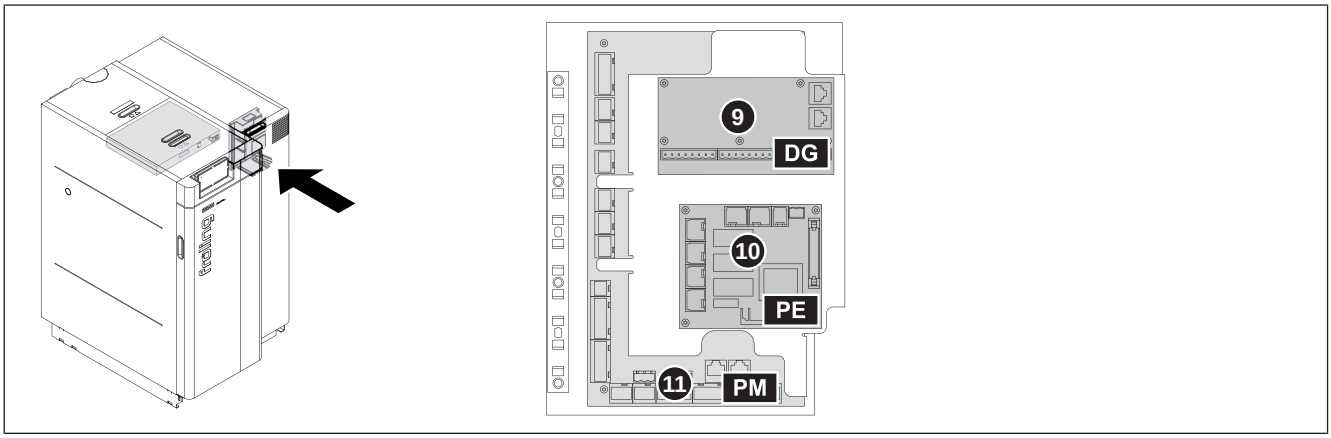


❒ Mount the digital module and pellet module extension (depending on the version) on the PCB carrier
- M3 x 10 lens-head screw (A)

6.9.1 Board overview

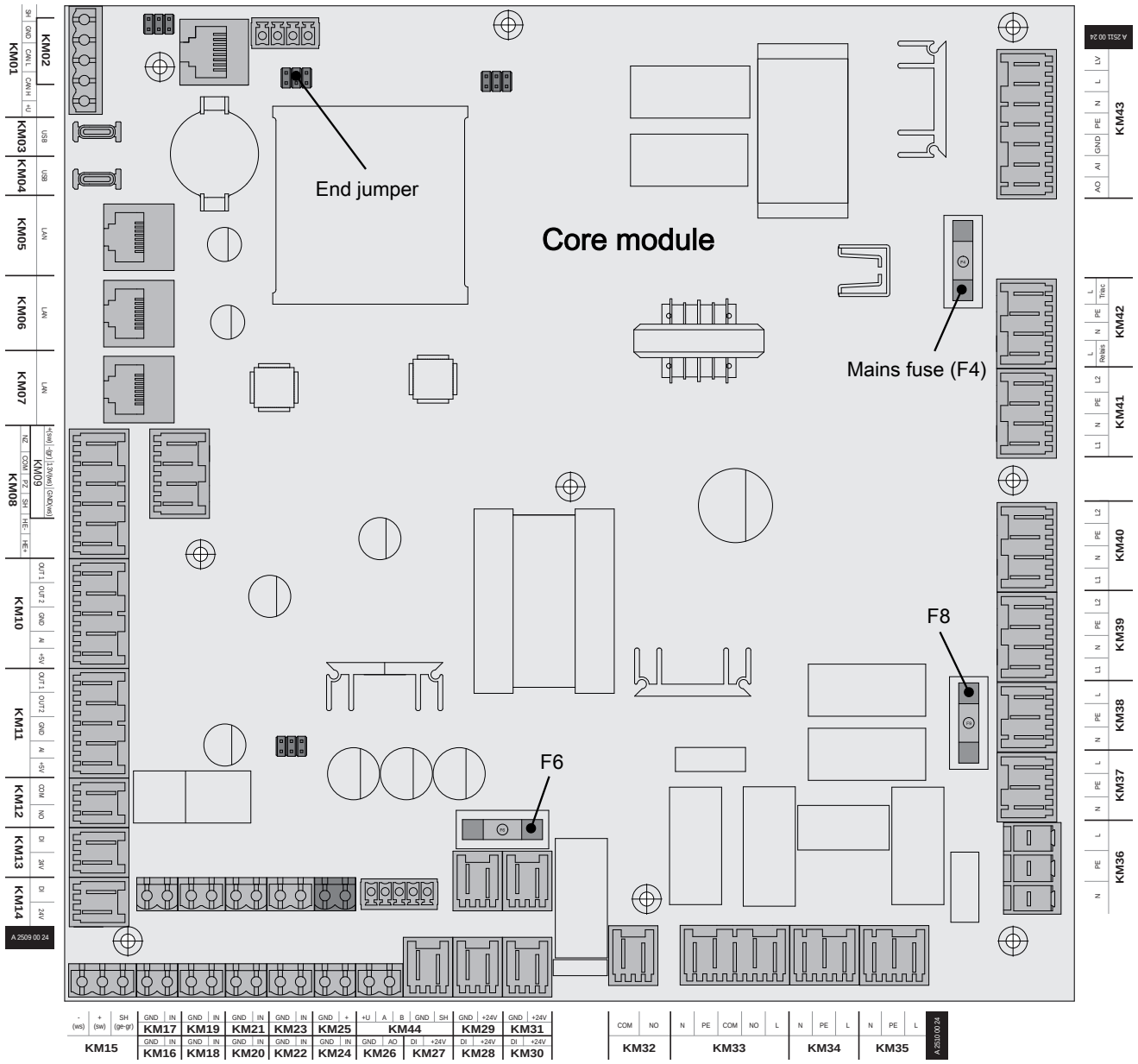


Item	Designation	Item	Designation
1	Core module	**5**	Main switch
2	Hydraulic module	**6**	High-limit thermostat STL
3	Terminal blocks for mains connection	**7**	Service interface USB-C
4	Device connection terminal	**8**	Service interface RJ45



Item	Designation	Item	Designation
9	Digital module (optional)	**11**	Pellet module
10	Pellet module expansion (optional)		

6.9.2 Core module



Core module		Standard assignment	Connection used for
KM01	Bus (LIYCY 2x2x0.5)	External bus module	
KM02	Connection to pellet module		
KM03	USB C	Data logging	
KM04	Service interface		
KM05	LAN (RJ45), DHCP-Client[1)]	Connect / room console(s)	
KM06	Boiler display		
KM07	LAN (RJ45), DHCP-Server[2)]	Service / room console(s)	
KM08	Broadband Lambda probe BOSCH, NTK		
KM09	Lambda probe NTK		
KM10	Secondary air damper		
KM11	Primary air flap		
KM12	Lock		

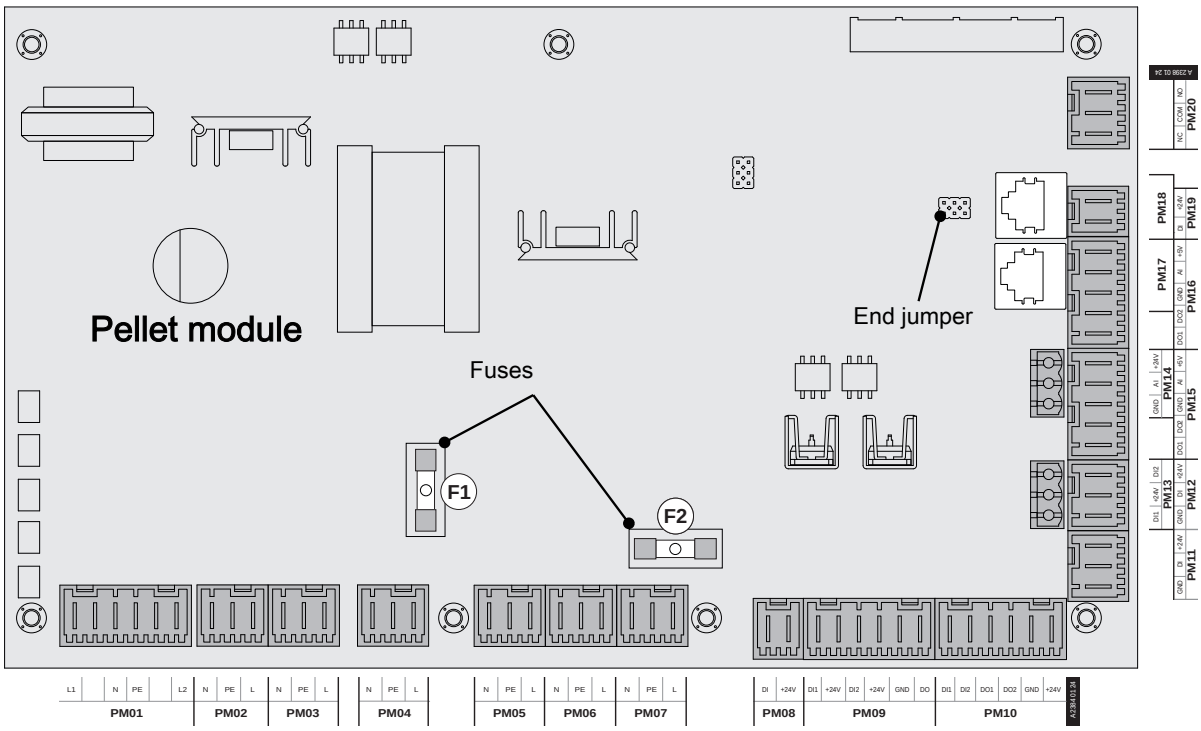
Core module		Standard assignment	Connection used for
KM13	STL		
KM14	Digital input 24V	EMERGENCY STOP	
KM15	Flue gas temperature sensor		
KM16	Boiler sensor		
KM17	Return feed sensor		
KM18	Pellet unit temperature sensor		
KM19	KTY, NTC, PT1000[3)]	-	
KM20	KTY, NTC, PT1000[3)]	Flow temperature sensor heating circuit 1	
KM21	KTY, NTC, PT1000[3)]	Analogue room temperature sensor Heating circuit 1	
KM22	KTY, NTC, PT1000[3)]	Flow temperature sensor heating circuit 2	
KM23	KTY, NTC, PT1000[3)]	Analogue room temperature sensor Heating circuit 2	
KM24	KTY, NTC, PT1000[3)]	Outside temperature sensor	
KM25	Digital input 5 V	Flow rate sensor	
KM26	PWM, 0-10V, max. 10 mA	Boiler pump signal (KM42)	
KM27	Digital input 24 V	Enable	
KM28	Firewood boiler door switch		
KM29	Power supply 24 VAC, max. 80 mA		
KM30	Monitoring the WOS		
KM31	Boiler controller power supply		
KM32	Potential-free switching contact, max. 230 V, max. 4 A	Enabling signal (br+bl) Electrostatic particle separator	
KM33	Supply 230 V; potential-free switching contact, max. 230 V, max. 4 A	-	
KM34	Ignition pellet unit		
KM35	WOS drive		
KM36	Mains connection from main switch		
KM37	Relay 230 V / 2.5 A	Heating circuit pump 2	
KM38	Relay 230 V / 2.5 A	Heating circuit pump 1	
KM39	230 V, max. 0.15 A	Mixing valve heating circuit 2	
KM40	230 V, max. 0.15 A	Mixing valve heating circuit 1	
KM41	230 V, max. 0.15 A	Return mixer	
KM42	230 V, max. 2 A (relay), max. 1.2 A (Triac)	Boiler pump	
KM43	Induced draught fan		
KM44	RS485	Digital room temperature sensor	

Core module	Standard assignment	Connection used for
1. The interface with DHCP client is used to integrate the boiler into a customer network. Room consoles and Fröling Connect can be linked to the boiler via this network. The network settings for the boiler and room console are assigned by a local server/router. 2. The interface with DHCP server is pre-wired to the control unit at the factory, accessible from the outside and enables connection to the boiler without a network on the customer side. The network settings for service access and room consoles are assigned by the boiler. A suitable network distribution (e.g. switch) is required for multiple connections. There is no facility for connecting the Fröling Connect to the Internet! 3. Temperature sensor type PT1000 is available only with a solar collector sensor!		

Fuses

F4	6.3 AT	Mains fuse
F6	1.0 AT	KM29, KM31
F8	1.0 AT	KM39, KM40, KM41

6.9.3 Pellet module



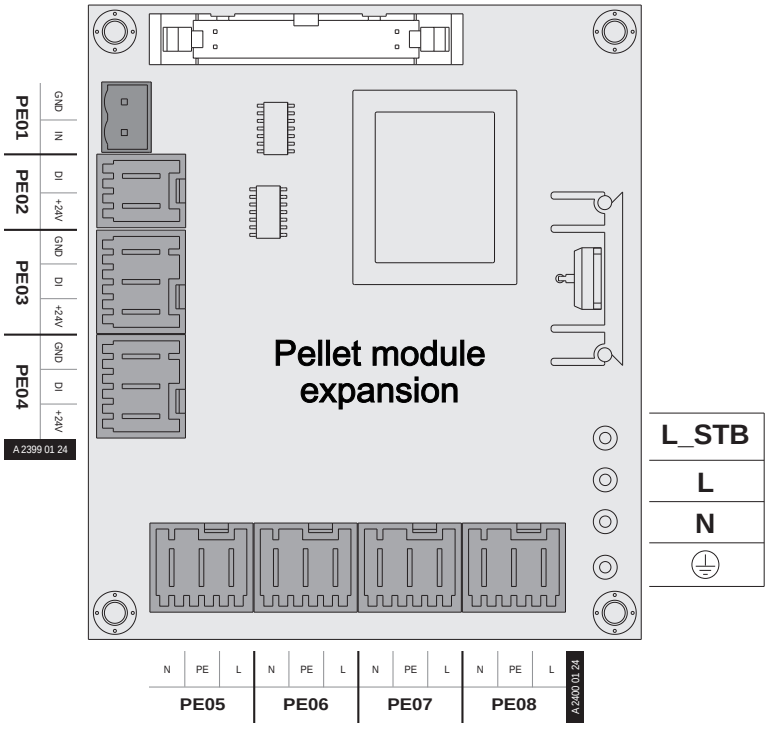
Pellet module		Standard assignment		Connection used for
PM01	Relay 230 V, max. 1 A	Pellet suction system RS4/ RS8 outputs		
		L1	Anti-clockwise rotation	
		L2	Clockwise rotation	
PM02	Relay 230 V, max. 2 A	Bag silo vibrator		
PM03	Ash screw			
PM04	Mains connection			
PM05	Induced draught turbine			
PM06	Stoker screw			
PM07	Feed screw			
PM08	Lock			
PM09	Burn back flap			

Pellet module		Standard assignment		Connection used for
PM10	Grate drive			
PM11	Supply 24 V, digital input 24 V	HV module feedback		
		DI	Wire #2	
		GND	Wire #1	
PM12	MAX level			
PM13	2x digital input 24 V	RS4/RS8 pellet suction system inputs		
		DI1	Zero point	
		DI2	Position	
PM14	Underpressure transmitter			
PM15	Gate valve			
PM16	2x transistors 24V, 0.5 A, Analogue input, 0 - 5 V	-		
PM17	Connection to core module			
PM18	Connection to hydraulic module with address 0			
PM19	Pellet unit door contact switch			
PM20	Potential-free relay, max. 2.5 A	Fault message		

Fuses

F1	50x20 mm / 250 V / 10 AT	PM01-04, PM06-07, L_STL
F2	50x20 mm / 250 V / 10 AT	PM05

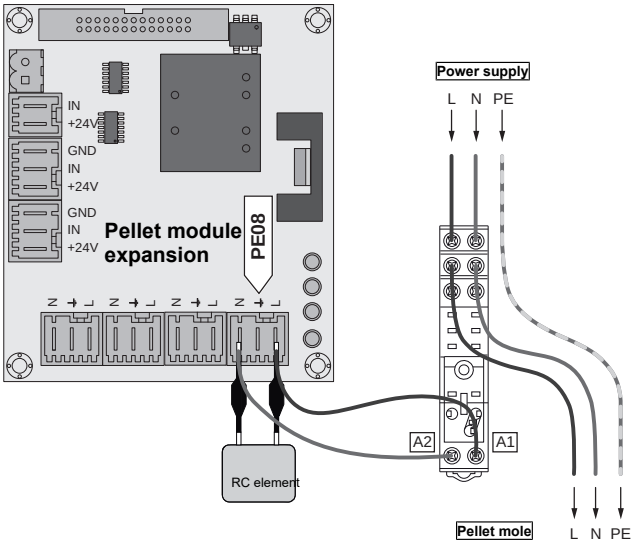
6.9.4 Pellet module expansion



Pellet module expansion		Standard assignment		Connection used for
PE01	KTY, NTC, PT1000[1)]	-		
PE02	Digital input 24 V	Room air damper feedback		
PE03	Power supply 24 V, Digital input	Jam sensor		
		GND	Blue (-)	
		TU	Black (ON)	
		+24V	Brown (+)	
PE04	Power supply 24 V, Digital input	-		
PE05	Relay 230 V, max. 1 A	-		
PE06	Relay 230 V, max. 1 A	Room air flap		
PE07	Relay 230 V, max. 1 A	-		
PE08	Relay 230 V, max. 4 A	Discharge		

1. Temperature sensor type PT1000 is available only with a solar collector sensor!

Connection instructions for pellet mole



❒ Using the RC element provided, connect terminals A1 and A2 of the relay base to ports L and N on the “PE08” output of the pellet module expansion as illustrated

❒ Connect L and N of the power supply line for the pellet mole to the "COM" terminals of the relay switch contacts and wire from the "NO" terminals to the pellet mole

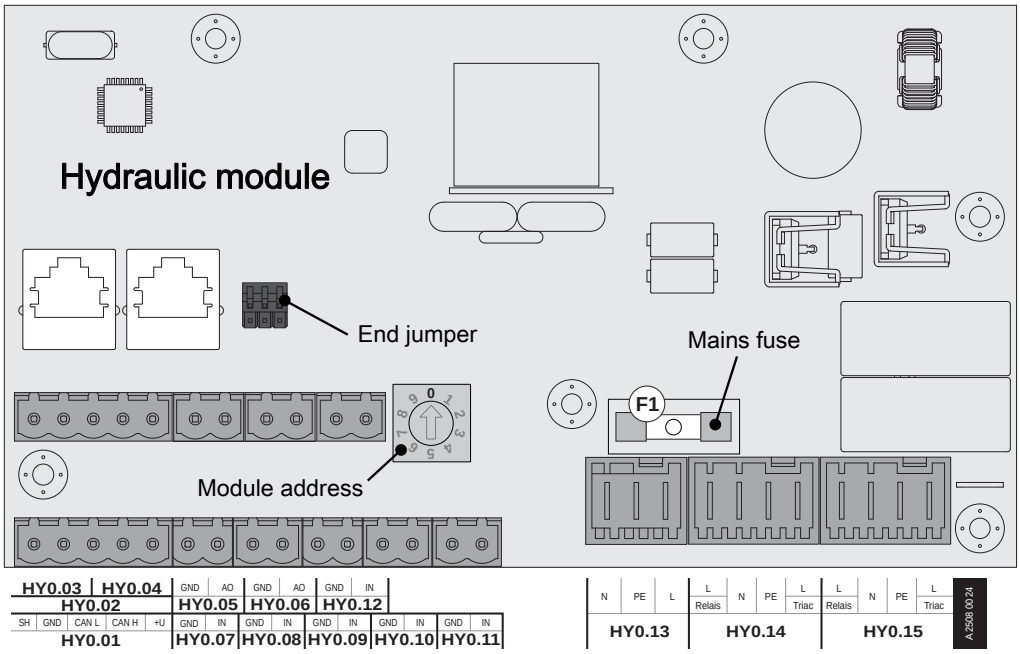
TIP: Establish the 230V supply via the connection "KM33" of the core module

6.9.5 Hydraulic module

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

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

You must ensure that the module address is assigned correctly!



Hydraulic module (module address 0)	Standard assignment	Connection used for
HY0.01	Bus (LIYCY 2x2x0.5)	External bus module	
HY0.02	Do not use	
HY0.03	Internal bus cabling	
HY0.04	Do not use	
HY0.05	PWM, 0-10 V, max. 10 mA	Signal pump 1 (HY0.14)	
HY0.06	PWM, 0-10 V, max. 10 mA	Signal pump 2 (HY0.15)	
HY0.07	KTY, NTC, PT1000[1)]	Storage tank – sensor A	
HY0.08	KTY, NTC, PT1000[1)]	Storage tank – sensor E	
HY0.09	KTY, NTC, PT1000[1)]	Storage tank – sensor H	
HY0.10	KTY, NTC, PT1000[1)]	Storage tank – sensor J	
HY0.11	KTY, NTC, PT1000[1)]	-	
HY0.12	KTY, NTC, PT1000[1)]	-	
HY0.13	Mains connection	
HY0.14	230 V, max. 2 A (relay), max. 1.2 A (Triac)	Pump 1	
HY0.15	230 V, max. 2 A (relay), max. 1.2 A (Triac)	Pump 2	

1. Temperature sensor type PT1000 is available only with a solar collector sensor!

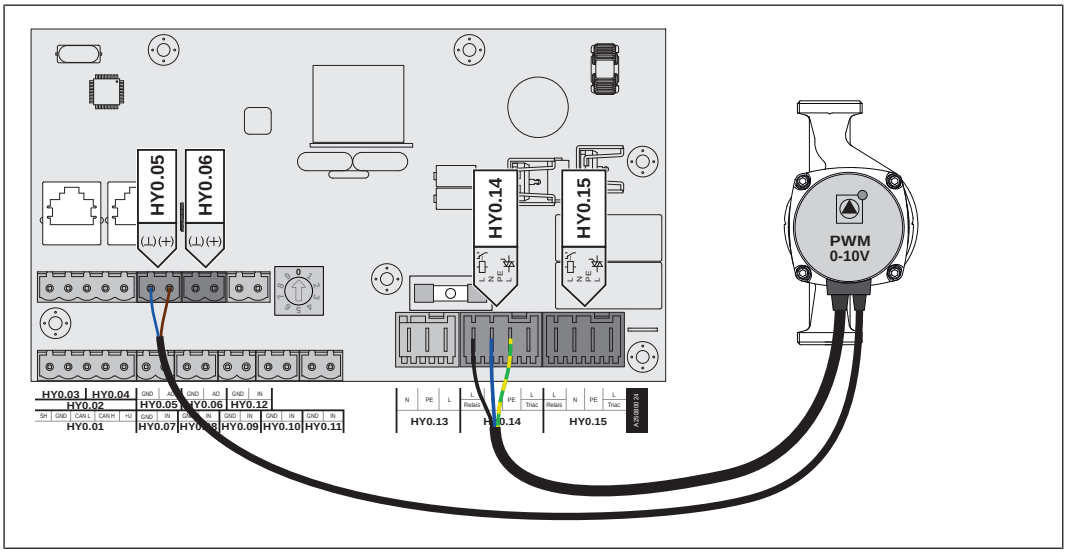
Fuses

F1	50x20 mm / 250 V / 6.3 AT	HY-14, HY-15

Connecting a circulating pump to the hydraulic module

High efficiency pump with control line (PWM / 0-10V)

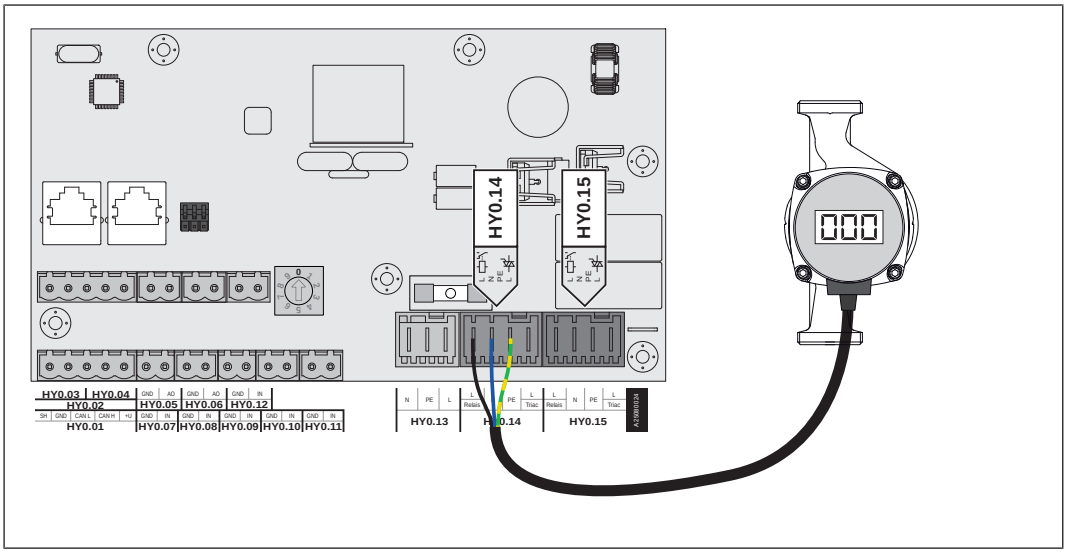
On high efficiency pumps with an additional wired control line, the speed control is implemented via the additional connection for the PWM or 0-10V signal.



- ❒ Connect the power supply for the high efficiency pump to output "HY0.14" or “HY0.15” and use the relay output for phase (L)
- ❒ Connect the PWM cable of the high efficiency pump to the corresponding port “HY0.05” or “HY0.06”
  - ↳ Make sure that the cables are configured correctly (polarity) in accordance with the connection diagram of the pump!
- ❒ Set control of the pump in the relevant menu to “Field pump / PWM” or “Field pump / 0-10V”

High efficiency pump without control signal

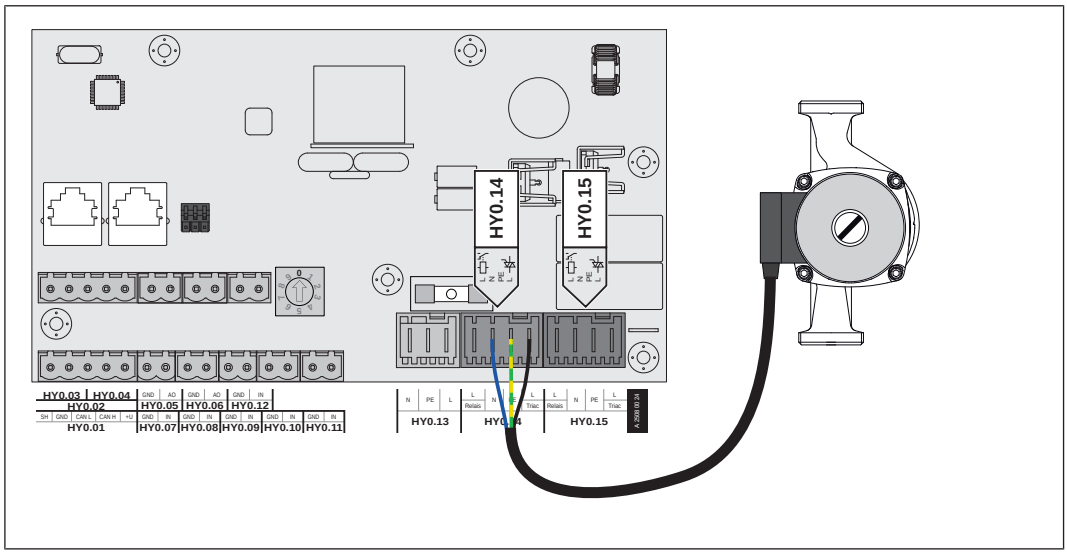
When this type of pump is used, no speed control is available! The use of a line regulating valve (e.g.: Setter balancing valve) is recommended!



- ❒ Connect the power supply for the high efficiency pump to output "HY0.14" or “HY0.15” and use the relay output for phase (L)
- ❒ In the relevant menu, set the pump to “HE pump without control signal”

AC pump without control signal (pulse package control)

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

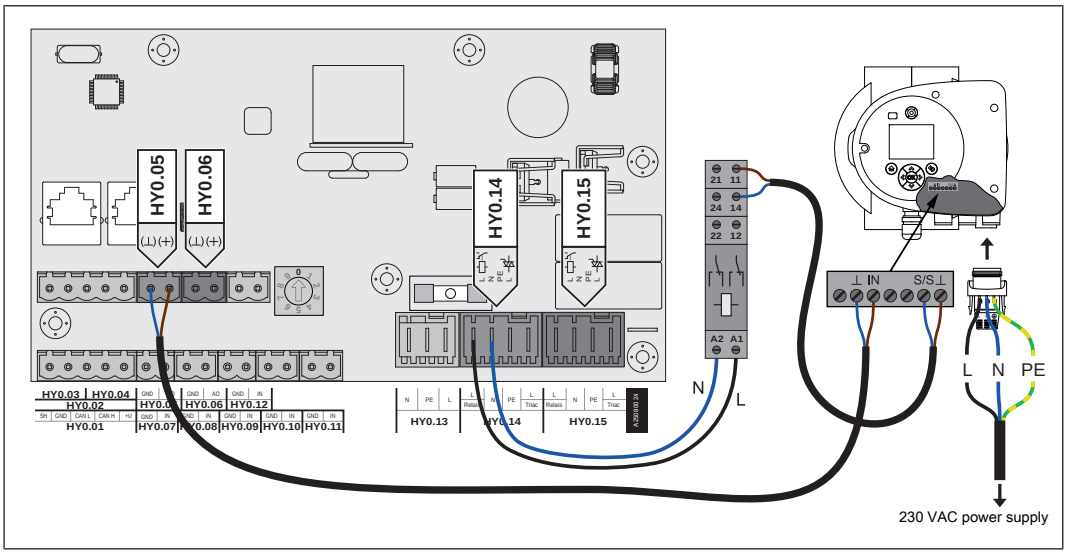


❒ Connect the power supply for the pump to output “HY0.14“ or “HY0.15“ and use the triac output for phase (L)

❒ In the relevant menu, set the pump to “Pump without control signal”

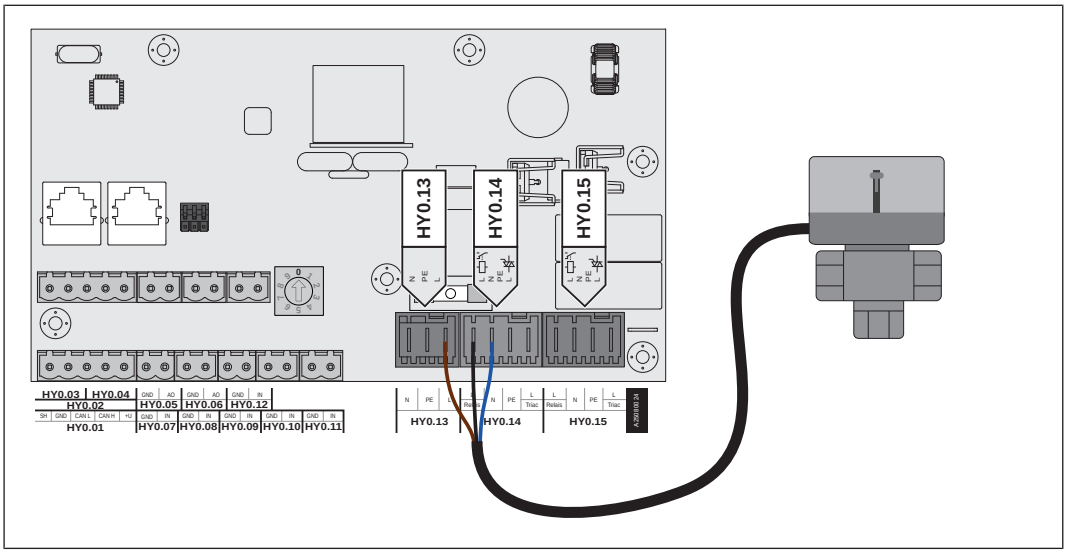
High efficiency pump with control signal and release contact

When using a high efficiency pump that requires a release contact in addition to the control signal (e.g. Grundfos Magna 3), the pump outlet of the hydraulic module is used to switch the release.



- ❒ Connect the relay of the pump to output “HY0.14“ or “HY0.15” and use the relay output for phase (L)
- ❒ Install and connect a two-core cable (2 x 0.75 mm²) from the “HY0.05” or “HY0.06” connection to the pump and connect the “+” terminal to the “IN” terminal of the pump
- ❒ Install and connect a two-core cable (2 x 0.75 mm²) from the NO contact on the relay to the pump using terminal “S/S” as the release contact
- ❒ Connect power supply at pump connector
- ❒ In the relevant menu, set the pump to “Field pump PWM + valve” or “Field pump 0-10V + valve”

Connecting an isolating valve to the hydraulic module

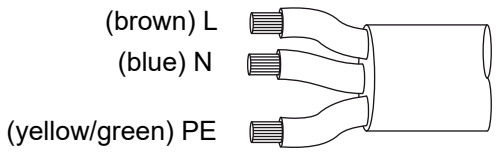
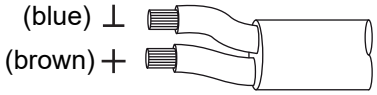


- ❒ Phase (L) for switching the valve and connecting neutral conductor (N) to output “HY0.14” or “HY0.15” using the relay output for phase (L)
- ❒ Connect the phase (L) for continuous supply (switches the valve back to the initial position) to the “HY0.13” power supply at terminal “L”

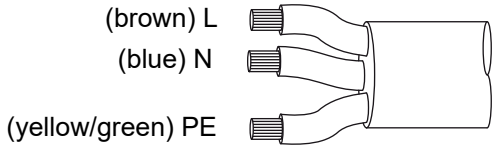
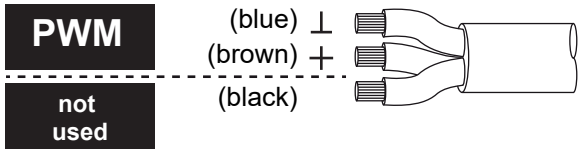
6.9.6 Connection information according to pump types

Either a 2-pin, 3-pin, or 4-pin control cable is used for the connection depending on the pump type. Please follow the connection instructions below for the wiring depending on the pump type used:

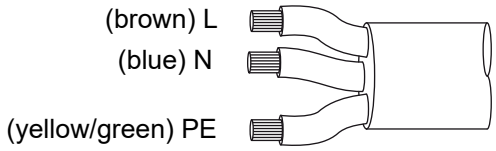
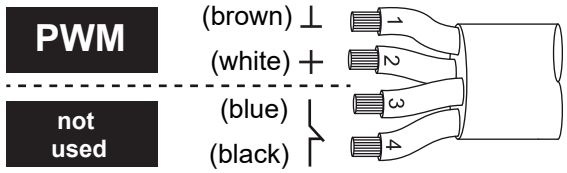
Pump type with 2-pin control cable

Power supply	2-pin control cable
	
Wire the power supply to the pump outlet on the board	Connect the control cable to the PDM output on the board, making sure that the polarity is correct: - blue wire to earth - brown wire to plus

Pump type with 3-pin control cable

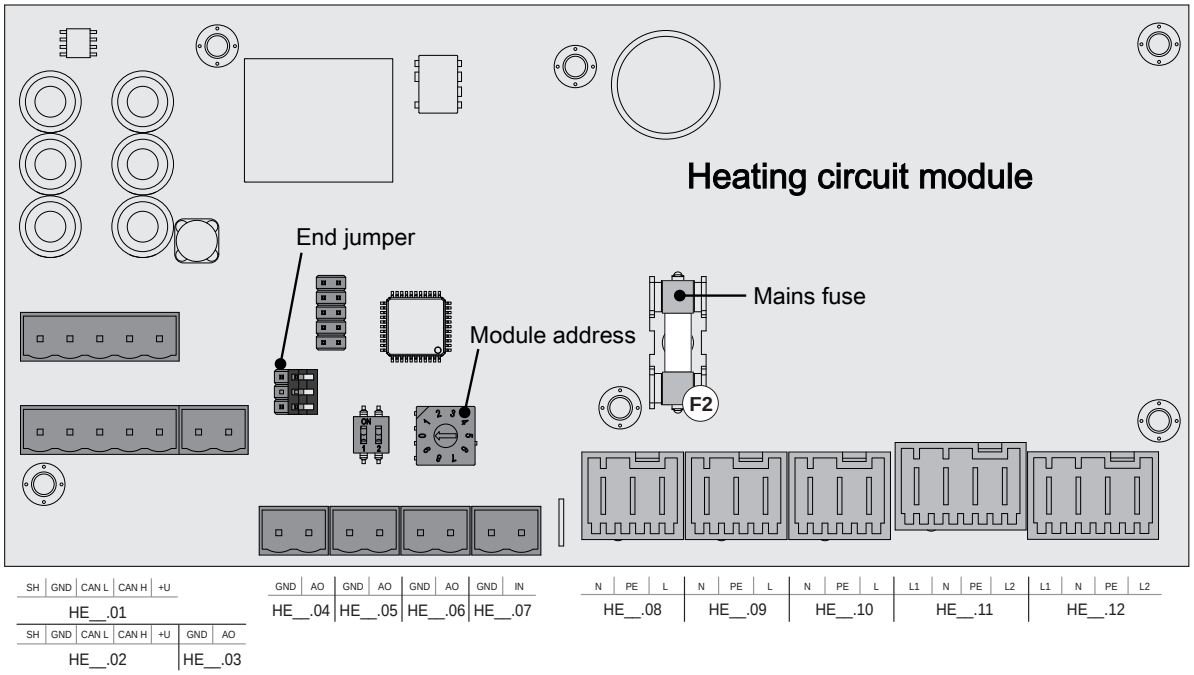
Power supply	3-pin control cable
	
Wire the power supply to the pump outlet on the board	Connect the control cable to the PDM output on the board, making sure that the polarity is correct: - blue wire to earth - brown wire to plus Do not use the black wire and insulate if necessary

Pump type with 4-pin control cable

Power supply	4-pin control cable
	
Wire the power supply to the pump outlet on the board	Connect the control cable to the PDM output on the board, making sure that the polarity is correct: - brown wire to earth - white wire to plus Do not use the other two wires (blue, black) and insulate

6.9.7 Heating circuit module

Two heating circuits can be controlled as standard with the core module.
To add further heating circuits, the heating circuit module boards must be expanded. Expansion can include up to eight heating circuit modules (addresses 0 to 7). A total of up to 18 heating circuits can be controlled. It is important to ensure that the module address is set correctly.



Heating circuit module		Standard assignment	Connection used for
HE_.01	Bus (LIYCY 2x2x0.5)	-	
HE_.02	Bus (LIYCY 2x2x0.5)	-	
HE_.03	KTY, NTC	Flow temperature sensor 1	
HE_.04	KTY, NTC	Flow temperature sensor 2	
HE_.05	KTY, NTC	Room temperature sensor 1	
HE_.06	KTY, NTC	Room temperature sensor 2	
HE_.07	KTY, NTC	Sensors	
HE_.08	Mains connection		
HE_.09	230 V, 500 W, max. 2.5 A	Pump 1	
HE_.10	230 V, 500 W, max. 2.5 A	Pump 2	
HE_.11	230 V, max. 0.15 A	Mixing valve 1	
HE_.12	230 V, max. 0.15 A	Mixing valve 2	

Fuses

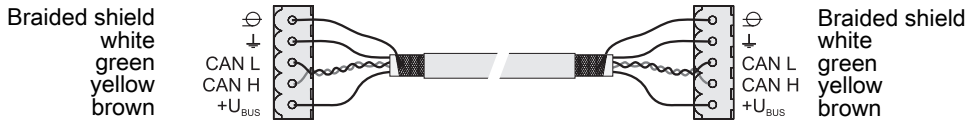
F2	50x20 mm / 250 V / 6.3 AT	HE-09, HE-10, HE-11, HE-12

6.9.8 Bus connection for circuit boards

All of the bus models are connected with a bus line. The specification of the cable that is used must adhere to the LIYCY 2x2x0.5 type. A maximum cable length of 200 m must be observed. The cable length can be extended using the Fröling bus repeater.
The bus modules must be connected in series; although no specific sequence of the module types and addresses is specified. A star/stub cable is not permitted.

Connecting the bus cable

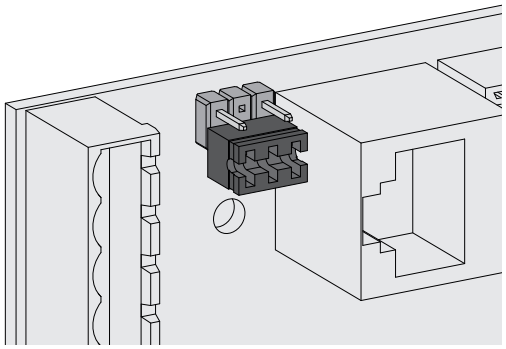
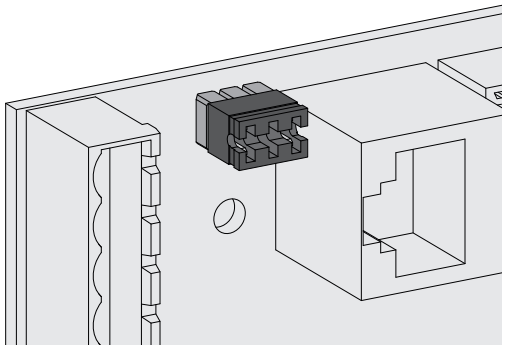
For the bus connections between the individual modules, cable type **LIYCY paired 2x2x0.5** should be used. The connection to the 5-pin plugs should be carried out according to the following diagram:



Setting end jumpers

IMPORTANT! To ensure smooth running of the bus system, the jumper must be set on the first and last module.

When using a bus repeater, the two galvanically separated sub-networks must be considered separately. The jumpers for each network must be set on the first and last module.

End jumper not set	End jumper set
	

If the contacts at the base of the end jumper are not bridged (image left), it is referred to as “not set". In this case there is no bus termination. If the contacts are closed (image right), the end jumper is set and the bus connection is terminated.

Setting the module address

The necessary order for hydraulic modules and heating circuit modules is set with the module addresses. The first board of a module type should always have the address 0, so that the standard hydraulic systems set do not have to be subsequently configured. For further module types rising module addresses (address 1 - 7) are set.

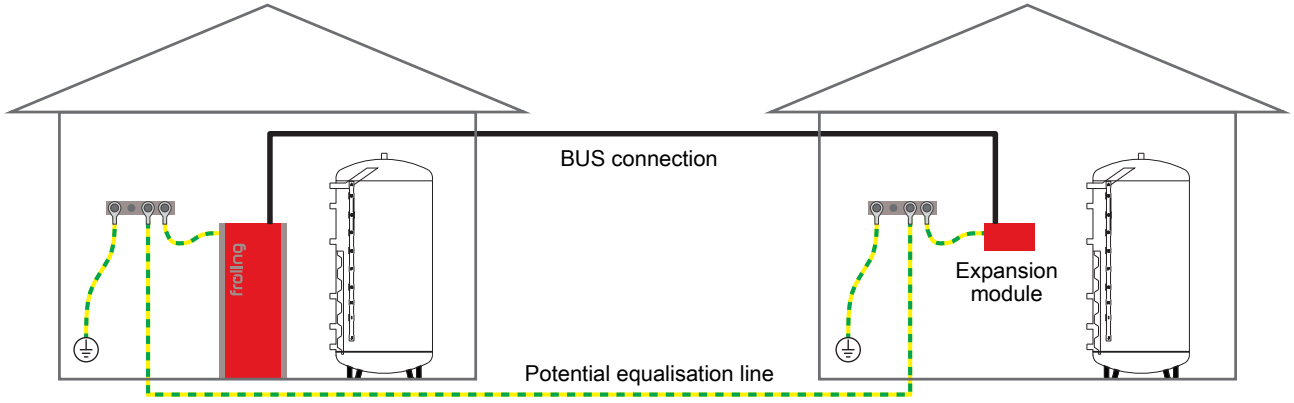
Important! Set the module address onl;y once the device has been disconnected from the power supply!

Set module address	Heating circuit module	Hydraulic module	
	Heating circuit	Sensors	Pump
0	03 – 04	0.1 – 0.6	0.1 – 0.2
1	05 – 06	1.1 – 1.6	1.1 – 1.2
2	07 – 08	2.1 – 2.6	2.1 – 2.2
3	09 – 10	3.1 – 3.6	3.1 – 3.2
4	11 – 12	4.1 – 4.6	4.1 – 4.2
5	13 – 14	5.1 – 5.6	5.1 – 5.2
6	15 – 16	6.1 – 6.6	6.1 – 6.2
7	17 – 18	7.1 – 7.6	7.1 – 7.2

Potential equalisation / potential separation

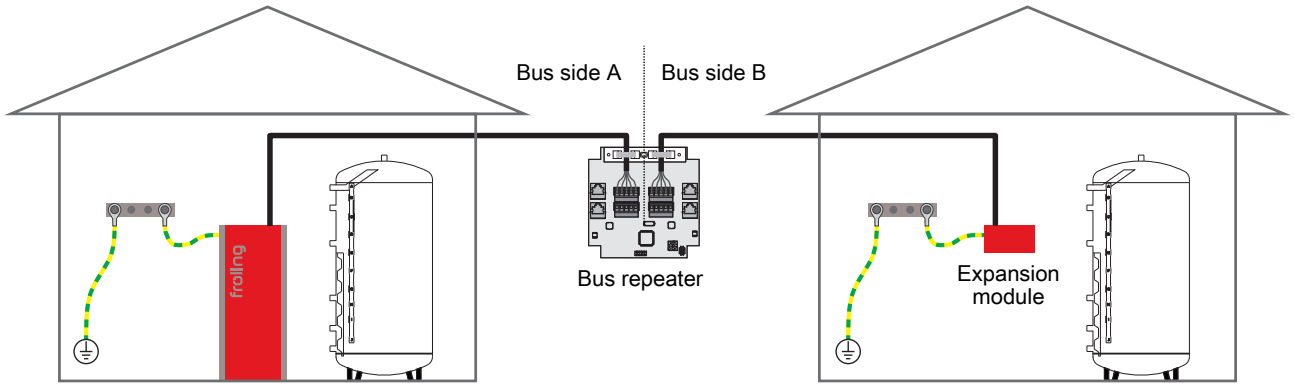
There can be potential shifts between buildings. In this case, equalising currents flow via the bus connection shield which can damage the modules.

To prevent this, buildings must be connected using a potential equalisation conductor.

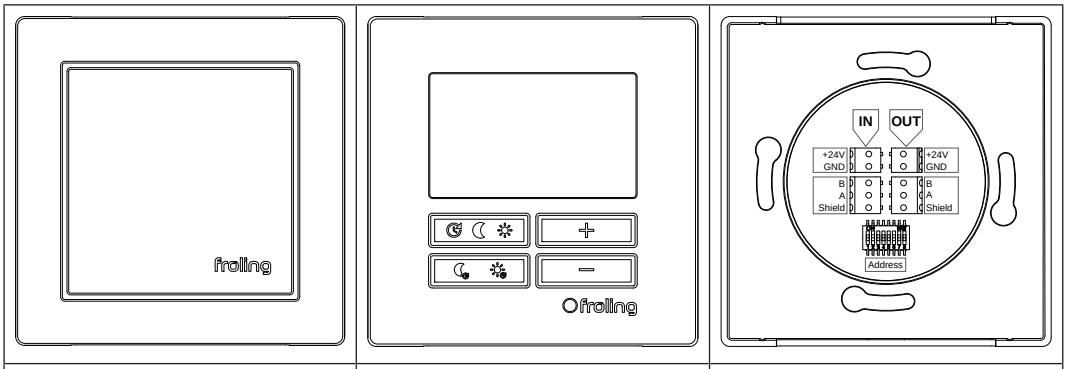


IMPORTANT! The dimensions of the equalization line must be installed by a specialist in accordance with regional regulations.

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



6.9.9 Bus connection for digital room temperature sensors/room controllers

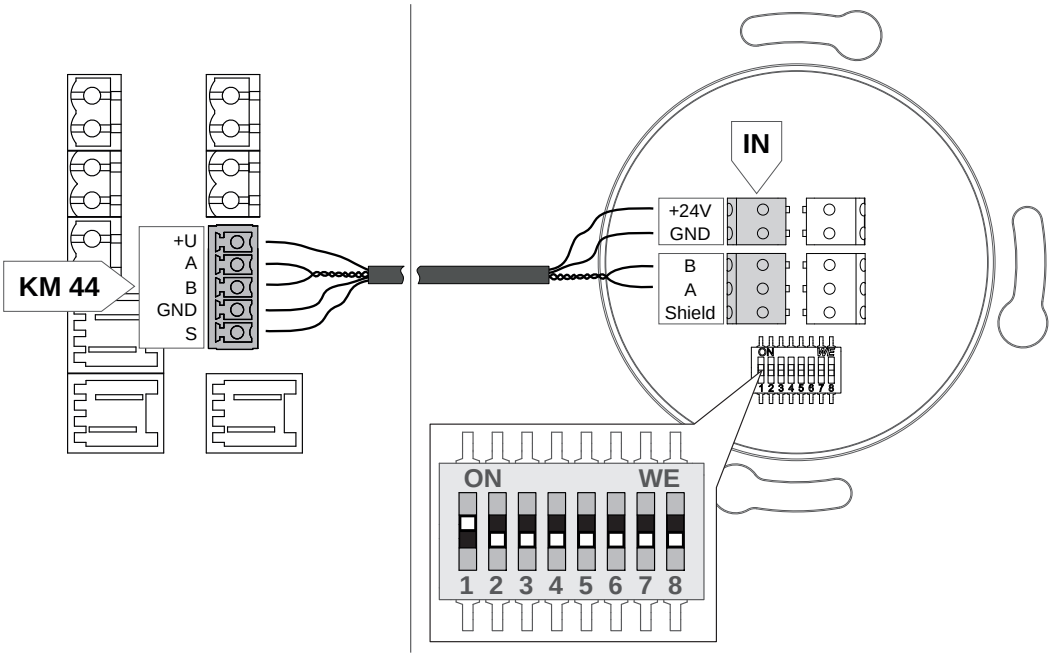


Digital room temperature sensor	Digital room controller	Rear connection (4-wires + shield)

All digital room temperature sensors and room controllers are connected in series and connected to the RS485 connection (KM44) of the core module.

A connection cable of CAT5e or higher with a wire cross section of AWG 27 (0.102 mm²) to AWG 22 (0.326 mm²) is used as the connecting cable. For longer cable lengths a larger cross-section should be used to avoid the voltage drop. The limit here is the maximum number of room temperature sensors/room controllers for AWG27 up to 100m and for AWG22 up to 300m. For easier connection of the shielding, we recommend a cable with an integrated ground wire.

The connection must be carried out according to the following diagram:



❒ Connect the CAT5e installation cable to the core module at connection KM44

↳ Use a twisted pair of wires for the "A" and "B" connections

↳ Connect the cable shield to terminal "S"

❒ Connect the cable on the back of the room temperature sensor/room controller to the input terminals (VIN, BUSIN) according to the wire colours used on the core module

↳ The shield must not be connected to the last room temperature sensor/room controller!

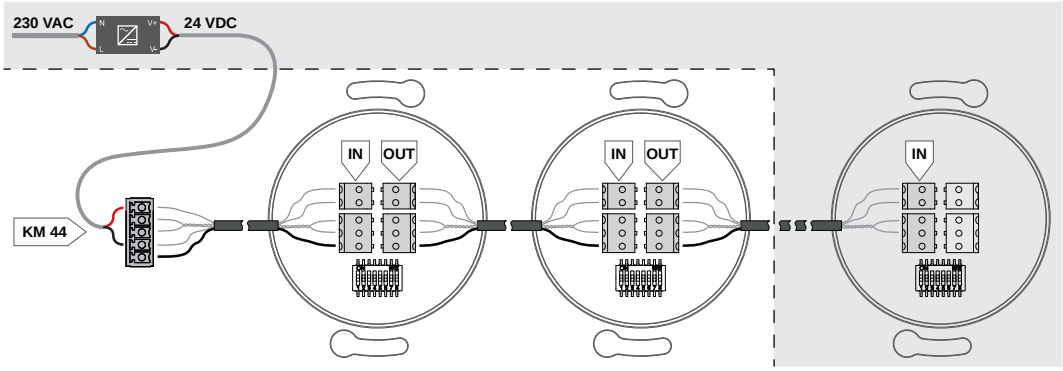
❒ Set the device address and bus termination at the DIP switch
➲ "Device address and bus termination" [▸ 104]

Limit values of the integrated power supply

The connected load of the 24 VDC power supply integrated in the core module is limited to approx. 2.4 W and is therefore only designed for a certain number of connected components. The following table shows the combination of supplied components.

Analogue module	Digital room controller	Digital room temperature sensor
-	-	24
-	1	19
-	2	14
-	3	9
-	4	4
1	-	10
1	1	5
1	2	-

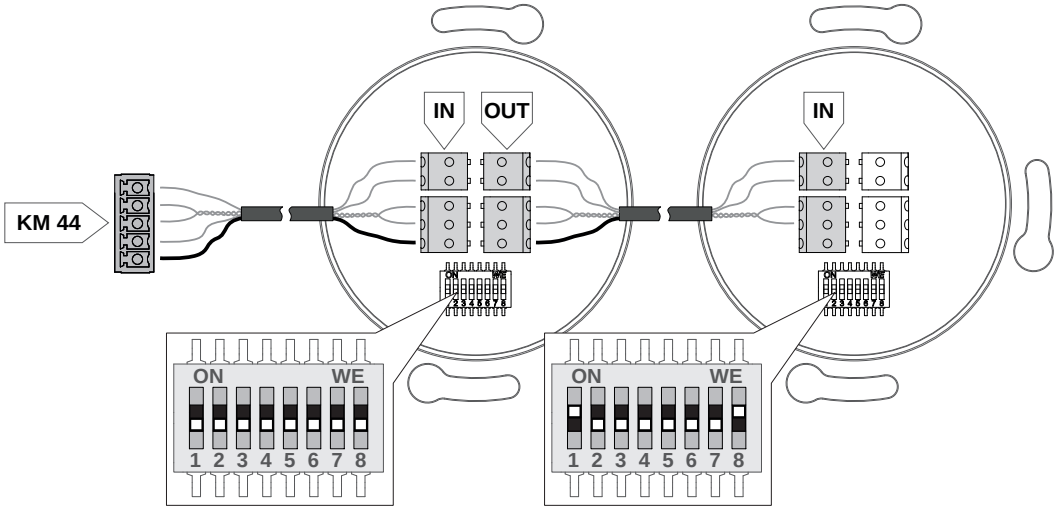
If more components are supplied from the connection on the core module, an external power supply unit allows the total connected load to be increased.



The following applies to an external 24 VDC power supply:

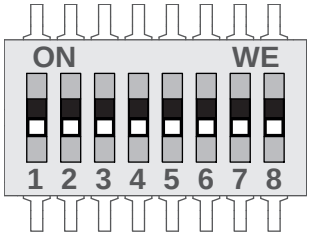
- ❒ Dimension the output power of the feeding 24 VDC power supply unit according to the additional number of components
- ❒ Connect the power supply unit to pin "U+" and "GND" on the KM44 connector

Device address and bus termination



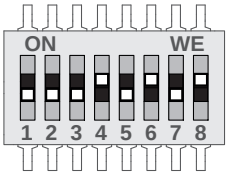
A total of 32 room temperature sensors/room controllers can be integrated into the system. The device address is set at the DIP switch (4-8) within a range of 32 to 63. The shielding of the connection cable is not connected on the last device; instead the bus termination is activated.

Switch assignment at the DIP switch



DIP 1	**Bus termination** ON: Termination active OFF: Termination inactive
DIP 2	**Bus bit rate** ON: Baud rate 9600 OFF: Baud rate 19200 (default setting)
DIP 3	**Display type** Preset hardware identification of the room unit, do not change the factory setting
DIP 4	**Address switch** ON: Increment the device address by "16" OFF: -
DIP 5	**Address switch** ON: Increment the device address by "8" OFF: -
DIP 6	**Address switch** ON: Increment the device address by "4" OFF: -
DIP 7	**Address switch** ON: Increment the device address by "2" OFF: -
DIP 8	**Address switch** ON: Increment the device address by "1" OFF: -

Calculation of the device address



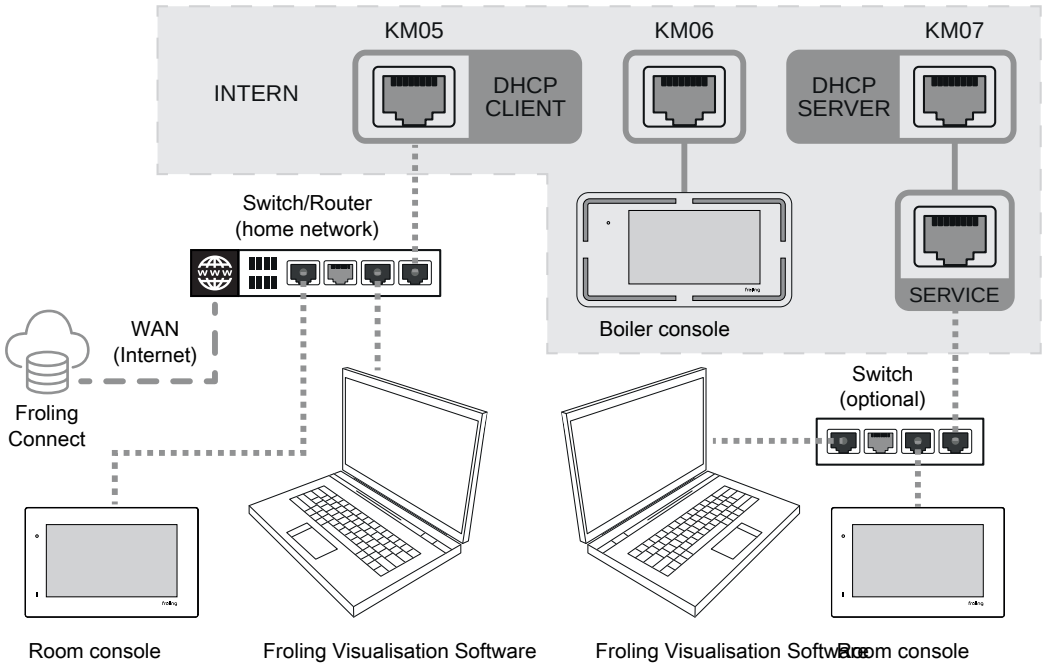
If all address switches (DIP 4-8) are in the "OFF" position, the first address is 32. All other addresses are made up by adding the active address switches.

Example of the composition at device address 53:

```
32(base) + 16(DIP4="ON") + 4(DIP6="ON") + 1(DIP8="ON") = 53
```

6.9.10 LAN connection for service, room console and Fröling Connect

The core module has two free LAN interfaces with RJ45 connection. The following diagram shows the connection options:



Client interface / LAN (KM05)

The client interface is used to integrate the boiler into a customer network. This network can be used to link room consoles and Fröling Connect to the boiler and enable access with the Fröling visualisation software.

Specification:

- Interface with activated DHCP client (default setting):
  The network settings of the boiler are assigned by a local server/router
- Interface with DHCP client deactivated:
  The network settings of the boiler must be configured manually
- Multiple connections regulated by the customer's network

Display interface / LAN (KM06)

The display interface is only designed for connecting the boiler display to the core module. The interface cannot be used for integration into a network!

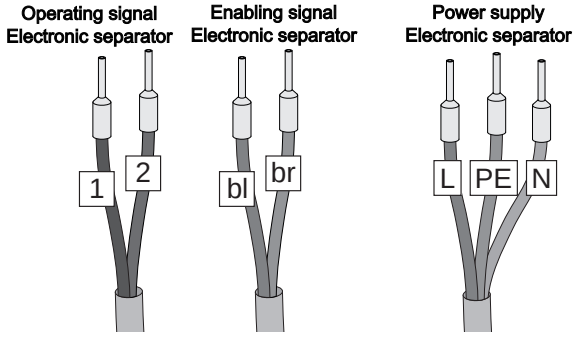
Service interface / LAN (KM07)

The service interface is pre-wired to the control unit at the factory, is accessible from the outside and enables connection to the boiler without a network on the customer side. The boiler assigns the required network settings to connected room consoles and/or terminal devices for service access. The interface cannot be used for connection to Fröling Connect!

Specification:

- Interface active as DHCP server (the network information is assigned to the connected participants)
- Multiple connections (max. 20 participants) require an additional network switch

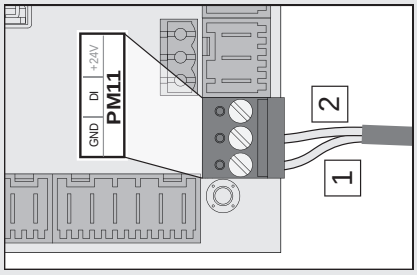
6.9.11 Connecting the electrostatic particle separator



Operating signal for the electronic separator:

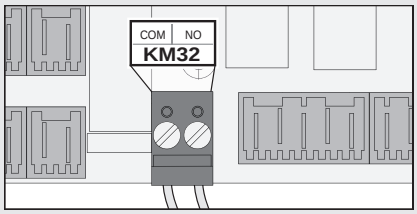
Wire "1" (earth) on pellet module PM11 (GND)

Wire "2" (feedback) on pellet module PM11 (DI)



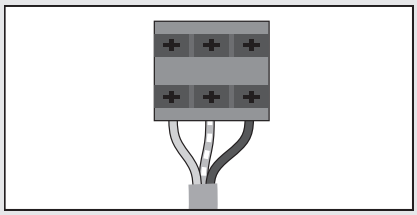
Enabling signal for the electronic separator:

Connect the brown and blue wires to terminal KM32 on the core module (no polarity to be observed)

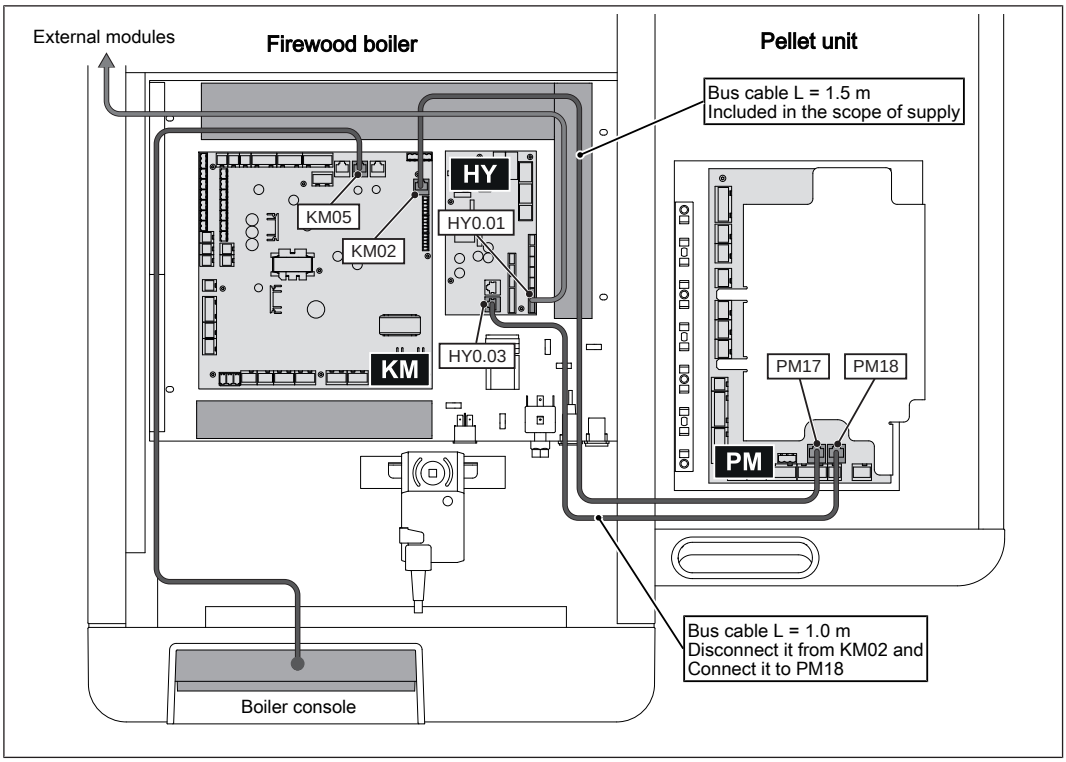


Power supply to the electronic separator:

Connect the 230 VAC power supply line to the appliance connection terminal in the boiler controller

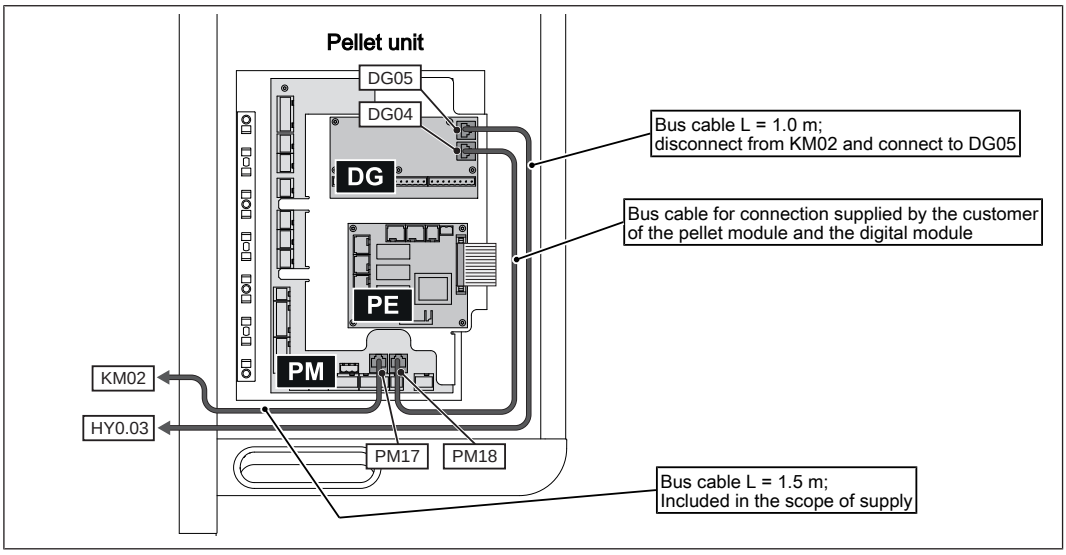


6.9.12 Bus connection to pellet unit

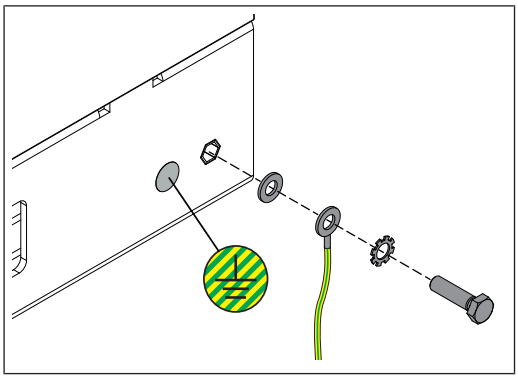


- Connect all of the firewood boiler and pellet unit modules to one another in series (cable type LIYCY 2x2x0.5), starting with the core module (KM).
- The hydraulic module (HY) is the last module of the internal boiler BUS connection.
- If no external modules are connected to the hydraulic module, place the end jumper on the hydraulic module.
- External modules are also connected in series, starting with the hydraulic module (HY-01). The end jumper must be placed on the last external module.

When installing a digital module:

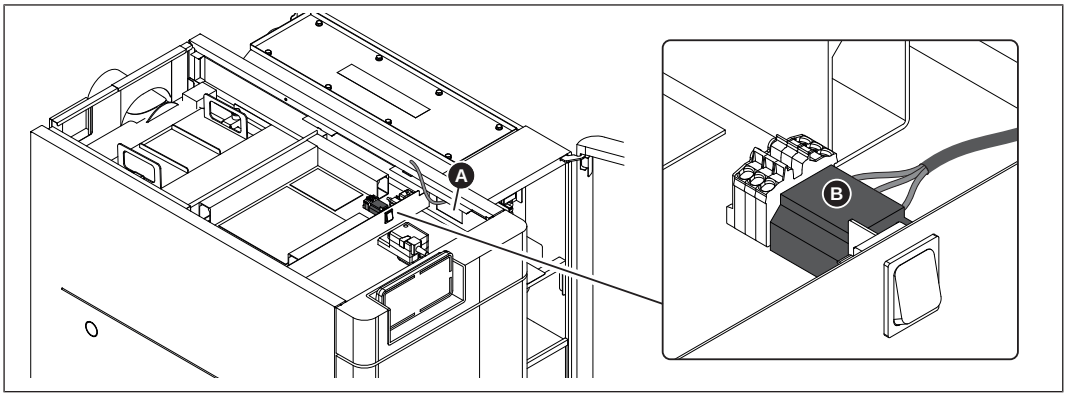


6.9.13 Potential equalisation



❒ The potential equalisation on the boiler base must comply with current directives, regulations and standards.

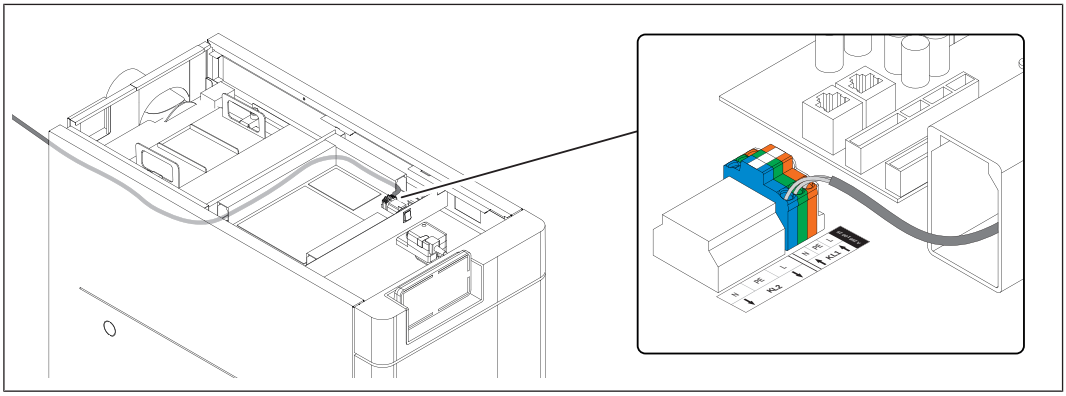
6.9.14 Pellet unit power supply



❒ Route the power supply cable through the side recess (A) to the boiler controller and connect it to the appliance connection terminal block (B)

6.9.15 Mains connection

Once the individual components have been wired:



❒ Thread the mains connection cable into the cable duct via the back panel and run to the front of the boiler controller

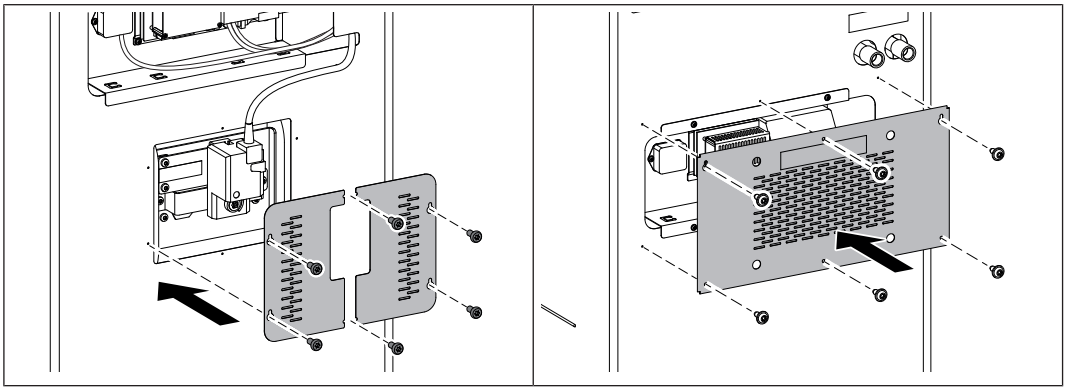
❒ Use cable ties to secure the mains connection cable to the strain reliefs and connect the power supply to the terminal blocks (KL1) as per the label.

↳ The power supply line (mains connection) must be fitted with a C16A fuse by the customer.

↳ Flexible sheathed cable must be used for the wiring; this must be of the correct size to comply with applicable regional standards and regulations.

6.10 Concluding work

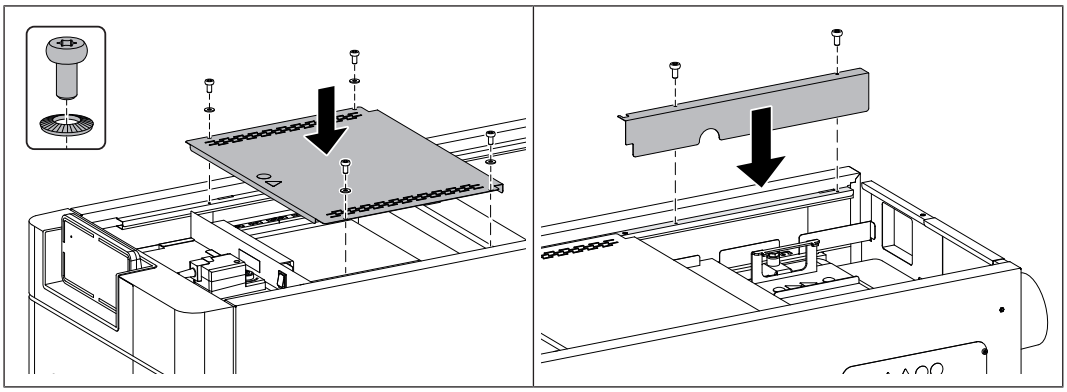
6.10.1 Mount the cladding on the firewood boiler



❒ Fitting the cover plates to the secondary air servo-motor
- 6 x M5 x 10 lens-head screws

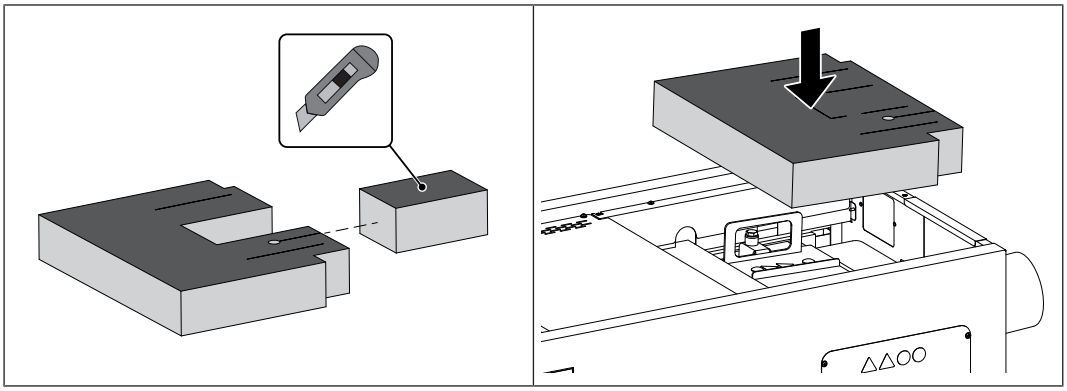
If an electrostatic particle separator is fitted

❒ Fit the cover plate to the back panel
- 6 x M5 x 10 lens-head screws



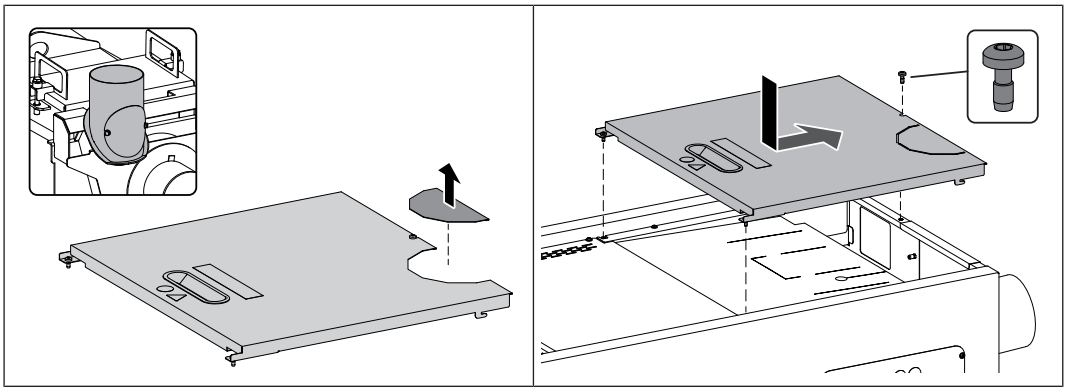
❒ Fitting the controller cover
- 4x M5x10 lens-head screws including contact washer

❒ Install the cover for the cable duct
- 2x M5x10 lens-head screws



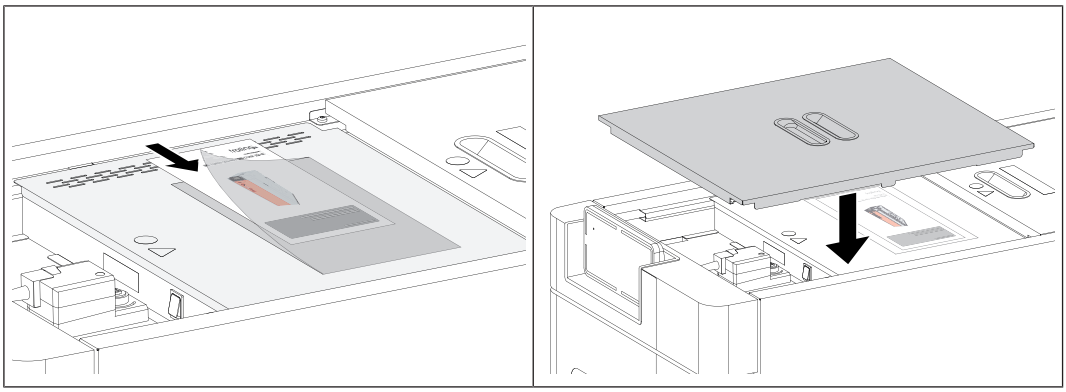
❒ In the case of an electrostatic particle separator:
Remove the perforation from the thermal insulation

❒ Place thermal insulation in the area of the heat exchanger cover



❒ For boilers with flue gas pipe connection at the top:
Punch out the perforation on the rear cover and remove the burrs using a half-round file

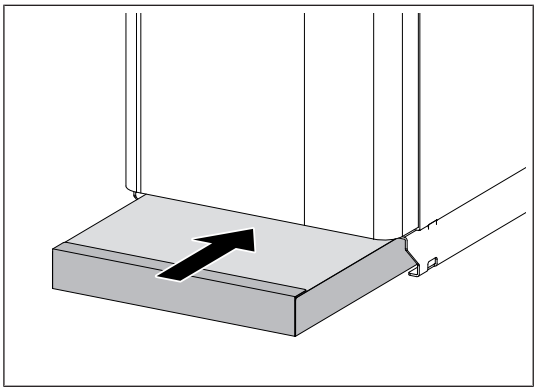
❒ Thread in the rear cover at the rear and secure in place
- 3 x M5 x 12 lens-head screws



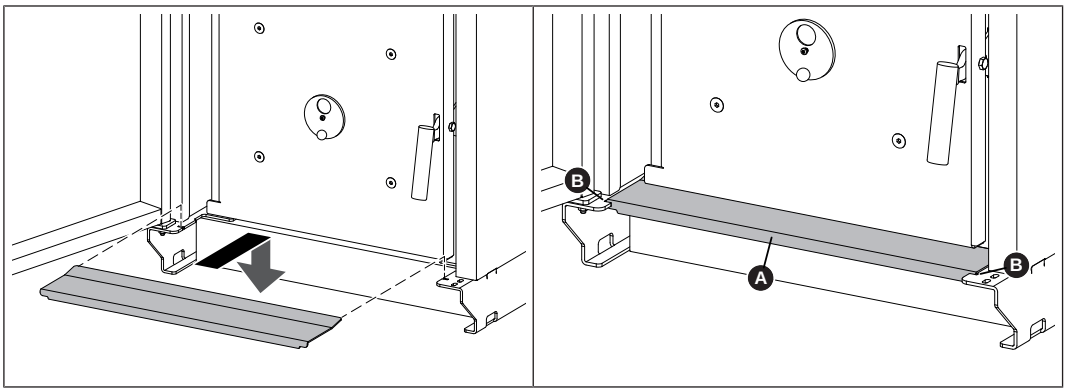
❒ Attach the supplied document pocket to the controller cover

❒ Enter the pin assignment of the components in the supplied terminal diagram and stow the terminal diagram in the document bag

❒ Place the front cover on the boiler



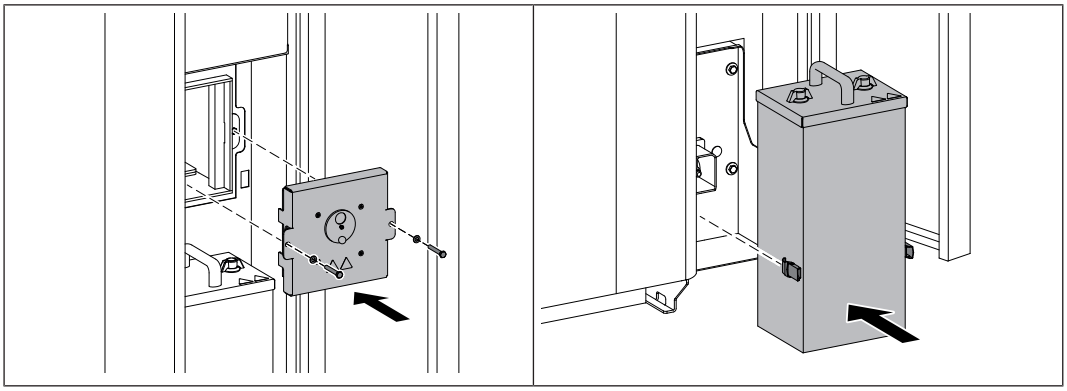
❒ Slide the floor insulation underneath the boiler from the front



❒ Insert the cover plate under the combustion chamber door

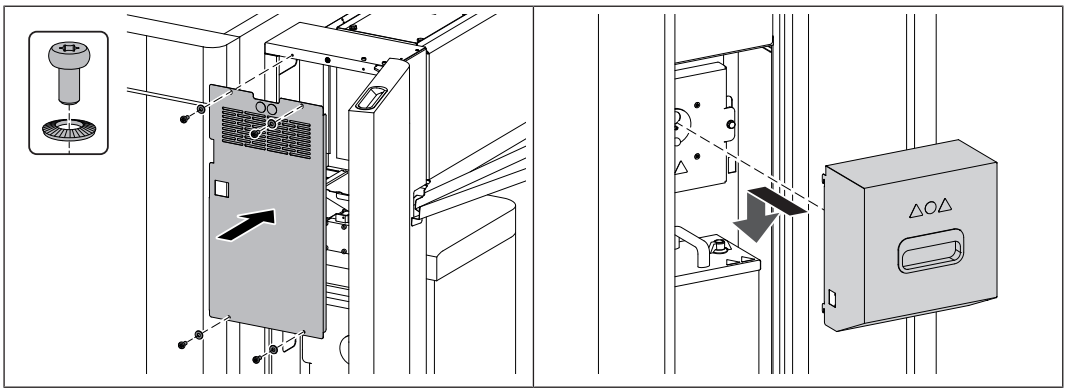
↳ Hook the folded lug (A) into the recess (B) on the left and right of the boiler base

6.10.2 Fitting the cladding to the pellet unit



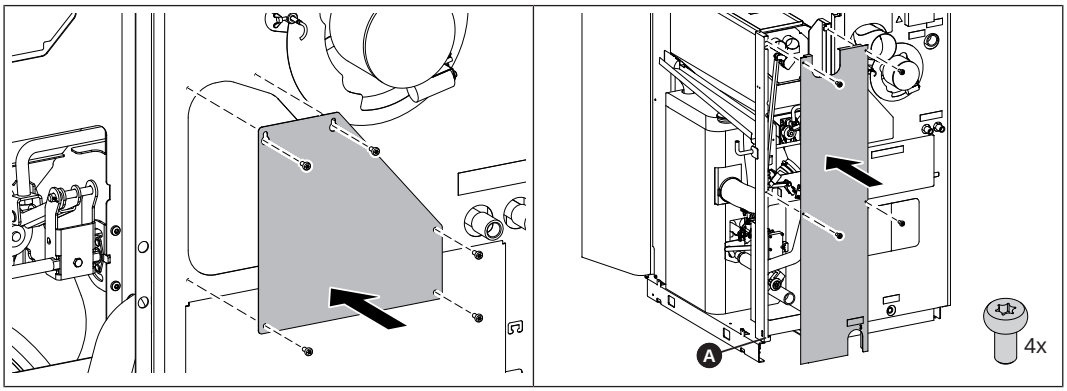
❒ Install combustion chamber cover
- 2x M8 x 55 hexagon head screws

❒ Slide the ash container on to the ash duct and secure it with clamp fasteners



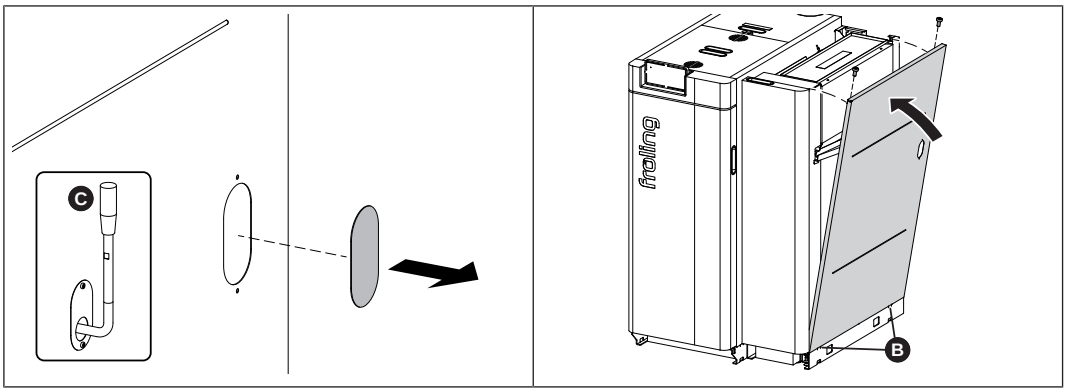
❒ Install the controller cover of the pellet unit
- 4x M5 x 10 lens-head screws including contact washers

❒ Hang the cover of the combustion chamber cover on the cladding



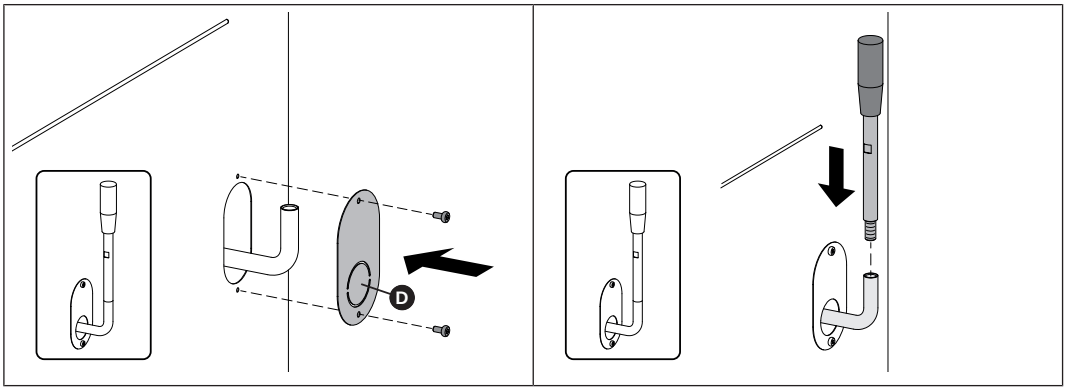
❒ Fit the blanking plate to the back panel
- 5x M5 x 10 lens-head screws

❒ Attach the back panel to the boiler base (A) and fix it in place
- 4x M5 x 10 lens-head screws



❒ **For boiler with manual WOS (C):**
Remove the pre-punched blank on the right-hand side panel

❒ Insert the right side panel into the lugs (A) on the bottom of the boiler and secure it with screws at the top
- 2x M5 x 10 lens-head screws

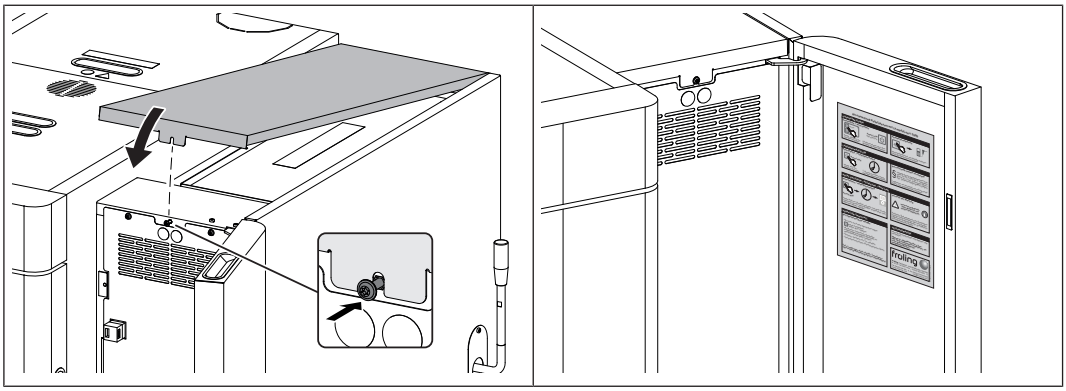


For boiler with manual WOS:

❒ Remove the pre-punched blank (D) from the cover plate and file off the burrs with a half-round file

❒ Thread the cover plate on to the WOS shaft and fit to the side panel
- 2x M5 x 10 lens-head screws

❒ Screw the WOS lever into the WOS shaft

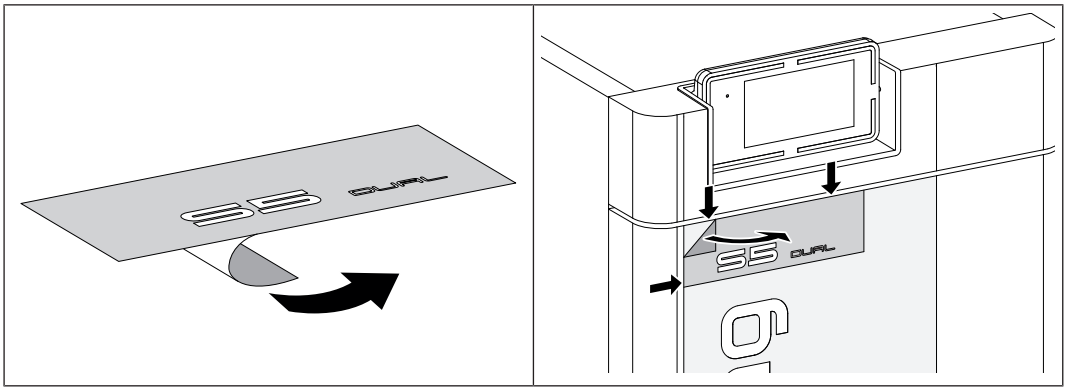


❒ Thread the cover on to the rear and place it on the pellet unit

❒ Secure the cover with the retaining screw at the front

❒ Affix the supplied maintenance sticker to the front door of the pellet unit where it can be clearly seen

6.10.3 Positioning the boiler stickers



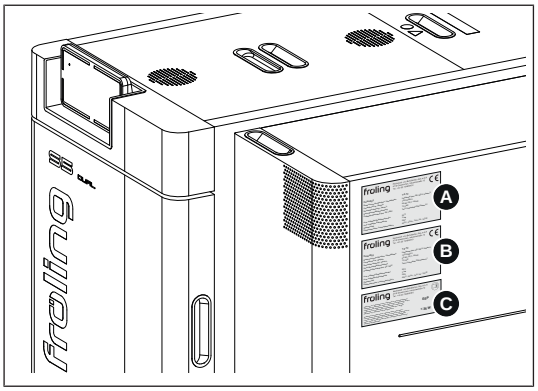
❒ Remove the protective film from the sticker

❒ Position the backing film featuring “S5 Dual” in the upper left corner of the insulated door, ensuring all the air bubbles have been removed

❒ Make several passes over the sticker so the writing adheres to the insulated door

❒ Carefully pull off the transparent backing film

6.10.4 Affixing the identification plate



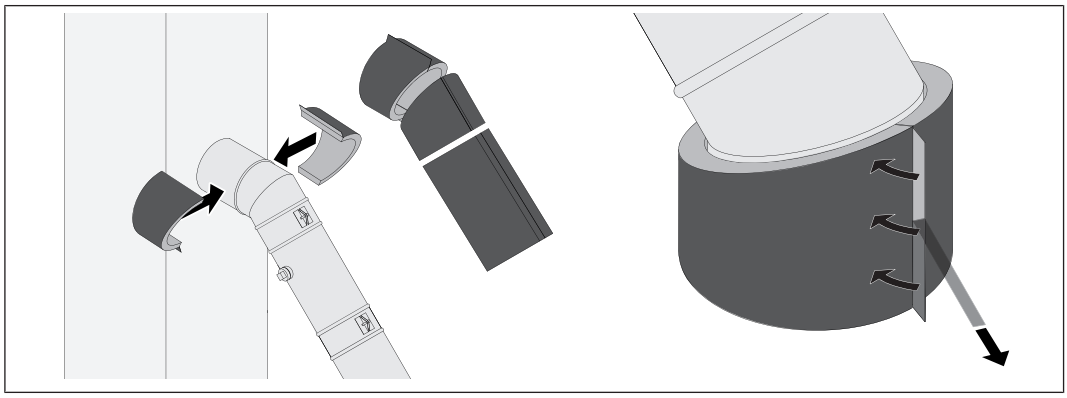
❒ Stick the supplied identification plates for the firewood boiler (A) and the pellet unit (B) to the boiler where they are clearly visible

For the S5 Dual electrostatic particle separator:

❒ Affix the additional identification plate (C) for the electrostatic particle separator below the boiler identification plates

6.10.5 Insulate the connection line

When using the optionally available thermal insulation supplied by Fröling GesmbH, perform the following steps:



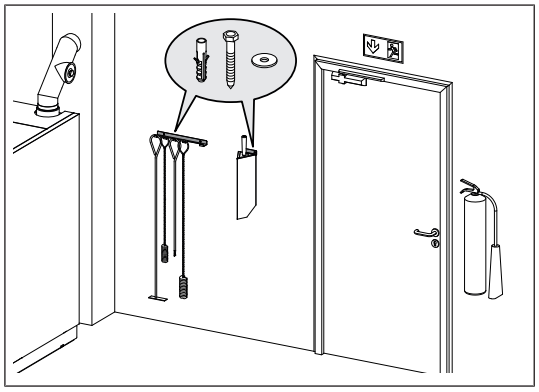
❒ Cut the half shells of thermal insulation to length and lay them on the connection line

❒ Create an opening for access to the measuring port

❒ Apply protective foil at the projecting lugs

❒ Glue the half shells to each other

6.10.6 Install the brackets for accessories



❒ Using appropriate fasteners, attach the brackets to the wall on the boiler

❒ Attach the accessories to the brackets

7 Start-up

7.1 Before commissioning / configuring the boiler

The boiler must be configured to the heating system during initial start-up!

IMPORTANT

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

Take the following precautions:

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

IMPORTANT

Foreign bodies in the heating system impair its operational safety and can result in damage to property.

As a result:

❒ The whole system should be rinsed out before initial start-up in accordance with EN 14336.

❒ Recommendation: Make sure the hose diameter of the flush nozzles in the flow and return complies with ÖNORM H 5195 and is the same as the hose diameter in the heating system, however not more than DN 50.

❒ Switch on the main switch and configure the boiler controller to the type of system

❒ Check the system pressure of the heating system

❒ Check that the heating system is fully ventilated

❒ Check all quick vent valves of the entire heating system for leaks

❒ Check that all screw connections at water-bearing joints are tightly sealed

↳ Pay particular attention to those connections from which plugs were removed during assembly

❒ Check the entire hydraulic pipework for leaks

❒ Check that all necessary safety devices are in place

❒ Check that there is sufficient ventilation in the boiler room

❒ Check the leaktightness of the boiler

↳ All doors and inspection openings must be tightly sealed!

❒ Check that the drives and servo-motors are working and turning in the right direction

❒ Check that the door contact switch is working efficiently.

IMPORTANT! Check the digital and analogue inputs and outputs!

7.2 Initial startup

7.2.1 Permitted fuels

Wood pellets

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

Note on standards

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

General note:

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

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

Firewood

Firewood up to max. 55 cm long.

Water content

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

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

Note on standards

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

Tips for storing wood

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

Storage time dependent upon water content

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

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

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

7.2.2 Fuels permitted under certain conditions

Wood briquettes

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

Note on standards

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

Notes on use

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

7.2.3 Non-permitted fuels

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

IMPORTANT

In the event that non-permitted fuels are used:

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

For this reason, when operating the boiler:

❒ Use only the permitted fuels

7.2.4 Heating up for the first time

Follow the relevant assembly instructions for the firewood boiler when heating up in firewood mode for the first time or when screed drying the combustion chamber.

⚠ CAUTION

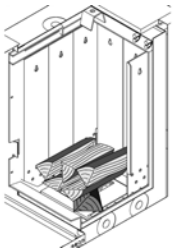
If the boiler heats up too quickly on initial start-up:

If the output during the heating-up process is too great, the combustion chamber may be damaged as a result of drying out too rapidly!

For this reason the following applies the first time you heat up the boiler:

❒ Start the firewood boiler for the first time in accordance with the heating instructions

Heating instructions when starting up a firewood boiler for the first time



❒ Place a piece of wood diagonally across the combustion chamber (see diagram on left)

↳ Load the boiler with a small amount of firewood (max. 10-20% of the fuel loading chamber)

↳ Ignite it and allow it to burn slowly with the central pre-heating chamber door open

IMPORTANT! Fissures are normal and do not indicate a malfunction

Once the material in the boiler has burnt down, the boiler can be used in accordance with the operating instructions ("Operating the system" section).

IMPORTANT

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

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

IMPORTANT! See boiler controller instruction manual for all the steps necessary to start up for the first time.

8 Decommissioning

8.1 Mothballing

The following measures should be taken if the boiler is to remain out of service for several weeks (e.g. during the summer):

❒ Clean the boiler thoroughly and close the doors fully

If the boiler is to remain out of service during the winter:

❒ Have the system completely drained by a qualified technician

↳ Protection against frost

8.2 Disassembly

To disassemble the system, follow the steps for assembly in reverse order.

8.3 Disposal

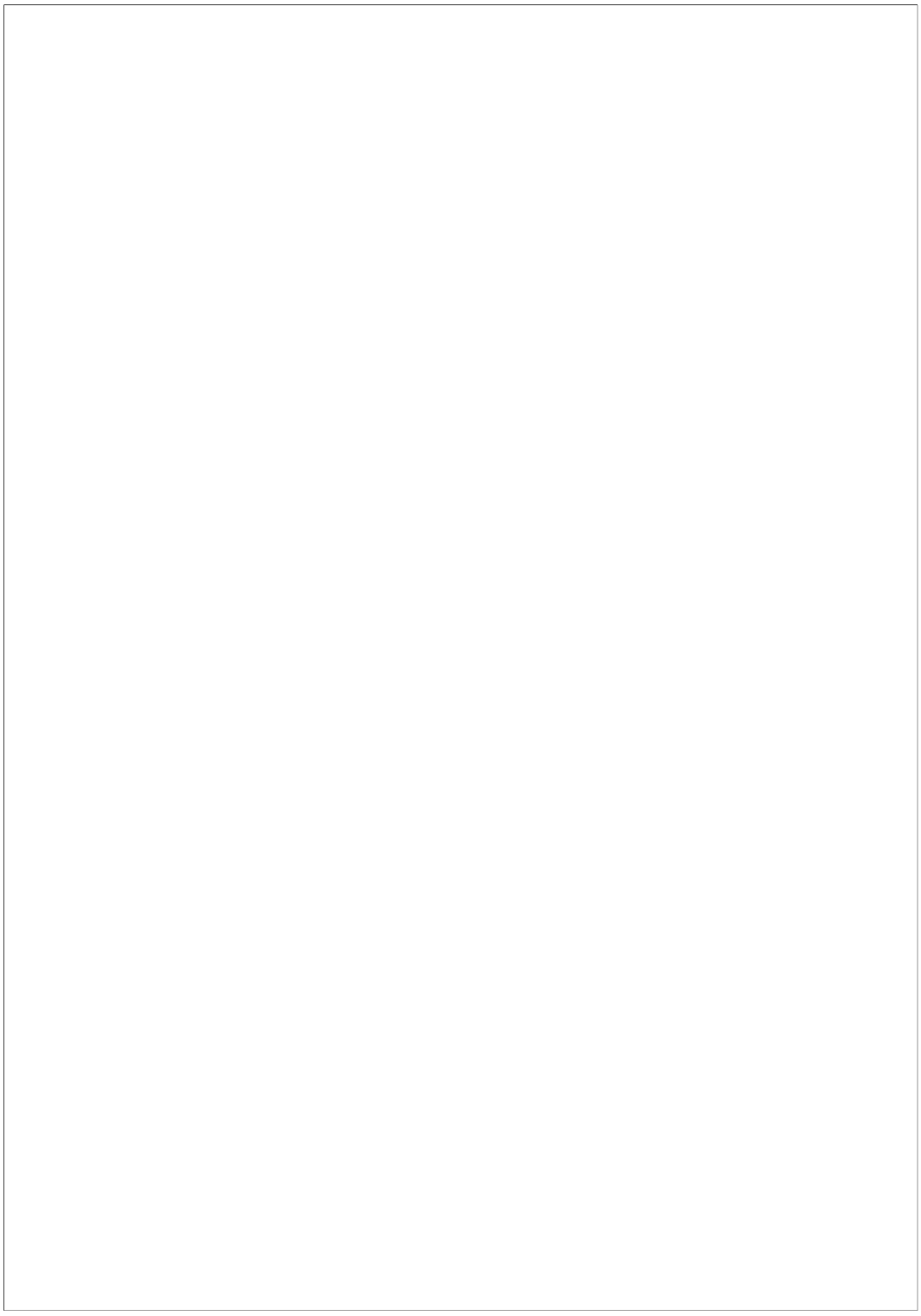
❒ Ensure that they are disposed of in an environmentally friendly way in accordance with waste management regulations in the country (e.g. AWG in Austria)

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

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

9 Appendix

9.1 Pressure equipment regulation



Manufacturer's address

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