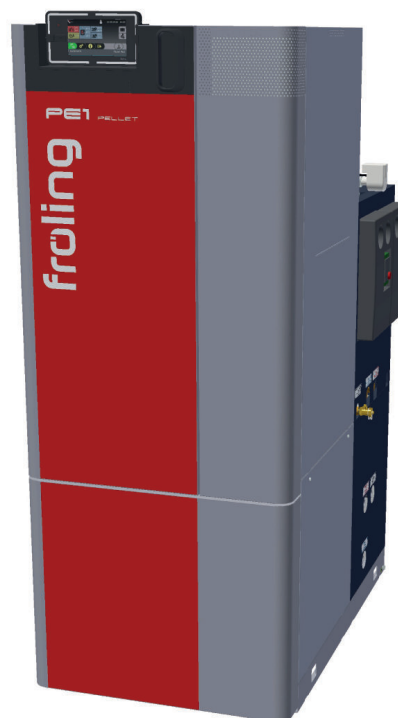


## Installation Instructions

### Pellet boiler PE1 Pellet 7-35 / PE1 Pellet Unit 7-20



PE1 Pellet 7-35



PE1 Pellet Unit 7-20

Translation of the original German installation instructions for technicians

Read and follow the instructions and safety information!

Technical changes, typographical errors and omissions reserved!

M1441420\_en | Edition 10/01/2020



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## 1 General

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

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

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

## 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.*

#### NOTICE

*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

**Assembly and installation by unqualified persons:**

***Risk of personal injury and damage to property***

During assembly and installation:

- ☐ Observe the instructions and information in the manuals
- ☐ Only allow appropriately qualified personnel to work on the system

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

- Heating technician / building technician
- Electrical installation technician
- 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.



- For transportation, setup and assembly:
  - suitable work wear
  - protective gloves
  - sturdy shoes (min. protection class S1P)

## 3 Design Information

### 3.1 Notes on standards

The system must be installed and commissioned 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 M 7137	Compressed untreated wood – Requirements for storing pellets at the end customer's site
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

## 3.2 Installation and approval of the heating system

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

**NOTICE! Each 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 General information for installation room (boiler room)

### Boiler room characteristics

- The floor must be even, clean and dry and have an adequate load-bearing capacity.
- There must not be a potentially explosive atmosphere in the boiler room as the boiler is not suitable for use in potentially explosive environments.
- The boiler room must be frost-free.
- The boiler does not provide any light, so the customer must ensure sufficient lighting in the boiler room in accordance with national workplace design regulations.
- When using the boiler above 2000 metres above sea level you should consult the manufacturer.
- Danger of fire due to flammable materials.  
The floor of the boiler room must not be flammable. No flammable materials should be stored near the boiler. Flammable objects (e.g. clothing) must not be put on the boiler to dry.
- Damage due to impurities in combustion air.  
Do not use any solvents or cleaning agents containing chlorine and hydrogen halides in the room where the boiler is installed (e.g. chlorination units for swimming pools).
- Keep the air suction opening of the boiler free of dust.
- The system must be protected against the chewing or nesting of animals (e.g. rodents etc.).

### Ventilation of the boiler room

Ventilation air for the boiler room should be taken from and expelled directly outside, and the openings and air ducts should be designed to prevent weather conditions (foliage, snowdrifts, etc.) from obstructing the air flow.

Unless otherwise specified in the applicable building regulations for the boiler room, the following standards apply to the design and dimensions of the air ducts:

**Note on standards**

ÖNORM H 5170 - Construction and fire protection requirements  
TRVB H118 - Technical directives on fire protection/prevention

### 3.4 Requirements for central heating 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	:	UNI 8065
		Italy:	

Observe the standards and also follow the recommendations below:

- ☐ Aim for a pH value of 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
- ☐ 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 make-up water, always bleed the filling hose before connecting, in order to prevent air from entering the system

**Advantages of prepared water:**

- Complies with the applicable 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

**Permitted water hardness for the fill and make-up water in accordance with VDI 2035:**

Overall heat output	Total hardness at <20 l/kW minimum individual heat output <sup>1)</sup>		Total hardness at >20 ≤50 l/kW minimum individual heat output <sup>1)</sup>		Total hardness at >50 l/kW minimum individual heat output <sup>1)</sup>	
kW	°dH	mol/m³	°dH	mol/m³	°dH	mol/m³
≤50	no demand or		11.2	2	0.11	0.02
	<16.8 <sup>2)</sup>	<3 <sup>2)</sup>				
>50 ≤200	11.2	2	8.4	1.5	0.11	0.02
>200 ≤600	8.4	1.5	0.11	0.02		
>600	0.11	0.02				

1. From specific system volume (litres nominal capacity/heat output; for multi-boiler systems use the smallest individual heat output)  
2. In the case of systems with central heating boilers and for systems with electric heating elements

**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
- Yearly. Values must be recorded by the owner



### 3.5 Notes for using pressure maintenance systems

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

#### *Compressor-controlled pressure maintenance*

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

#### *Pump-controlled pressure maintenance*

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

### 3.6 Use with storage tank

#### NOTICE

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

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

⇒ See "Addresses" [page 72]

### 3.7 Chimney connection/chimney system



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

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

The connection between the boiler and the chimney system should be as short as possible. The upward angle of the connection should not exceed 30 - 45°. Insulate the connection. The entire flue gas system - chimney and connection - should be calculated in accordance with EN 13384-1.

Local regulations and other statutory regulations also apply.

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

**NOTICE!** TRVB H 118 (Austria only) stipulates that an explosion flap must be installed in the connecting piece (flue pipe) directly next to the boiler. It should be situated in such a way that it poses no risk to persons!

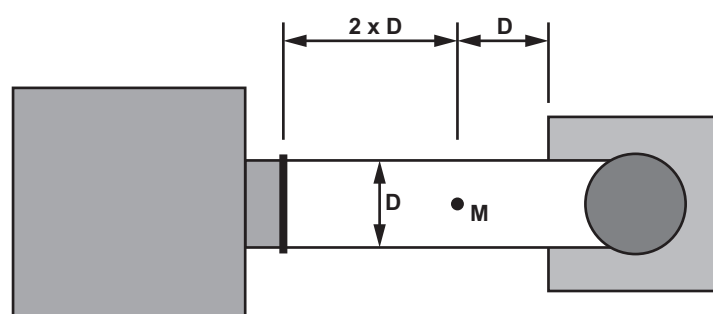
### 3.7.1 Draught limiter

We generally recommend the installation of a draught limiter. A draught limiter must be installed if the maximum permissible feed pressure as given in the boiler data for planning the flue gas system is exceeded.

**NOTICE! Install the draught limiter directly under the mouth of the flue line, as the pressure is constantly low at this point.**

### 3.7.2 Measuring port

For measuring the emissions of the system, a suitable measuring port must be installed in the connecting piece between the boiler and chimney system.



In front of the measuring port (M) a straight inlet section should be located at a distance corresponding to about twice the diameter (D) of the connecting piece. A straight outlet section at a distance corresponding to about the single diameter of the connecting piece should be provided after the measuring port. 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.

## 3.8 Room air-independent operation

The PE1 Pellet has a central air connection on the back of the boiler. If appropriate supply air and flue gas connections are installed, the boiler can be classified according to EN 15035 as a type C<sub>42</sub> / type C<sub>82</sub> or according to DIBt as a type FC<sub>42x</sub> / type FC<sub>52x</sub>.

The conditions for room air-independent operation of the boiler at the installation site must be clarified with the local authority responsible (authority, chimney sweep, ...).

#### *Definitions as per EN 15035*

**Type C<sub>4</sub>** Boiler that is connected via its combustion air supply and flue gas outlet, with a connecting piece that may be supplied, to a shared chimney with a shaft for combustion air supply and a shaft for flue gas outlet. The mouths of the air and flue gas chimney are either concentric or so close to each other that similar wind conditions apply.

**NOTICE! Air is supplied by an air and flue gas system!**

**Type C<sub>8</sub>** A boiler that is connected via its combustion air supply and flue gas outlet, with a connecting piece, to a wind protection device and a single or shared chimney.

**NOTICE!** Air supply via an air supply line that is independent from the chimney system!

**NOTICE!** This design requires a wind protection device. If a protective grating is fitted, you must ensure that the mesh size is sufficiently large to prevent a significant loss of pressure and/or seal from dirt!

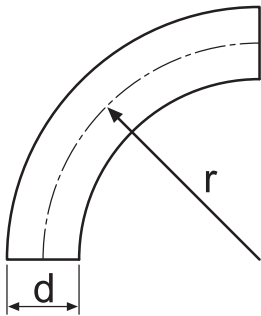
The second index "2" (C<sub>42</sub> / C<sub>82</sub>) indicates type C boilers with a blower fan downstream of the combustion chamber or the heat exchanger.

#### Definitions as per DIBt

**Type FC<sub>42x</sub>** One appliance with flue gas fan for connection to an air/flue system. The combustion air line from the air shaft and the connecting piece to the chimney are part of the appliance.

**Type FC<sub>82x</sub>** One appliance with flue gas fan for connection to a chimney. The combustion air line from the air shaft and the connecting piece to the chimney are part of the appliance.

When dimensioning pipe bends in the supply air line you should note that:



The ratio of the radius of curvature (r) to pipe diameter (d) should be greater than 1

$$r:d \geq 1$$

For example:

- Diameter of supply air connection = 60 mm
- Minimum radius of pipe bends = 60 mm

Install the supply air line in as straight a line as possible and over the shortest path. Keep the number of pipe bends to a minimum.

In addition, the following applies: The maximum resistance of the supply air line is 20 Pa!

You can find the necessary dimensions of the supply air connections in the boiler in the technical data sheets.

### 3.9 Air supply in the installation room

The system is operated in open flue mode, i.e. the combustion air required to operate the pellet boiler is drawn from the installation room.

#### Requirements for the supply of combustion air to the installation room:

- Observe the following at the combustion air opening leading outside:
  - Weather conditions must not affect the air flow in any way (e.g. snow and foliage)
  - The free cross-sectional area must be maintained taking into account e.g. covering grid plates, slats, etc.

- If air lines exceed 2 m or if the combustion air is discharged mechanically, the flow rate must be calculated (maximum flow rate = 1 m/s)

**NOTICE! Observe the standards cited in these instructions as well as other national and local regulations!**

⇒ [See "Note on standards" \[page 8\]](#)

### 3.10 Note on installing an external combustion air supply

**NOTICE!** Install the combustion air supply (piping) in accordance with the applicable standards

⇒ See "Notes on standards" [page 8]

- ☐ Connect supply air duct to the connection provided (external combustion air) on the pellet boiler and make sure that it is properly sealed.

#### *Condensation*

Supply air ducts are normally led along cellar ceilings to the appliance. The temperature difference between the cold air drawn from outside and the room temperature inside the building shell inevitably results in condensation, usually at the unprotected metal air lines.

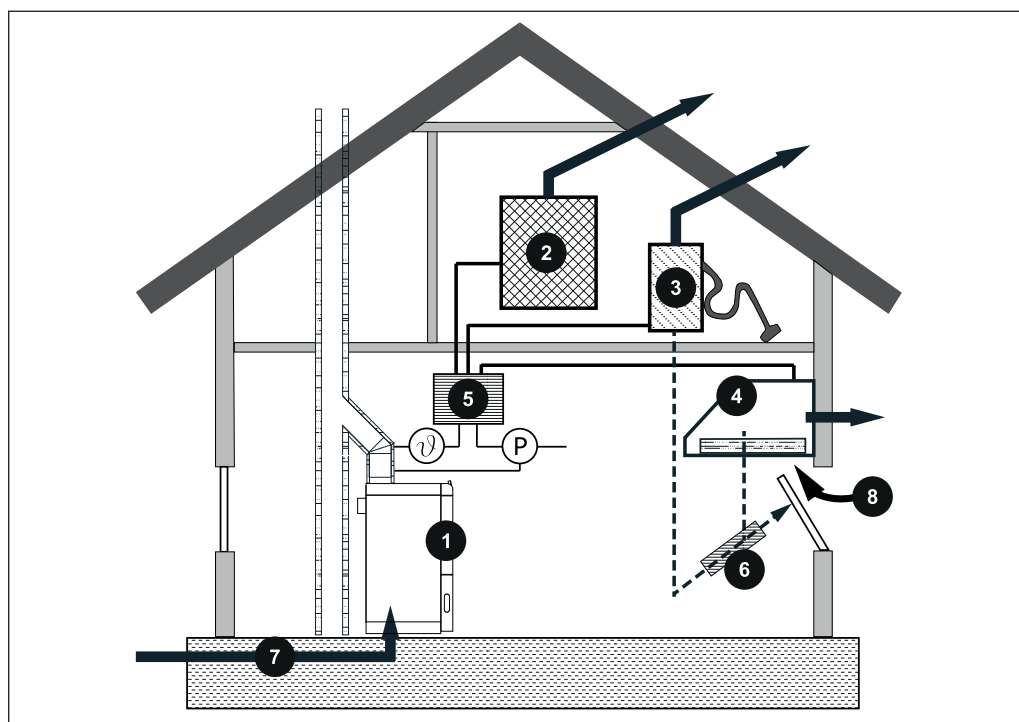
**NOTICE!** The greater the temperature difference between the outside air temperature and room temperature, the greater the risk of condensation

In Germany, the following additional requirement must be observed: The lines must be installed with an incline making sure that any condensation water can drain away and the outside air can be drawn in without allowing water or animals from entering the building.

To avoid condensation:

- ☐ Line the supply air duct with sufficient heat insulation
  - Depends on the average room temperature and the temperature of the outside air, as well as the local conditions
  - The surface temperature must be higher than the room temperature's dew point even in unfavourable weather conditions (cold winters)

### 3.11 Simultaneous operation with other air-drawing systems (room ventilation, cooker hood, centralised dust extraction system, etc.)



1 PE1 Pellet	5 Under-pressure monitoring system <sup>1)</sup>
2 Room ventilation	6 Window-tilting switch/drive system <sup>2)</sup> (installed by customer)
3 Centralised dust extraction system	7 Combustion air supply from outside
4 Cooker hood with extraction mode	8 Outside air

1. An under-pressure monitoring system switches air-drawing systems (e.g. room ventilation, etc.) off when the under-pressure in the installation room exceeds a certain limit. This prevents a reversal of the combustion gas flow in the chimney and thus smoke from being sucked back into the installation room.

2. A window-tilting switch prevents major air-drawing systems (e.g. 3 or 4) from operating with the window closed. A drive system tilts the window open when air-drawing systems (e.g. 3 or 4) are in operation. This prevents a reversal of the combustion gas flow in the chimney and thus smoke from being sucked back into the installation room.

**The following applies if the appliance is to be operated in conjunction with other air-drawing systems:**

- ☐ The possibility of simultaneous operation of appliance and other air-drawing systems (e.g. room ventilation) must be clarified in advance with the responsible chimney sweep
- ☐ Observe the chimney sweep's assessment criteria
  - These apply until an appropriate regulation has been published
- ☐ Only use approved safety equipment (e.g. under-pressure monitoring system and/or window-tilting switch with DIBt certification [DE])
- ☐ Make sure that the combustion air supply line and the connecting piece are properly sealed at the chimney. Any flexible aluminium pipes used for the supply air line must be protected against mechanical loads.

### 3.11.1 Room air-independent appliance

The pellet boiler is suitable for room air-independent operation up to a maximum permissible room-side under-pressure of 8 Pa. Provided the permissible room-side under-pressure limit is not exceeded, there are no restrictions regarding simultaneous operation of air-drawing systems (e.g. with a room ventilation system). If the under-pressure in the installation room is higher than the permissible under-pressure limit, the appliance is classified as room air-dependent and must be equipped with a safety system (under-pressure monitoring system).

**In Germany, the following additional requirement must be observed:** An under-pressure monitoring system approved according to DiBt (e.g. P4 air pressure alarm) must be fitted. This system must monitor the maximum under-pressure of 4 Pa in the installation room.

### 3.11.2 Room air-dependent appliance

In the case of room air-dependent appliances, some restrictions apply regarding simultaneous operation of air-drawing systems (e.g. with a room ventilation system, etc.). Safety equipment is required in these cases.

**As a basic rule:**

- When operating air-drawing systems (e.g. room ventilation, etc.) simultaneously with a room air-dependent appliance, the room-side under-pressure must not exceed 4 Pa.

In addition, at least one of the following three requirements must be met:  
(Source: Section 4 MFeuV 2007 / 2010)

- Use safety equipment that prevents simultaneous operation of appliance and other air-drawing systems

*OR*

- Monitor the extraction of the flue gas using special safety equipment

*OR*

- Make sure that the outside air lines required for the appliance are isolated from the outside air lines required for the ventilation system. This ensures that no dangerous under-pressure can develop while operating the appliance.

***Simultaneous operation***

A safety system must ensure that no dangerous under-pressure can develop when the systems are operated simultaneously. In the event of a fault, the safety system will switch off one of the air-drawing systems (e.g. the room ventilation system, etc.).

***Alternating operation***

An approved safety system (e.g. based on under-pressure or temperature readings) must ensure that the air-drawing system and the appliance cannot be operated at the same time. Any further processing of the signals must also comply with this safety philosophy. Shutting down the power supply is permitted and sufficient.



### 3.11.3 Requirements for operating the room air-dependent appliance simultaneously with an air-drawing system (e.g. with a room ventilation system, centralised dust extraction system, etc.)

- ☐ Ensure there is a sufficient supply of combustion air
  - ➔ Install external combustion air supply
- ☐ Use safety systems, e.g. an under-pressure monitoring system, window-tilting drive system or window-tilting switch, etc.

#### Recommendation for room ventilation systems:

- ☐ Use fail-safe room ventilation systems with F classification

**NOTICE!** Cooker hoods with recirculation mode do not need to meet any special requirements

## 3.12 Boiler ventilation



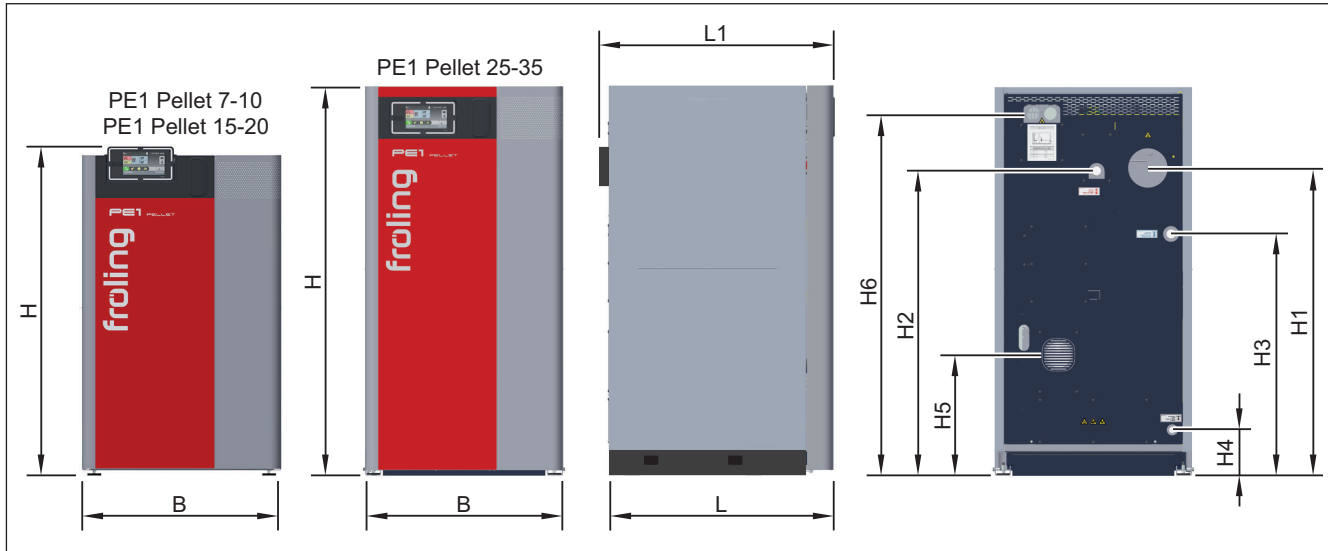
- ☐ Fit the automatic ventilating valve at the highest point on the boiler or at the ventilation connection (if present).
  - ➔ This ensures that air in the boiler is constantly expelled, thus preventing malfunctions caused by air in the boiler
- ☐ Check that the boiler ventilation is working properly
  - ➔ 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!

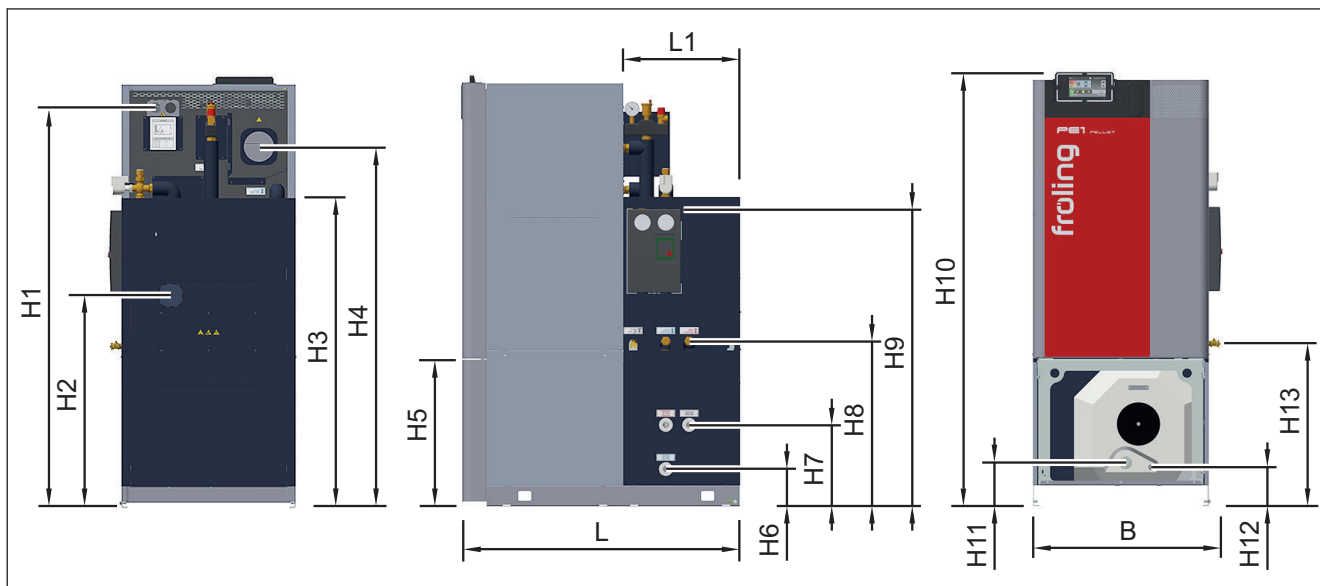
## 4 Technology

### 4.1 Dimensions - PE1 Pellet 7-35



Dimension	Description	Unit	PE1 Pellet		
			7 - 10	15 - 20	25 - 35
<b>L</b>	Length of boiler	mm	690	690	850
<b>L1</b>	Total length incl. flue pipe connection		760	740	890
<b>B</b>	Width of boiler		650	750	750
<b>H</b>	Height, boiler		1240	1240	1480
<b>H1</b>	Height, flue pipe connection		940	940	1170
<b>H2</b>	Height, flow connection		930	930	1160
<b>H3</b>	Height, return connection		750	750	920
<b>H4</b>	Height of drainage connection		95	95	175
<b>H5</b>	Height of supply air connection (for room air-independent operation)		390	390	460
<b>H6</b>	Height of suction system connection		1110	1110	1380

## 4.2 Dimensions - PE1 Pellet Unit 7-20



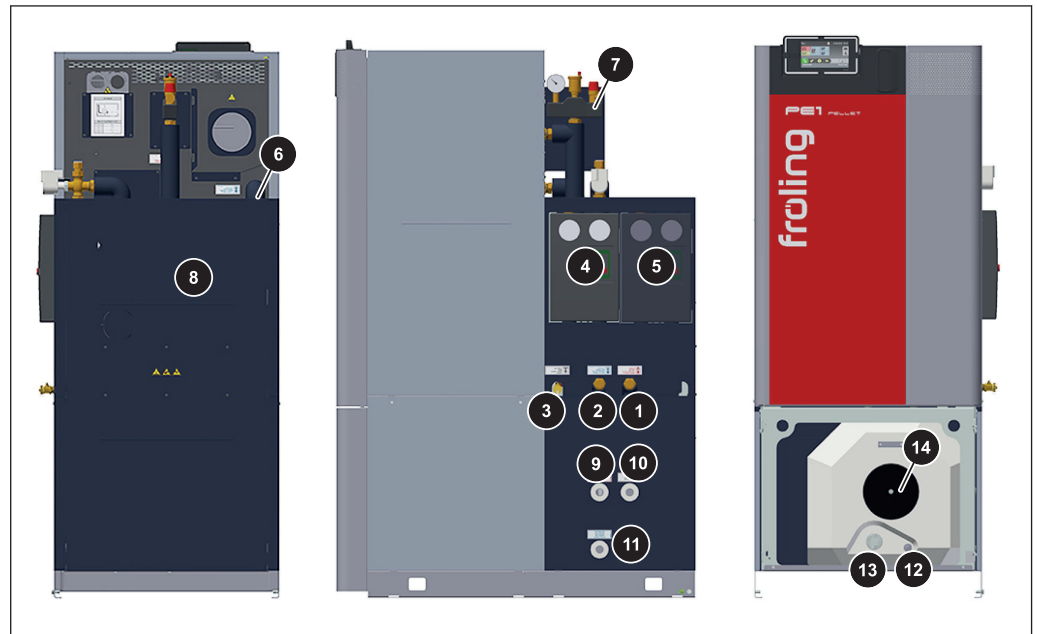
Dimension	Description	Unit	PE1 Pellet	
			7 - 10	15 - 20
<b>L</b>	Length, PE1 Pellet Unit	mm	1150	1150
<b>L1</b>	Length, hydraulic unit		500	500
<b>B</b>	Width, PE1 Pellet Unit		660	810
<b>H1</b>	Height of suction system connection		1720	1720
<b>H2</b>	Height, supply air connection (for room air-independent operation)		980	970
<b>H3</b>	Height, hydraulic unit		1330	1330
<b>H4</b>	Height, flue pipe connection		1570	1550
<b>H5</b>	Height, DHW tank unit		630	630
<b>H6</b>	Height, cold water supply of the boiler		160	160
<b>H7</b>	Height, hot water/circulation connection of the boiler		350	350
<b>H8</b>	Height of flow/return connection of the boiler		710	710
<b>H9</b>	Height of flow/return connection of the heating circuits		1260	1260
<b>H10</b>	Height, PE1 Pellet Unit		1810	1810
<b>H11</b>	Height, electronic heating cartridge connection		185	185
<b>H12</b>	Height, drainage connection of DHW tank		165	165
<b>H13</b>	Height of the drainage connection of the boiler		690	690

### 4.3 Connections - PE1 Pellet 7-35



No.	Description	Unit	PE1 Pellet		
			7-10	15-20	25-35
1	Boiler flow connection	Inches	3/4 IT	1 IT	
2	Boiler return connection		3/4 IT	1 IT	
3	Drainage connection		1/2 IT		
4	Supply air connection (external diameter)	mm	80		100
5	Flue pipe connection		99 <sup>1)</sup>	129	149
6	Pellet suction line connection		50		
7	Return-air line connection		50		
1. Optional flue gas diameter of 129 mm without additional connecting adapter possible					

## 4.4 Components and connections - PE1 Pellet Unit 7-20



No.	Description	Unit	PE1 Pellet	
			7-10	15-20
1	System expansion flow connection	Inches	1 IT	
2	System expansion return connection		1 IT	
3	Drainage connection (with optional hydraulic unit designed as a boiler filling and drainage system)		1/2 IT	
4	Flow and return connection for heating circuit 1 (heating circuit group with high efficiency pump and mixing valve)		1 ET	
5	Flow and return connection for additional heating circuit group		1 IT	
6	Line regulating valve			
7	Safety group with pressure gauge for system pressure, quick vent valve and safety valve			
8	Expansion tank (in hydraulic block)	Litres	18	24
9	Connection, hot water for the DHW tank	inches	3/4 ET	
10	Connection, circulation line		3/4 ET	
11	Cold water supply for DHW tank		3/4 ET	
12	Drainage connection for the DHW tank (boiler filling and drainage system are not included in delivery)		1/2 IT	
13	Connection for E-cartridge		6/4 IT	
14	Maintenance flange with insulated magnesium protective anode			

## 4.5 Technical specifications

### 4.5.1 PE1 Pellet 7-10 / PE1 Pellet Unit 7-10

Description		PE1 Pellet 7	PE1 Pellet 10
Nominal output	kW	7	10
Output range		2 - 7	2 - 10
Electrical connection		230V / 50Hz / fused C16A	
Power consumption <sup>1)</sup>	W	43	50
Boiler weight	kg	approx. 200	approx. 200
Total boiler capacity (water)	l	approx. 25	approx. 25
Pellet container capacity		35	35
Ash box capacity		14.5	14.5
Water pressure drop ( $\Delta T = 20\text{ K}$ )	mbar	0.8	2.1
Permitted operating pressure (hot water)	bar	3	3
Minimum boiler return temperature		Not applicable due to internal return temperature control	
Maximum boiler temperature setting	°C	90	
Minimum boiler temperature setting		40	
Permitted operating temperature		95	
Airborne sound level	dB(A)	< 70	
Boiler class as per EN 303-5:2012		5	
Permitted fuel		Fuel as per EN ISO 17225 – Part 2: wood pellets Class A1 / D06	
Test book number		PB0710015	PB0720015
1. The technical specifications of the optional components can be found in the enclosed supplier documentation			

Regulation (EU) 2015/1187			
Energy efficiency class of boiler		A+	A+
Energy efficiency index (EEI) of boiler		112	113
Heating space annual rate of use $\eta_s$	%	75	76
Energy efficiency index (EEI) of boiler and controller combined		114	115
Energy efficiency class (EEI) of boiler and controller combined		A+	A+

Regulation (EU) 2015/1189 - Emissions in [mg/m <sup>3</sup> ] <sup>1)</sup>	
seasonal space heating emissions of particulate (PM)	≤ 40
seasonal space heating emissions of organic gaseous compounds (OGC)	≤ 20
seasonal space heating emissions of carbon monoxide (CO)	≤ 500

Regulation (EU) 2015/1189 - Emissions in [mg/m <sup>3</sup> ] <sup>1)</sup>	
seasonal space heating emissions of nitrogen oxides (NO <sub>x</sub> )	≤ 200
1. Emissions of particulate matter, organic gaseous compounds, carbon monoxide and nitrogen oxides shall be expressed standardised to a dry flue gas basis at 10 % oxygen and standard conditions at 0°C and 1013 millibar	

Description		PE1 Pellet 7	PE1 Pellet 10
Heat output boiler element		37.6	37.6
Weight per unit		approx. 415	approx. 415
Total boiler capacity Unit (water)		approx. 37	approx. 37
Boiler domestic hot water content		122	122
Permitted operating pressure (domestic hot water)		6	6
Test over-pressure (domestic hot water)		9	9
Permitted operating temperature (domestic hot water)		110	
Performance indicator as per DIN 4708	NL = 1.2		
Standby heat loss as per EN 15332	Q <sub>B</sub> = 1.24 kWh / 24 h		

#### 4.5.2 PE1 Pellet 15-20 / PE1 Pellet Unit 15-20

Description		PE1 Pellet 15	PE1 Pellet 20
Nominal output	kW	15	20
Output range		4.5 - 15	4.5 - 20
Electrical connection		230V / 50Hz / fused C16A	
Power consumption <sup>1)</sup>	W	43	50
Boiler weight	kg	approx. 250	approx. 250
Total boiler capacity (water)	l	approx. 38	approx. 38
Pellet container capacity		41	41
Ash box capacity		20	20
Water pressure drop (ΔT = 20 K)	mbar	4.0	5.0
Permitted operating pressure (hot water)	bar	3	3
Minimum boiler return temperature		Not applicable due to internal return temperature control	
Maximum boiler temperature setting	°C	90	
Minimum boiler temperature setting		40	
Permitted operating temperature		95	
Airborne sound level	dB(A)	< 70	
Boiler class as per EN 303-5:2012		5	
Permitted fuel		Fuel as per EN ISO 17225 – Part 2: wood pellets Class A1 / D06	
Test book number		PB0730015	PB0740015
1. The technical specifications of the optional components can be found in the enclosed supplier documentation			

Regulation (EU) 2015/1187			
Energy efficiency class of boiler		A+	A+
Energy efficiency index (EEI) of boiler		114	115
Heating space annual rate of use $\eta_s$	%	77	78
Energy efficiency index (EEI) of boiler and controller combined		116	117
Energy efficiency class (EEI) of boiler and controller combined		A+	A+

Regulation (EU) 2015/1189 - Emissions in [mg/m <sup>3</sup> ] <sup>1)</sup>	
seasonal space heating emissions of particulate (PM)	≤ 40
seasonal space heating emissions of organic gaseous compounds (OGC)	≤ 20
seasonal space heating emissions of carbon monoxide (CO)	≤ 500
seasonal space heating emissions of nitrogen oxides (NO <sub>x</sub> )	≤ 200
1. Emissions of particulate matter, organic gaseous compounds, carbon monoxide and nitrogen oxides shall be expressed standardised to a dry flue gas basis at 10 % oxygen and standard conditions at 0°C and 1013 millibar	

Description		PE1 Pellet 15	PE1 Pellet 20
Heat output boiler element		37.6	37.6
Weight per unit		approx. 440	approx. 440
Total boiler capacity Unit (water)		approx. 50	approx. 50
Boiler domestic hot water content		122	122
Permitted operating pressure (domestic hot water)		6	6
Test over-pressure (domestic hot water)		9	9
Permitted operating temperature (domestic hot water)		110	
Performance indicator as per DIN 4708		NL = 1.6	
Standby heat loss as per EN 15332		Q <sub>B</sub> = 1.24 kWh / 24 h	

#### 4.5.3 PE1 Pellet 25-30

Description		PE1 Pellet 25	PE1 Pellet 30
Nominal output	kW	25	30
Output range		7.2 - 25.0	7.2 - 30
Electrical connection		230V / 50Hz / fused C16A	
Power consumption	W	57	63
Boiler weight	kg	approx. 380	approx. 380
Total boiler capacity (water)	l	approx. 60	approx. 60
Pellet container capacity		76	76
Ash box capacity		23	23
Water pressure drop (ΔT = 20K)	mbar	7.0	11.0



Description		PE1 Pellet 25	PE1 Pellet 30
Minimum boiler return temperature		Not applicable due to internal return temperature control	
Maximum boiler temperature setting	°C	90	
Minimum boiler temperature setting		50	
Airborne sound level	dB(A)	< 70	
Boiler class as per EN 303-5:2012		5	
Permitted fuel		Fuel as per EN ISO 17225 – Part 2: wood pellets Class A1 / D06	
Test book number		PB0750015	PB0760015

Regulation (EU) 2015/1187			
Energy efficiency class of boiler		A+	A+
Energy efficiency index (EEI) of boiler		119	119
Heating space annual rate of use $\eta_s$	%	80	81
Energy efficiency index (EEI) of boiler and controller combined		121	121
Energy efficiency class (EEI) of boiler and controller combined		A+	A+

Regulation (EU) 2015/1189 - Emissions in [mg/m <sup>3</sup> ] <sup>1)</sup>	
seasonal space heating emissions of particulate (PM)	≤ 40
seasonal space heating emissions of organic gaseous compounds (OGC)	≤ 20
seasonal space heating emissions of carbon monoxide (CO)	≤ 500
seasonal space heating emissions of nitrogen oxides (NO <sub>x</sub> )	≤ 200
1. Emissions of particulate matter, organic gaseous compounds, carbon monoxide and nitrogen oxides shall be expressed standardised to a dry flue gas basis at 10 % oxygen and standard conditions at 0°C and 1013 millibar	

#### 4.5.4 PE1 Pellet 32-35

Description		PE1 Pellet 32	PE1 Pellet 35
Nominal output	kW	32	35
Output range		7.2 - 32.0	7.2 - 35.0
Electrical connection		230V / 50Hz / fused C16A	
Power consumption	W	64	67
Boiler weight	kg	approx. 380	approx. 380
Total boiler capacity (water)	l	approx. 60	approx. 60
Pellet container capacity		76	76
Ash box capacity		23	23
Water pressure drop (ΔT = 20K)	mbar	12.0	14.0
Minimum boiler return temperature		Not applicable due to internal return temperature control	

Description		PE1 Pellet 32	PE1 Pellet 35
Maximum boiler temperature setting	°C	90	
Minimum boiler temperature setting		50	
Airborne sound level	dB(A)	< 70	
Boiler class as per EN 303-5:2012		5	
Permitted fuel		Fuel as per EN ISO 17225 – Part 2: wood pellets Class A1 / D06	
Test book number		PB0770015	PB0780015

Regulation (EU) 2015/1187			
Energy efficiency class of boiler		A+	A+
Energy efficiency index (EEI) of boiler		119	119
Heating space annual rate of use $\eta_s$	%	81	81
Energy efficiency index (EEI) of boiler and controller combined		121	121
Energy efficiency class (EEI) of boiler and controller combined		A+	A+

Regulation (EU) 2015/1189 - Emissions in [mg/m <sup>3</sup> ] <sup>1)</sup>	
seasonal space heating emissions of particulate (PM)	≤ 40
seasonal space heating emissions of organic gaseous compounds (OGC)	≤ 20
seasonal space heating emissions of carbon monoxide (CO)	≤ 500
seasonal space heating emissions of nitrogen oxides (NO <sub>x</sub> )	≤ 200
1. Emissions of particulate matter, organic gaseous compounds, carbon monoxide and nitrogen oxides shall be expressed standardised to a dry flue gas basis at 10 % oxygen and standard conditions at 0°C and 1013 millibar	

## 4.5.5 Boiler data for planning the flue gas system

Description		PE1 Pellet / PE1 Pellet Unit			
		7	10	15	20
Flue gas temperature at nominal load	°C	140	150	140	150
Flue gas temperature at partial load		100	100	100	100
CO <sub>2</sub> - volume concentration at nominal load / partial load	%	11 / 9			
Flue gas mass flow at nominal load	kg/h	17	25	36	52
	kg/s	0.005	0.007	0.010	0.014
Flue gas mass flow at partial load	kg/h	7	7	16	20
	kg/s	0.002	0.002	0.004	0.006
Required feed pressure at nominal load	Pa	5			
	mbar	0.05			
Required feed pressure at partial load	Pa	2			
	mbar	0.02			
Maximum permissible feed pressure	Pa	30			
	mbar	0.3			
Flue pipe diameter	mm	99 <sup>1)</sup>		129	
Supply air connection for room air-independent operation		80			
Combustion air volume at nominal load	m³/h	14	20	29	39
1. Optional flue gas diameter of 129 mm without additional connecting adapter possible					

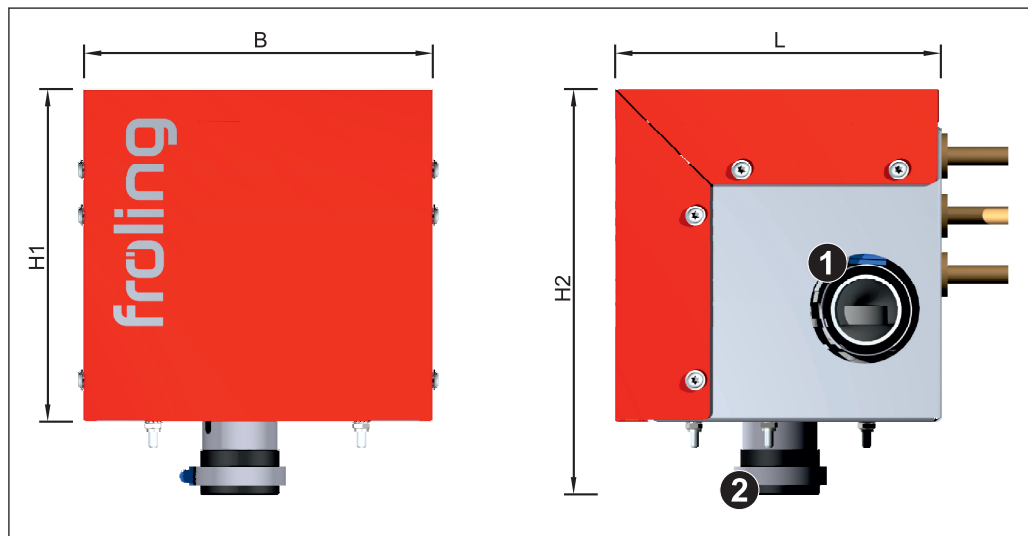
Description		PE1 Pellet			
		25	30	32	35
Flue gas temperature at nominal load	°C	140	150	160	160
Flue gas temperature at partial load		100	100	100	100
CO <sub>2</sub> - volume concentration at nominal load / partial load	%	11 / 9			
Flue gas mass flow at partial load	kg/h	25	30	32	40
	kg/s	0.007	0.008	0.009	0.011
Required feed pressure at nominal load	Pa	5			
	mbar	0.05			
Required feed pressure at partial load	Pa	2			
	mbar	0.02			
Maximum permissible feed pressure	Pa	30			
	mbar	0.3			
Flue pipe diameter	mm	149			
Supply air connection for room air-independent operation		100			
Combustion air volume at nominal load	m <sup>3</sup> /h	49	58	62	68

## NOTICE

In Germany, the following applies:

- ❑ Continuous supply of fuel in the boiler's ideal output range can be achieved by using a storage tank with a minimum volume in accordance with 1. BImSchV. In this case, no chimney calculations are required in partial load.

## 4.6 External suction module



Measurement	Description	Unit	Size 1	Size 2
B	Width of suction module	mm	235	290
L	Length of suction module		220	265
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	Return-air line connection (line to boiler)		50	

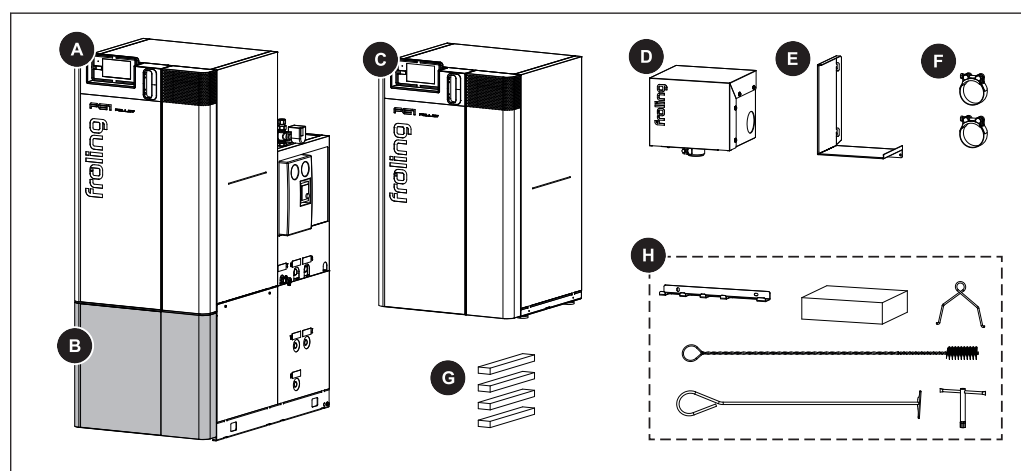
## 5 Assembly

### NOTICE

The individual parts of the boiler insulation covered with a protective film. You must remove the protective film before proceeding with installation.

### 5.1 Included in delivery

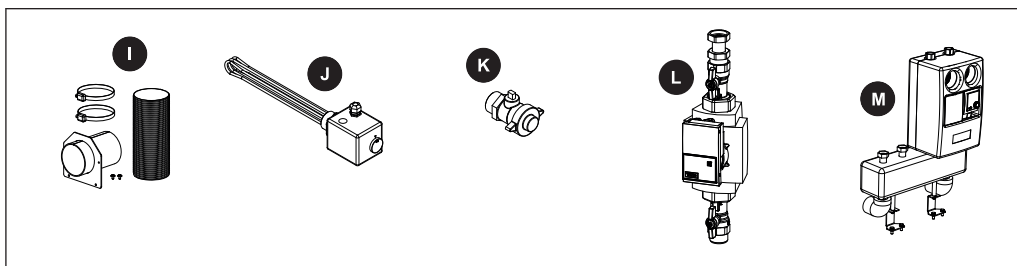
The boiler comes on a pallet together with the suction module and accessories. Some of the components come in cardboard packaging.



<b>A</b> Boiler PE1 Pellet Unit ⇒ See "Install the PE1 Pellet Unit" [page 45]	<b>E</b> Protective plate for flue pipe ⇒ See "Install the protective plate for the flue pipe" [page 62]
<b>B</b> Cover (for PE1 Pellet Unit) ⇒ See "Fit the front cover" [page 54]	<b>F</b> Hose clamps ⇒ See "Connect the suction hoses to the boiler" [page 59]
<b>C</b> Boiler PE1 Pellet Unit ⇒ See "Install PE1 Pellet" [page 39]	<b>G</b> Boiler underlays (for PE1 Pellet Unit) ⇒ See "Align the boiler with the floor" [page 46]
<b>D</b> External suction module ⇒ See "Installing the external suction module" [page 57]	<b>H</b> Accessories (cleaning equipment, socket wrench, mounting bracket (for PE1 Pellet 25-35), controller accessories included in ash container (sensor, immersion sleeve etc.))

Not pictured: installation and operating instructions, guarantee certificate, identification plate

*Optionally available for PE1 Pellet Unit:*



**I** Connection set for operation independent of room air  
⇒ See "Install the connection set for room air-independent operation (optional)" [page 48]

**L** Pipe assembly for storage tank loading  
⇒ See "Expansion with pipe assembly for storage loading (optional)" [page 50]

**J** Electric heating cartridge  
⇒ See "Expansion with electronic heating cartridge (optional)" [page 48]

**M** Pump assembly for second heating circuit  
⇒ See "Expansion with pump assembly for second heating circuit (optional)" [page 51]

**K** Boiler filling and drainage system  
⇒ See "Install boiler filling and drainage system" [page 47]

## 5.2 Tools required



The following tools are required for assembling the boiler and suction module:

- Spanner or box wrench set
- Set of Allen keys
- Flat head and cross-head screwdrivers
- Pipe wrench or water pump pliers (1")
  - We recommend the use of a plier wrench for the flat-sealing joints of the PE1 Pellet Unit.
- Cordless screwdriver and set of Torx bits (T20, T25, T30)
- Power drill with masonry drill bit Ø12 mm

## 5.3 Transport

The product is delivered on pallet(s) in cardboard packaging.



### NOTICE

#### Possibility of damage to components if handled incorrectly

- ☐ Follow the transport instructions on the packaging
- ☐ Transport components with care to avoid damage
- ☐ Protect components against damp
- ☐ Pay attention to the pallet's centre of gravity when lifting

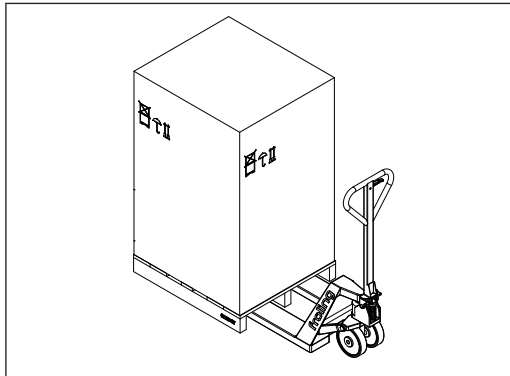
## 5.4 Positioning

If the height of the PE1 Pellet Unit prevents it from being transported as a single unit:

- ☐ ⇒ See "Disassembling to make transporting the PE1 Pellet Unit easier" [page 55]

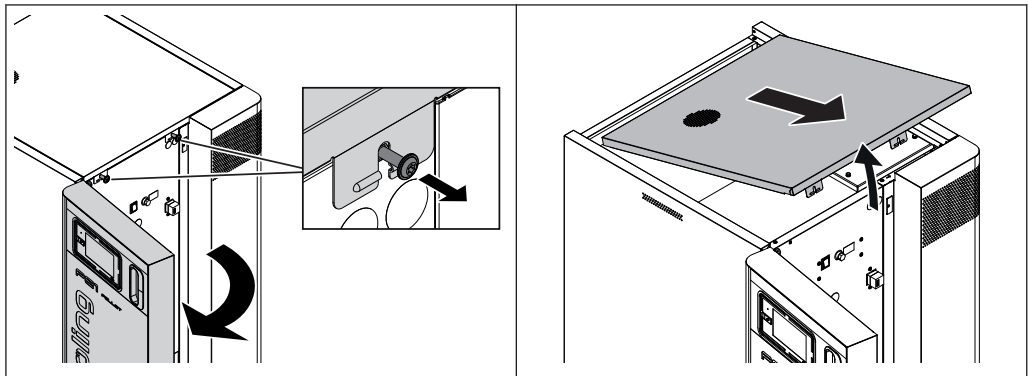
**NOTICE!** Only remove the PE1 Pellet Unit as a last resort if it cannot be transported as a single unit!

*Transport with fork-lift or similar lifting device*



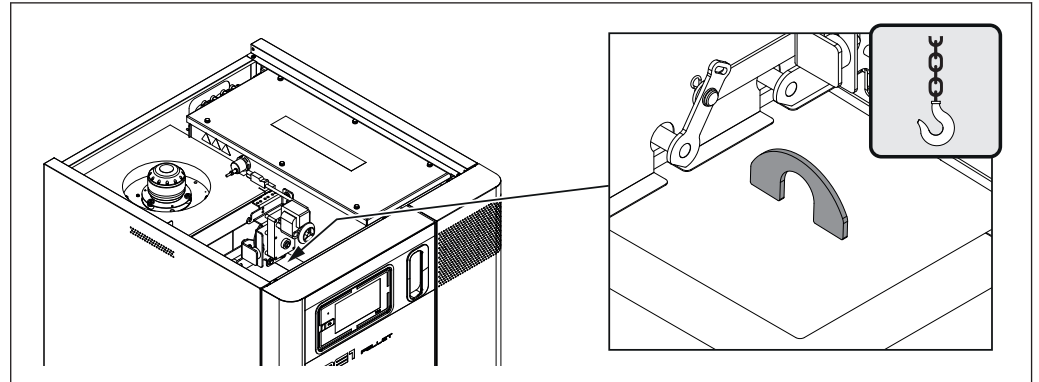
- ☐ Position a fork-lift or similar lifting device at the pallet and bring in the components

*Positioning using a crane:*



- ☐ Open the insulated door
- ☐ Unlock the cover by undoing the retaining screws
- ☐ Lift the cover on the front edge slightly and remove it towards the front





- ☐ Transport the boiler using a crane hook

**NOTICE!** The PE1 Pellet Unit can also be transported on the crane hook. However, it is then imperative to check that all of the pre-installed pipe connections are properly in position and leak-tight!

## 5.5 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!

## 5.6 Setting up in the boiler room

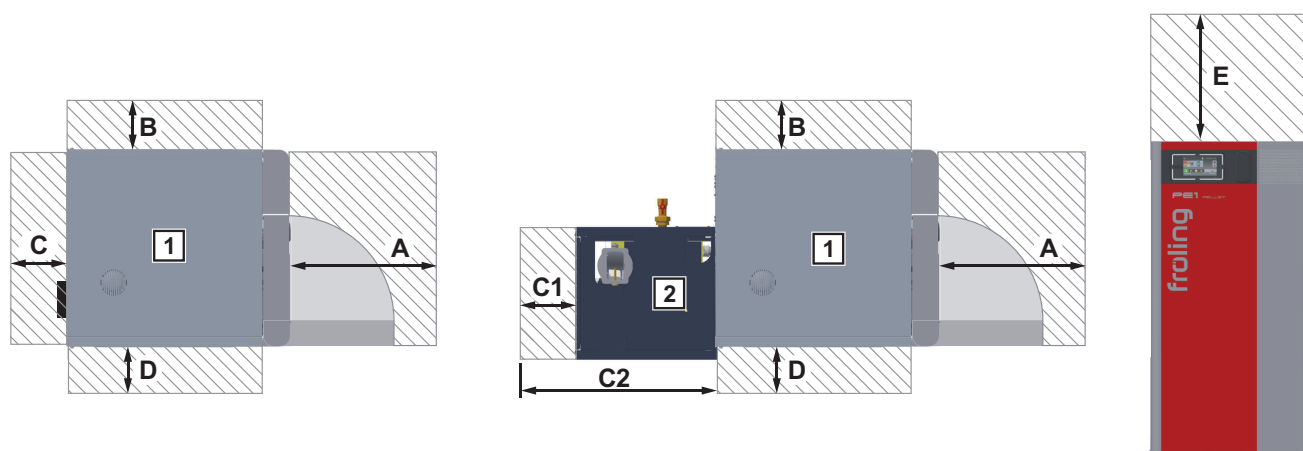
### 5.6.1 Moving the boiler in the boiler room

- ❑ Position a forklift or similar lifting device with a suitable load-bearing capacity at the base frame
- ❑ Lift and transport to the intended position in the installation room.
  - Pay attention to the operating and maintenance areas of the equipment in the process!

### 5.6.2 Operating and maintenance areas of the equipment

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

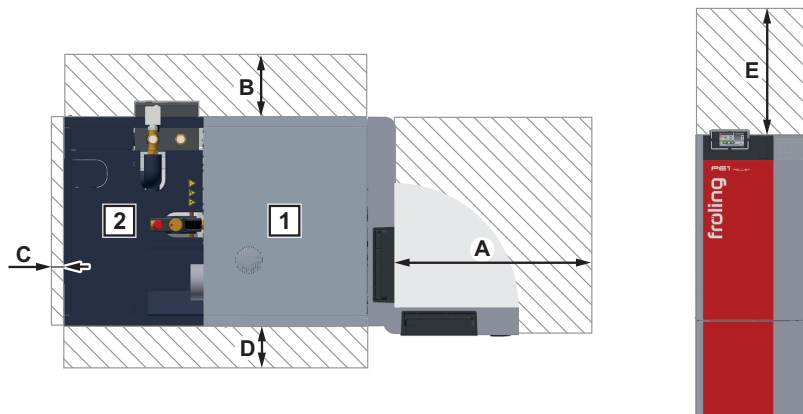
#### *Operating and maintenance areas of the PE1 Pellet*



1 ... PE1 Pellet pellet boiler / 2 ... Condensing boiler heat exchanger

	PE1 Pellet 7-20	PE1 Pellet 25-35
A	600 mm	
B	300 mm	
C	300 mm	
C1	250 mm	
C2	750 mm	790 mm
D	100 mm	
E	500 mm <sup>1)</sup>	
1. Maintenance area to expand the WOS springs upwards		

### Operating and maintenance areas of the PE1 Pellet Unit

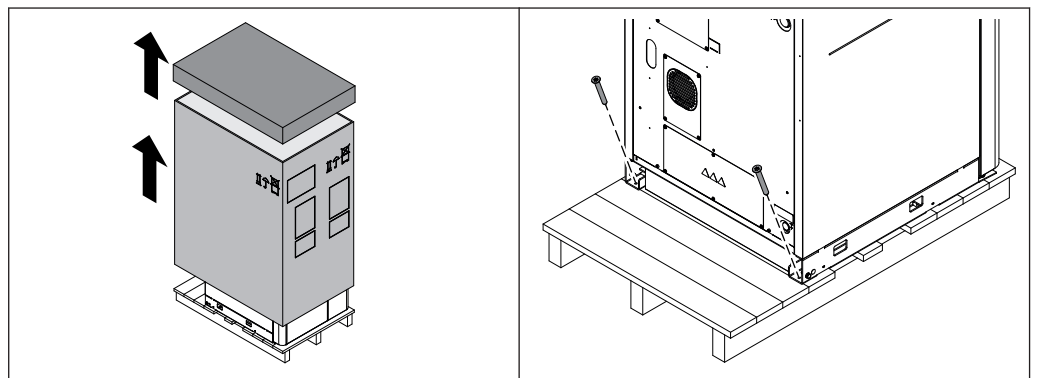


1 ... PE1 Pellet Unit pellet boiler / 2 ... Condensing boiler heat exchanger

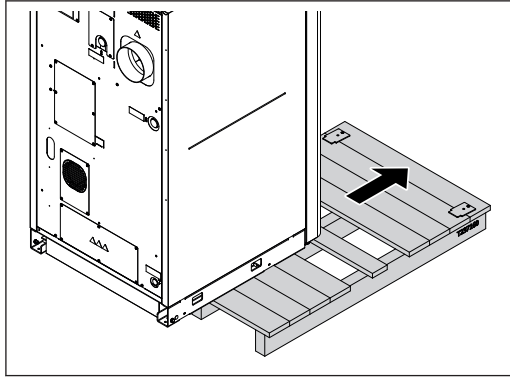
A	600 mm
B	300 mm
C	30 mm
D	100 mm
E	500 mm <sup>1)</sup>
1. Maintenance area to expand the WOS springs upwards	

## 5.7 Install PE1 Pellet

### 5.7.1 Remove boiler from pallet



- ☐ Cut through the reinforcing tape and lift off the cardboard box
- ☐ Take the components behind the boiler (suction module, furnace tool,...) off the pallet
- ☐ Remove the transport lock at the back of the boiler



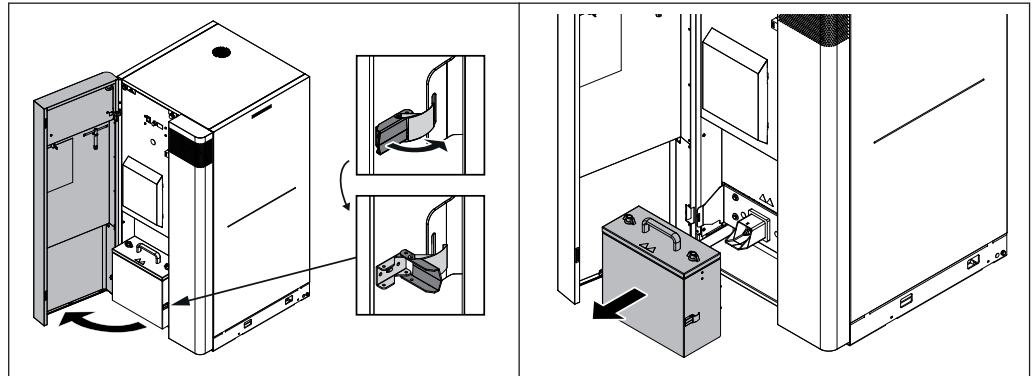
- ☐ Lift the boiler and pull the pallet out the front

TIP: We recommend using Froling's KHV 1400 boiler lifting system to make pallet removal easier

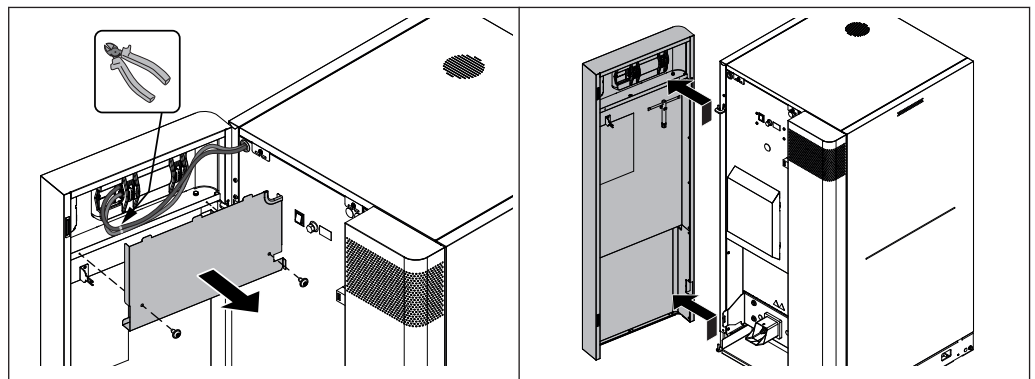


### 5.7.2 PE1 Pellet 25-35 – Prepare the boiler for transport and setup

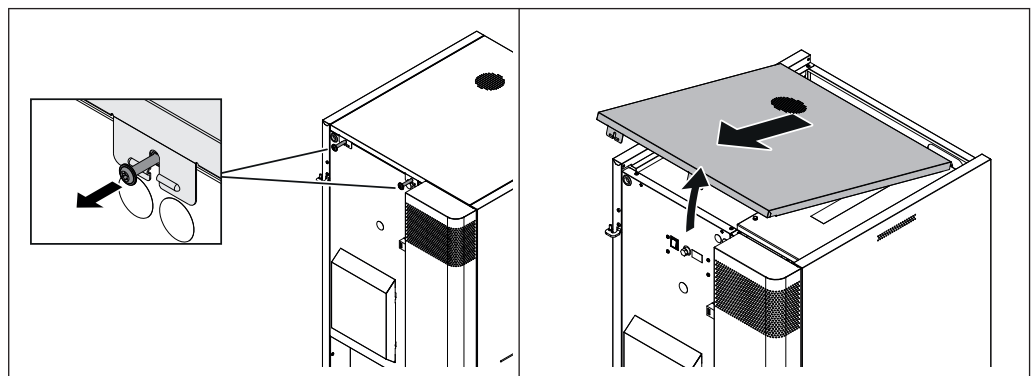
The following preparations are necessary in order to remove the PE1 Pellet 25-35 from the pallet with the Froling KHV 1400 boiler lifting system and transport it with a forklift or similar lifting device.



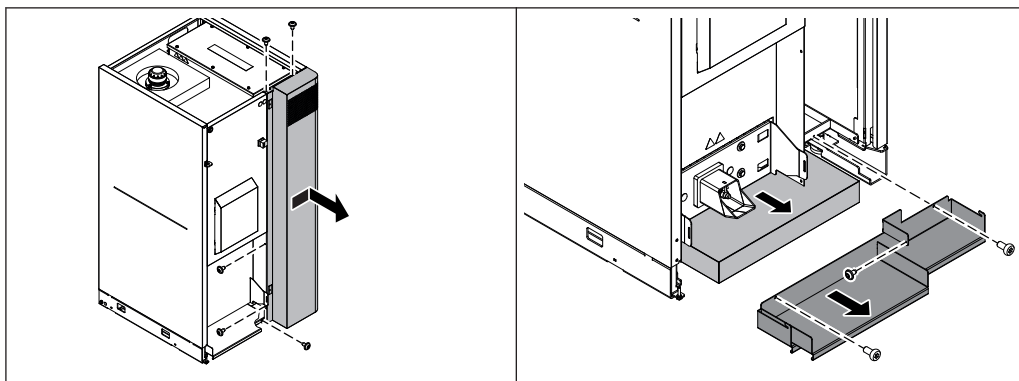
- ☐ Open the insulated door
- ☐ Release the clamps and remove from the ash container from the boiler



- ☐ Remove the cover plate on the inside of the insulated door
- ☐ Remove cable ties and unplug both display cables  
**TIP:** Uniquely identify the cables (top bushing: BUS, bottom bushing: ETHERNET)
- ☐ Remove insulated door



- ☐ Unlock the cover by undoing the retaining screws
- ☐ Lift the cover on the front edge slightly and remove it towards the front



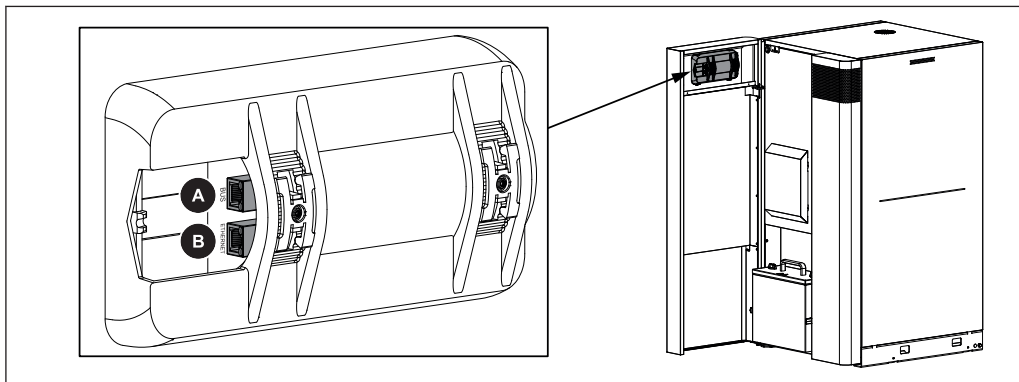
- ☐ Undo the screws on the front cover plate
- ☐ Unlock cover plate to the right and lift off to the front
- ☐ Remove the protective plate from the bottom of the boiler
- ☐ Pull out floor insulation

The Froling KHV 1400 boiler lifting system can now be used to lift the boiler off the pallet and the boiler can be transported using a forklift or similar lifting device.

Assemble all components in reverse order.

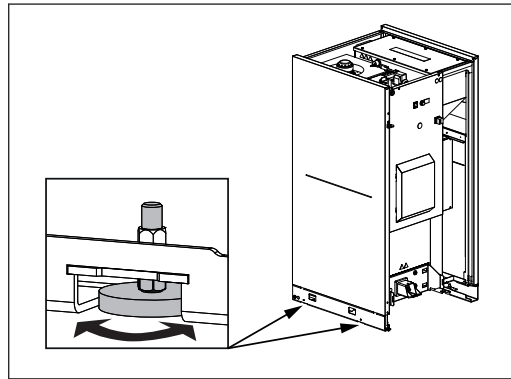
**IMPORTANT: Plug the display cable into the right bushing:**

- Bushing A: BUS
- Bushing B: ETHERNET



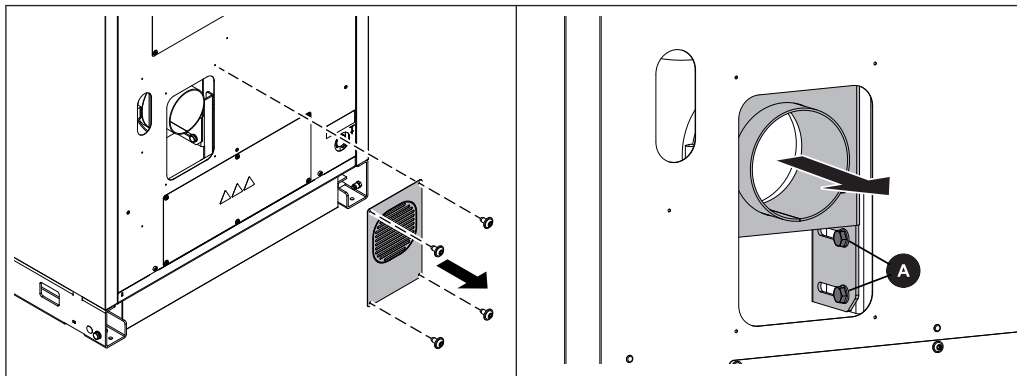
### 5.7.3 Aligning the boiler on the floor

For the PE1 Pellet 7-20, the adjustable feet are adjusted from the outside, for PE1 Pellet 25-35, the adjustable feet are only accessible by removing the front cover plate,  
 ⇒ See "PE1 Pellet 25-35 – Prepare the boiler for transport and setup" [page 41].

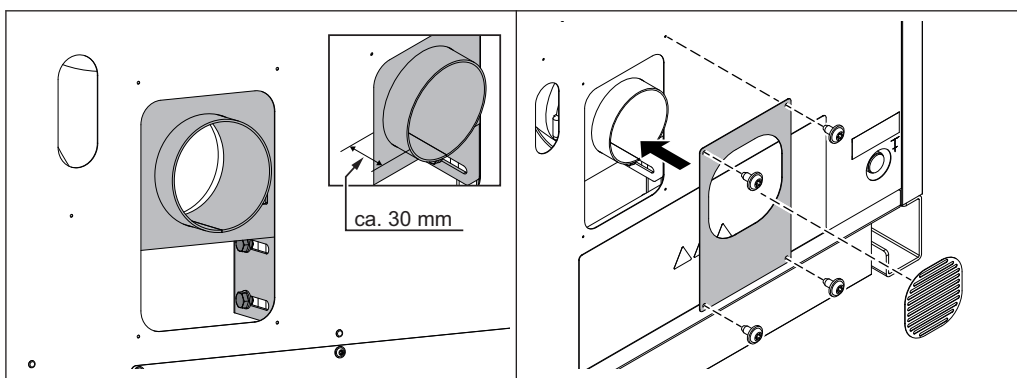


- Lift the boiler up off the floor and use the adjustable feet to level it
  - To avoid structure-borne sound transmission, the bottom of the boiler may not rest on the floor

### 5.7.4 Prepare for room air-independent operation



- ☐ Remove the covering grid plate on the rear of the boiler
- ☐ Loosen both screws (A) on the supply air connection

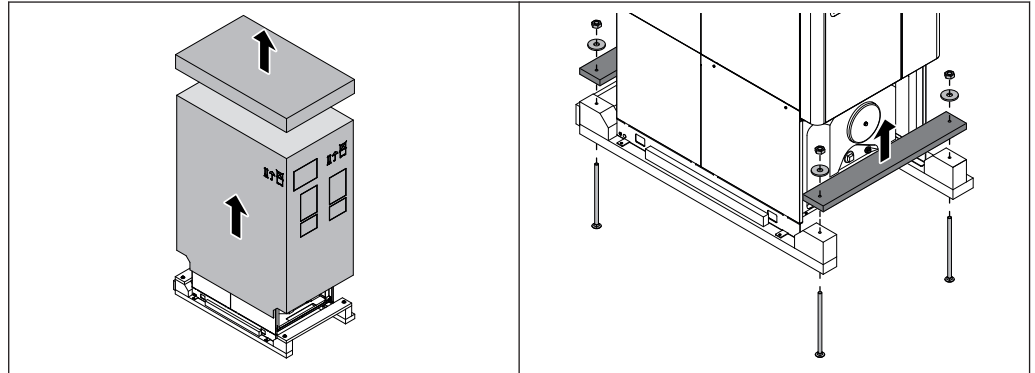


- ☐ Pull back the bracket for the supply air connection until approx. 30 mm of pipe is protruding
- ☐ Secure both screws
- ☐ Remove the grill from the cover plate
- ☐ Remove the burrs with a half-round file
- ☐ Fit the cover plate to the supply air connection

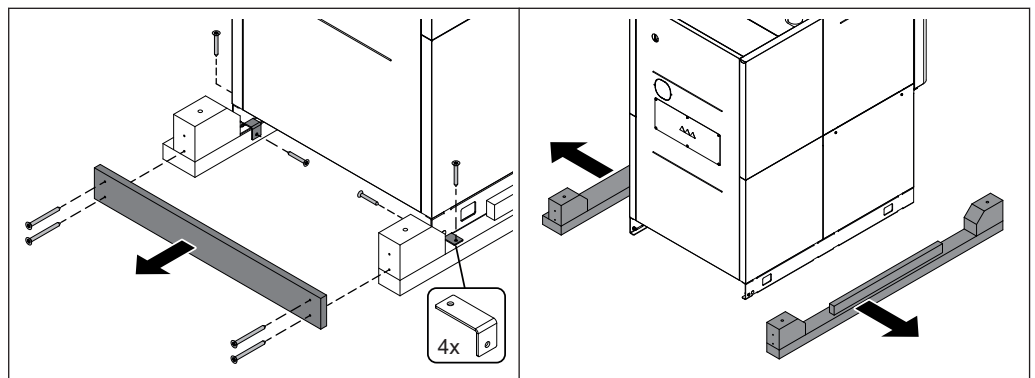


## 5.8 Install the PE1 Pellet Unit

### 5.8.1 Remove boiler from pallet

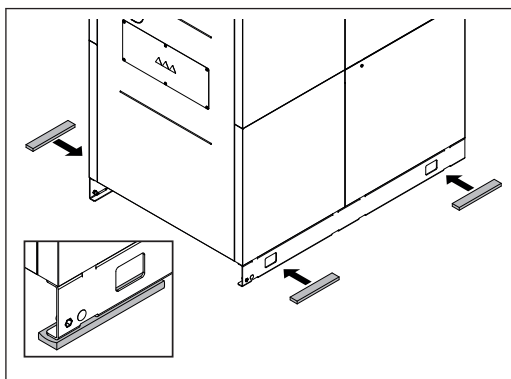


- ☐ Cut through the strapping and lift off the cardboard
- ☐ Loosen the nuts and washers on the top of the pallet and remove the crosspieces



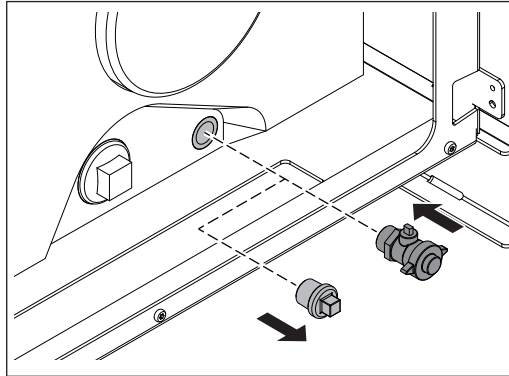
- ☐ Remove the rear crosspiece
- ☐ Loosen the screws and remove the clamping angles
- ☐ Lift the boiler using a forklift or similar lifting device with the appropriate load-bearing capacity and remove the bottom supports of the pallet
- ☐ Transport boiler to the intended position in the installation room
  - Observe the operating and maintenance areas of the equipment in the process!

### 5.8.2 Align the boiler with the floor



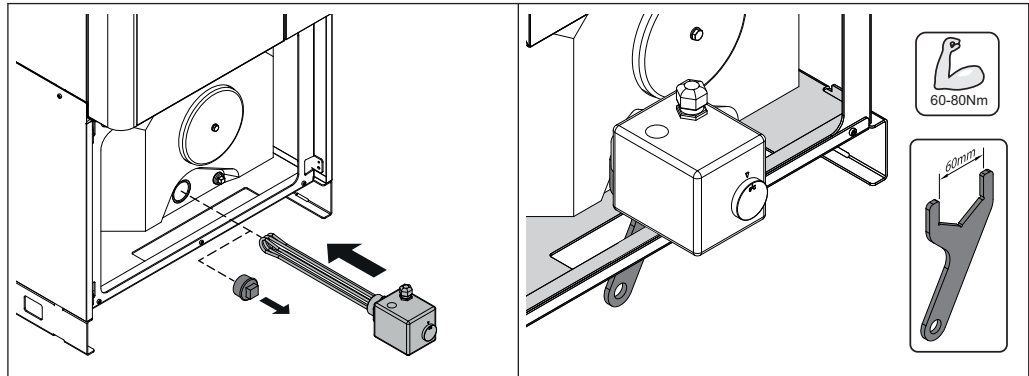
- ☐ Lift the boiler using a forklift or similar lifting device with the appropriate load-bearing capacity and position the boiler underlays

### 5.8.3 Install boiler filling and drainage system



- ☐ Remove the right blanking plug from the DHW tank and seal the boiler filling and drainage system in the sleeve instead

### 5.8.4 Expansion with electronic heating cartridge (optional)

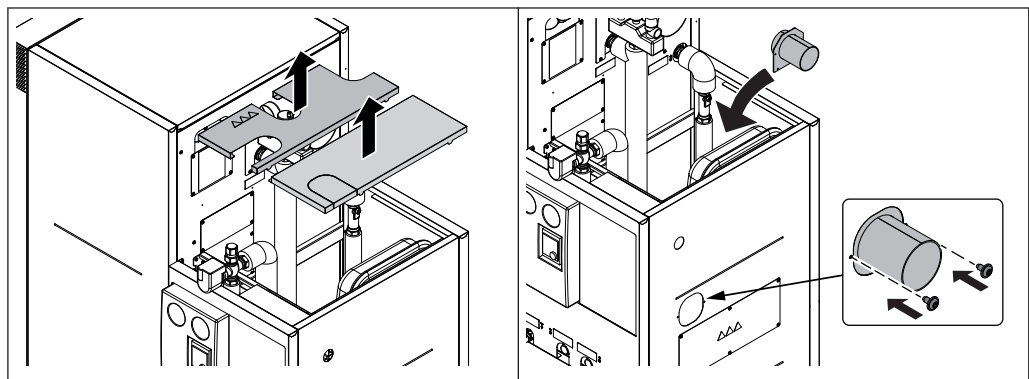
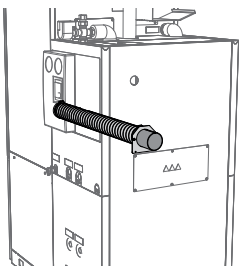


- ☐ Remove the left blanking plug from the DHW tank and seal the electric heating cartridge in the sleeve instead
- ☐ Tighten the electric heating cartridge with the included spanner (60-80 Nm)
- ☐ Run the cable up to the boiler controller

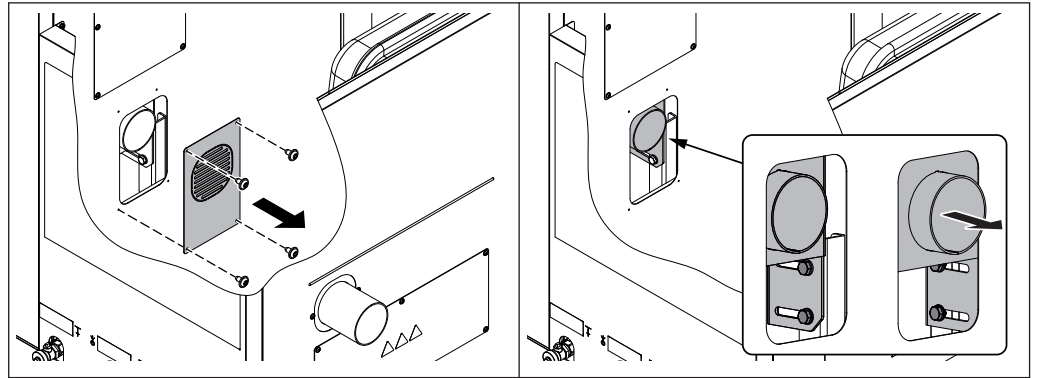
### 5.8.5 Install the connection set for room air-independent operation (optional)

Depending on how the system is set up, the air connection for room air-independent operation can be installed from the back or the top.

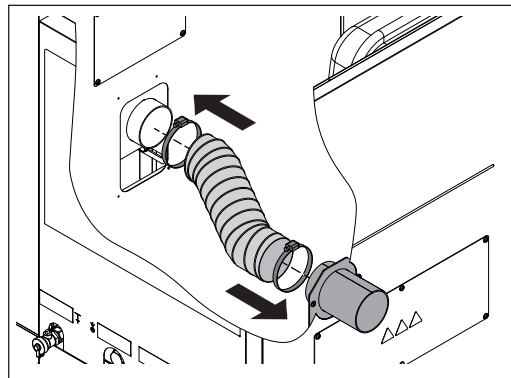
#### Variant 1: Air connection at the rear



- ☐ Lift off both covers
- ☐ Take out the perforation on the back panel and remove the burrs using a half-round file
- ☐ Push the included bracket for the air connection through the hole from the inside
- ☐ Secure the bracket to the back panel
  - The long pipe points to the rear

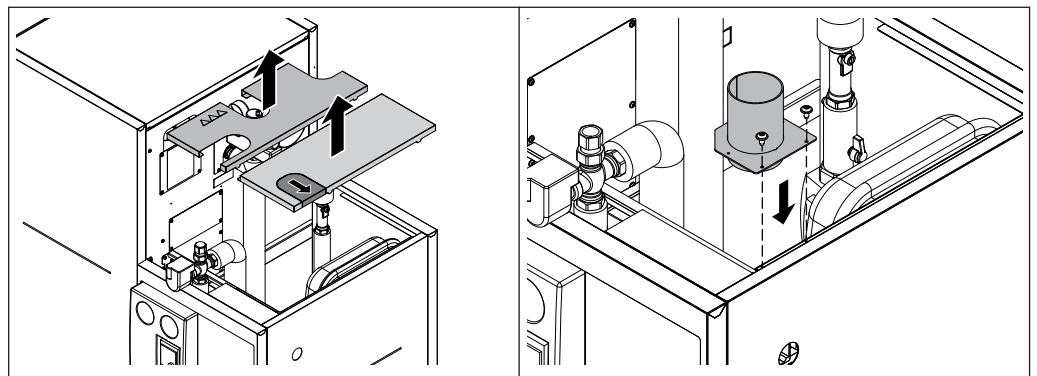
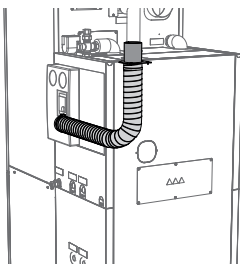


- ☐ Remove the cover plate and grill from the back panel of the boiler
- ☐ Loosen both screws on the air connection
- ☐ Pull the bracket out until it stops and secure using screws

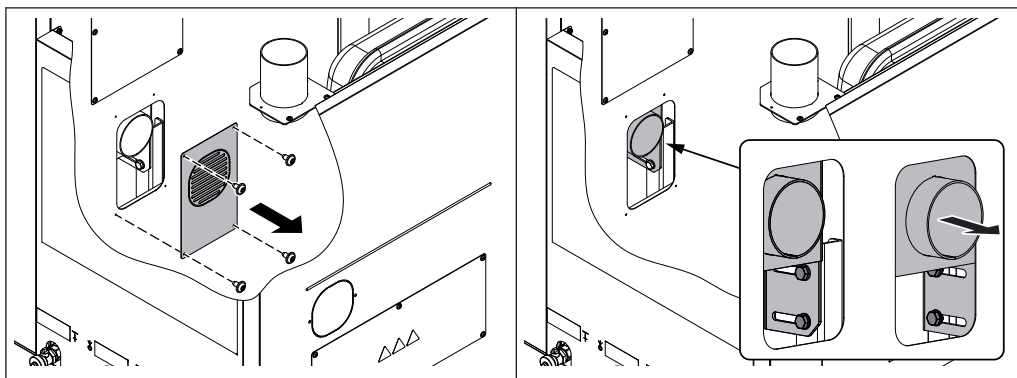


- ☐ Slide the air hose onto both pipes and secure with pipe clamps

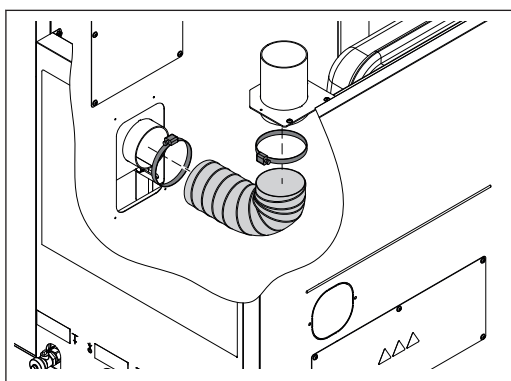
### Variant 2: Top air connection



- ☐ Lift off both rear covers
- ☐ Push out the perforation on the cover and remove the burrs using a half-round file
- ☐ Secure the air connection bracket to the upper side of the frame
  - The long pipe section points up

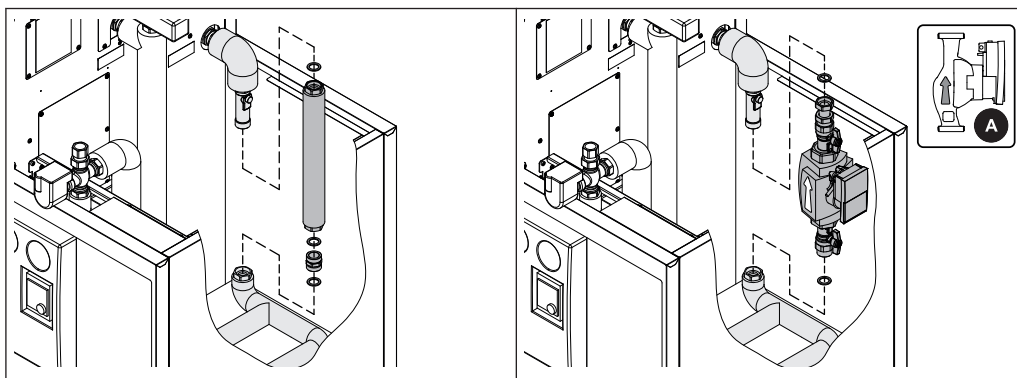


- ☐ Remove the cover plate and grill from the back panel of the boiler
- ☐ Loosen both screws on the air connection
- ☐ Pull the bracket out until it stops and secure using screws



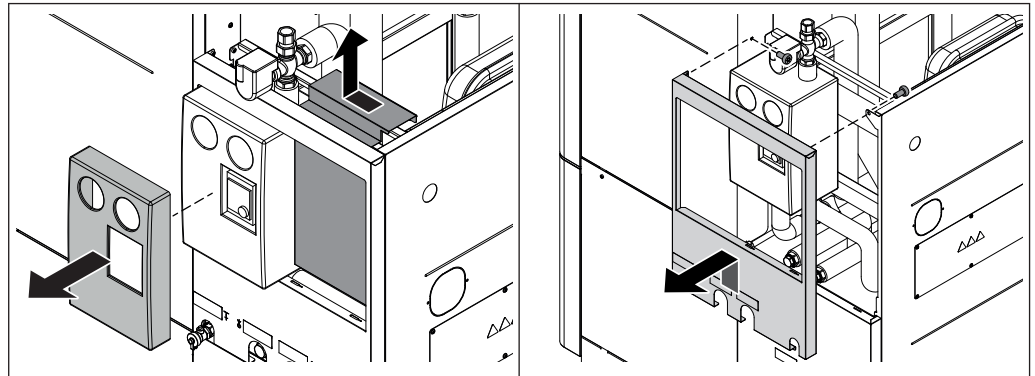
- ☐ Slide the air hose onto both pipes and secure with pipe clamps

### 5.8.6 Expansion with pipe assembly for storage loading (optional)

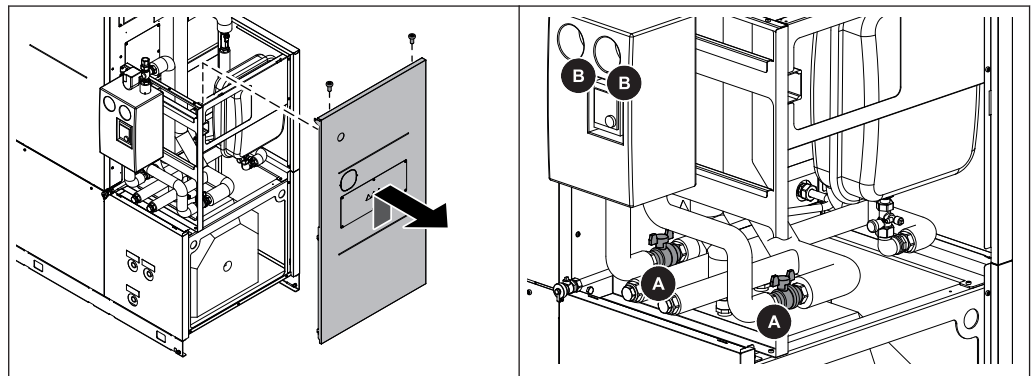


- ☐ Remove the pipe connecting piece from the boiler return
- ☐ Instead, fit the included pipe assembly for storage loading including seals
  - ➔ **CAUTION:** Direction of feed (A) of pump to return connection of boiler

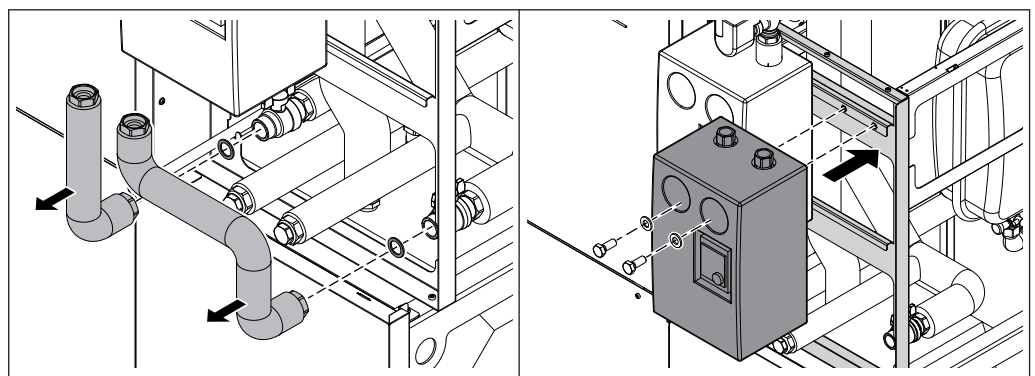
### 5.8.7 Expansion with pump assembly for second heating circuit (optional)



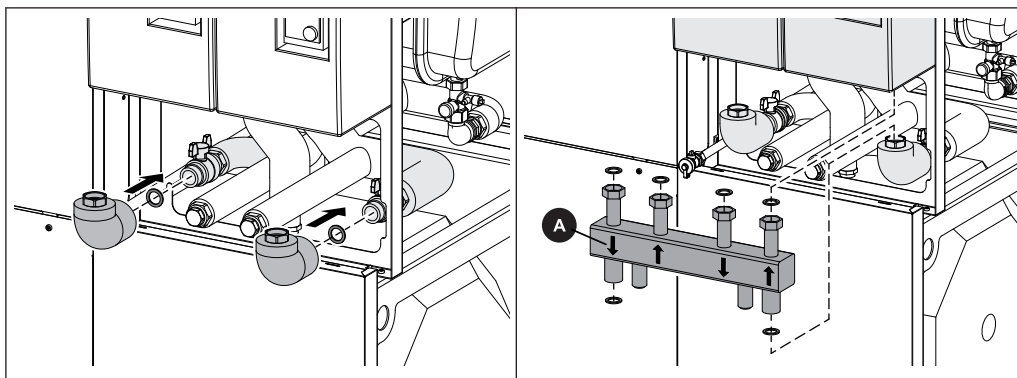
- ☐ Remove thermal insulation from pump assembly
- ☐ Push the cover plate next to the pump assembly slightly forward and unhinge
- ☐ Loosen both screws on the inside of the frame and unhook the right side panel



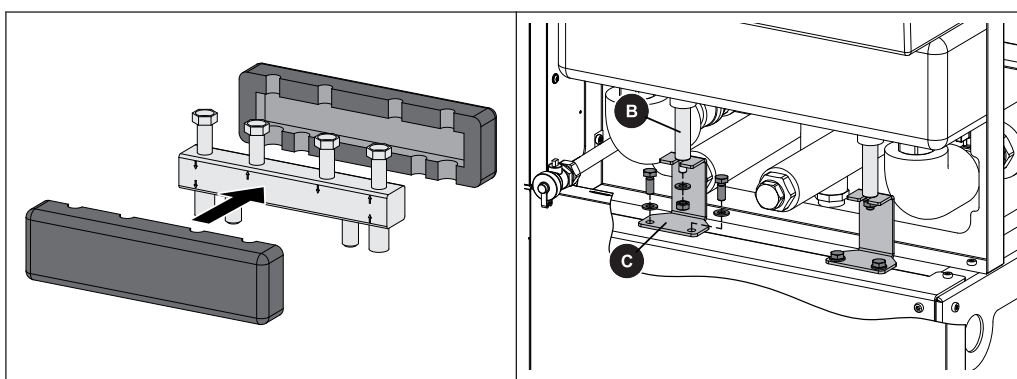
- ☐ Undo both screws on the top and unhook the back panel
- ☐ Shut off the ball valves (A) on the piping to the pump assembly
- ☐ Shut off the flow to the pump assembly by turning the thermometer (B)
  - Direction of rotation - clockwise



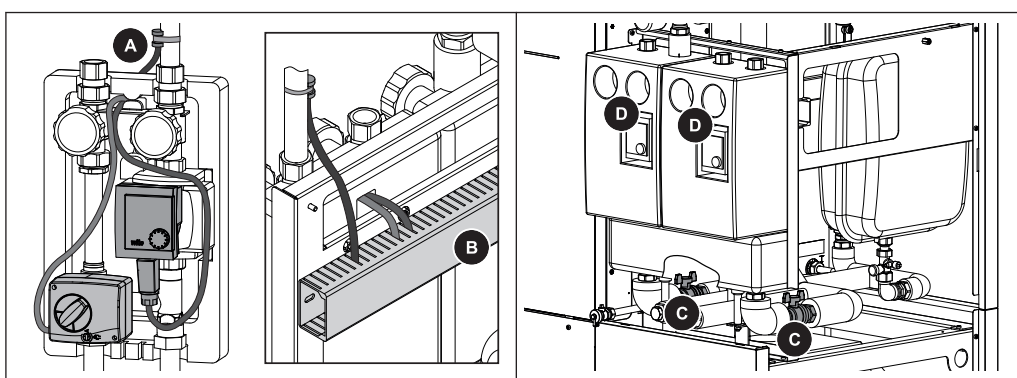
- ☐ Remove the piping between the pump assembly and the ball valves
- ☐ Remove the anterior thermal insulation from the second pump assembly and secure the pump assembly to the frame



- ☐ Fit the elbows, including seals, to the ball valves
- ☐ Fit the distributor, including seals, to the bottom of the pump assembly and to the elbows
  - ➔ CAUTION: Pay attention to the directions of flow (A)!

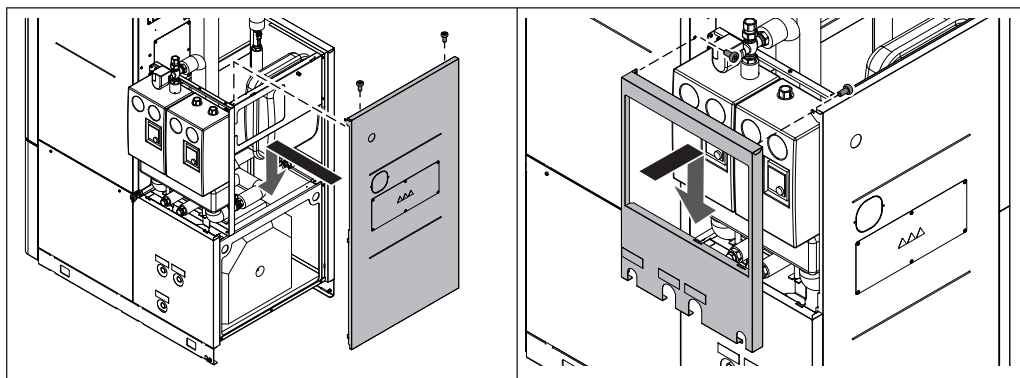


- ☐ Attach the thermal insulation to the distributor
- ☐ Slide the support (B), thread facing down, into the distributor bar
- ☐ Attach the retaining plates to the frame and to the supports



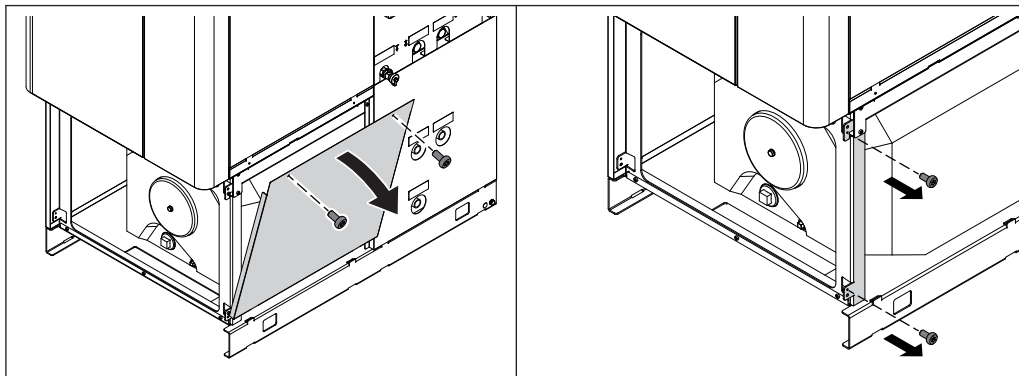
- ☐ Fit the contact sensor (A) to the appropriate position on the flow
- ☐ Run the cable for the contact sensor, the heating circuit pump and the mixer to the cable duct (B) behind the pump assembly
- ☐ Open the ball valves (C) on the piping to the pump assembly
- ☐ Release the flow to the pump assembly by turning the thermometer (D)
  - ➔ Direction of rotation - anti-clockwise



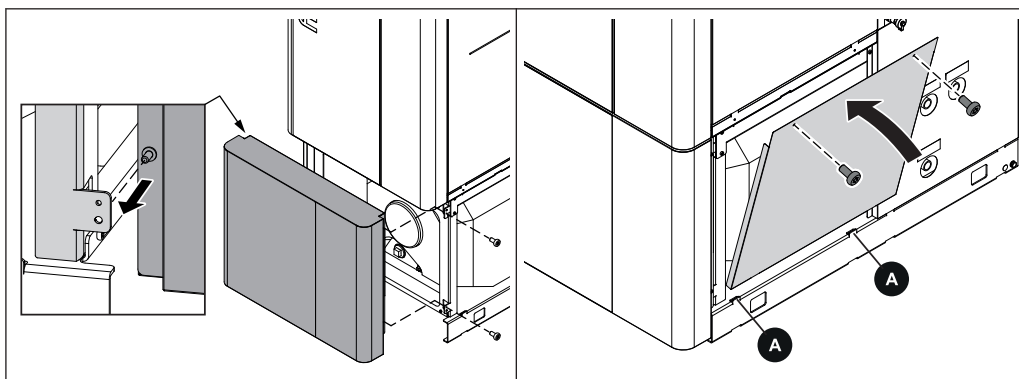


- ☐ Fit the rear panel to the frame and use two screws to secure it on the top
- ☐ Fit the side panel and use two screws to secure it to the frame

### 5.8.8 Fit the front cover

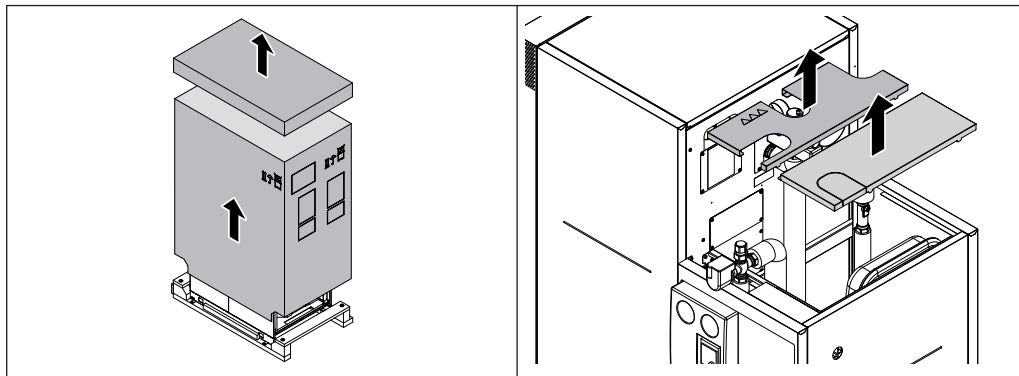


- ☐ Undo the screws on the right side panel and remove the side panel
- ☐ Remove the screws from the frame behind

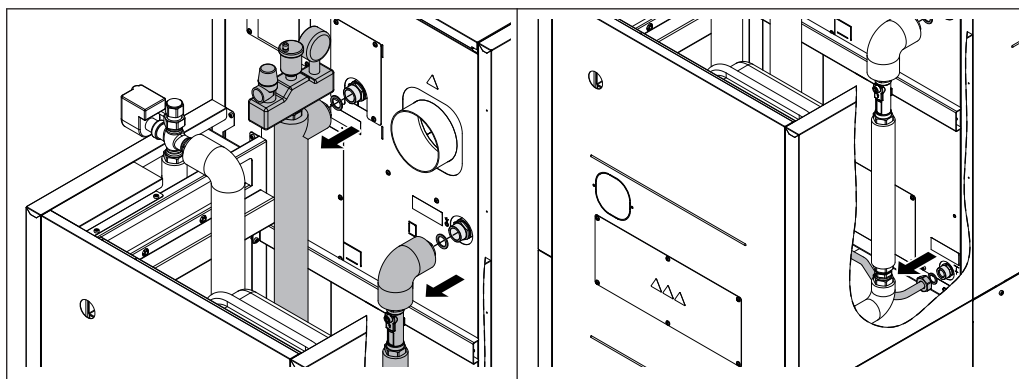


- ☐ Insert the bolts on the included cover on the left frame and use the previously removed screws to attach to the right frame
- ☐ Insert the right side panel into the lugs (A) on the bottom of the boiler and secure it with screws at the top

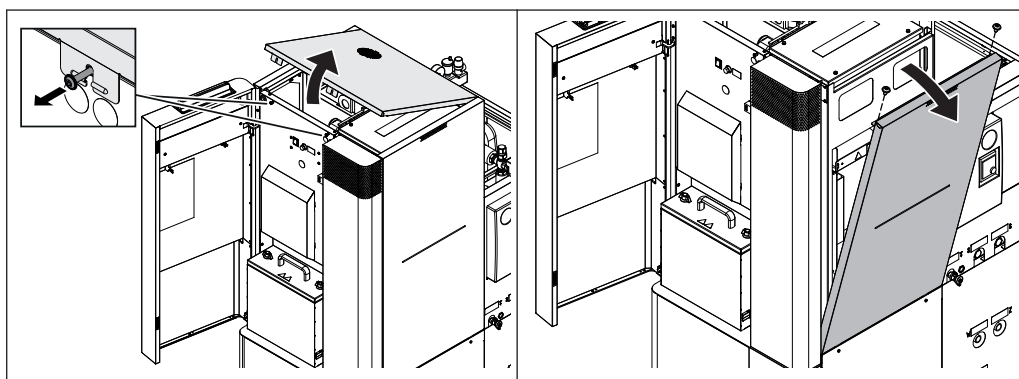
### 5.8.9 Disassembling to make transporting the PE1 Pellet Unit easier



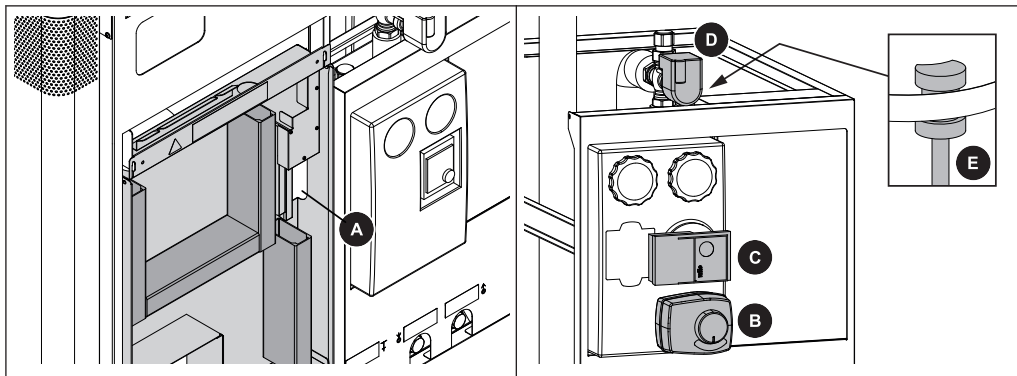
- ☐ Lift box off pallet
- ☐ Lift off both rear covers



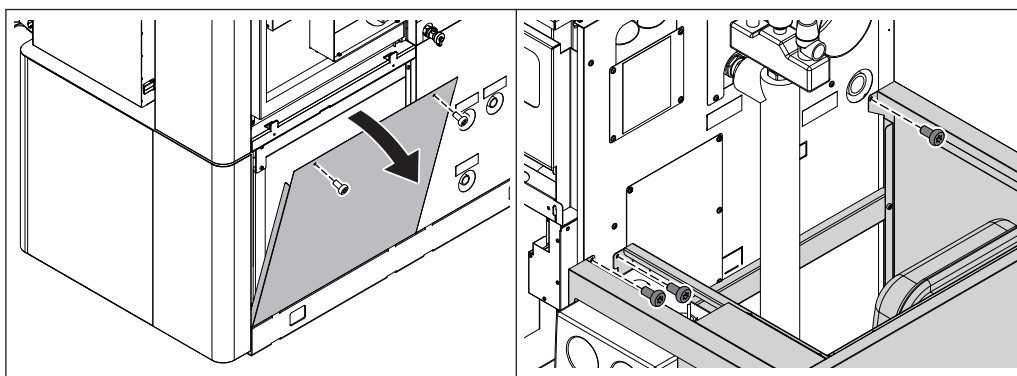
- ☐ Undo the piping for the boiler's flow and return
- ☐ Undo the piping for boiler drainage



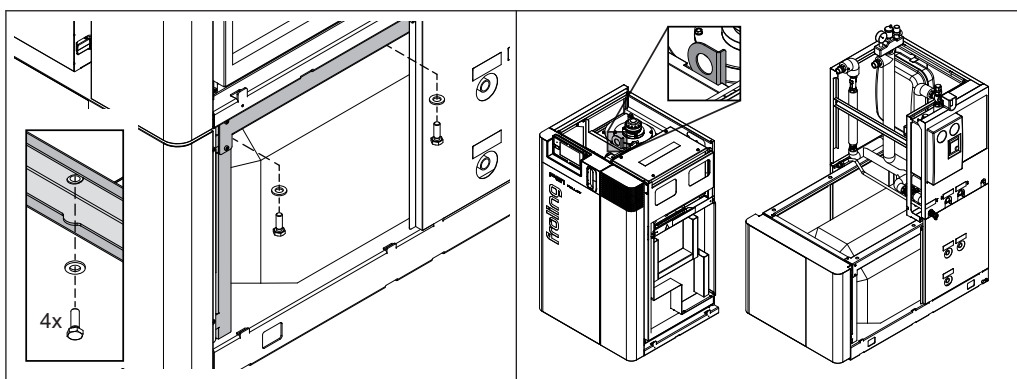
- ☐ Open the insulated door and slightly loosen the retaining screws behind it
- ☐ Lift the top cover slightly at the front and unhook
- ☐ Undo both screws at the top of the right side panel and unhook the side panel



- ☐ Unplug the connectors for the following components in the controller box and pull the cable from opening (A) on the controller box:
  - B – mixing valve for the first heating circuit on the core module
  - C – heating circuit pump for the first heating circuit on the core module
  - D – isolating valve for the flow on the hydraulic module
  - E – flow temperature sensor for the first heating circuit on the core module



- ☐ Remove left and right side panels
- ☐ Undo three screws on the frame of the rear panel of the boiler



- ☐ Undo the four screws on the frame above the DHW tank and lift the boiler down
  - To do so, use a crane hook
  - CAUTION: Using forklift forks may damage the boiler
- ☐ Transport the components to the installation site and reassemble them in the reverse order

## 5.9 Installing the discharge system

Once the discharge system has been assembled in accordance with the assembly instructions enclosed, the suction and return air line needs to be connected to the boiler and the external suction module connected as well.

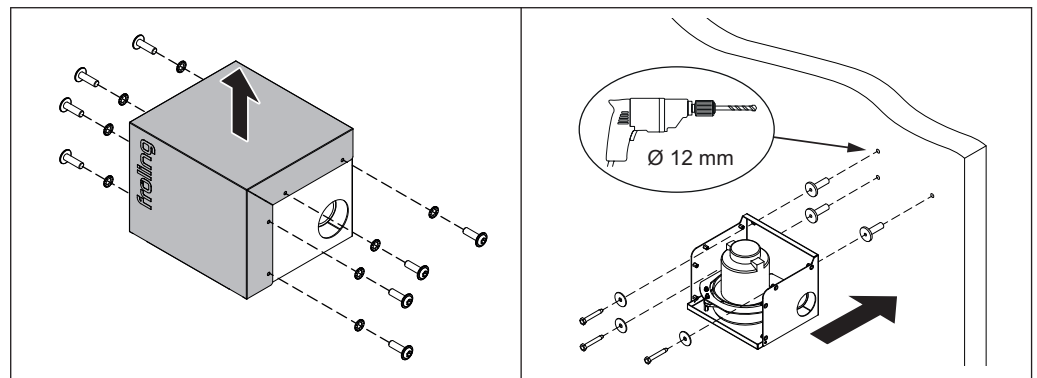
### 5.9.1 Installing the external suction module

The pellets are loaded using an external suction module. The suction module is installed in the return-air line between the boiler and the suction point.

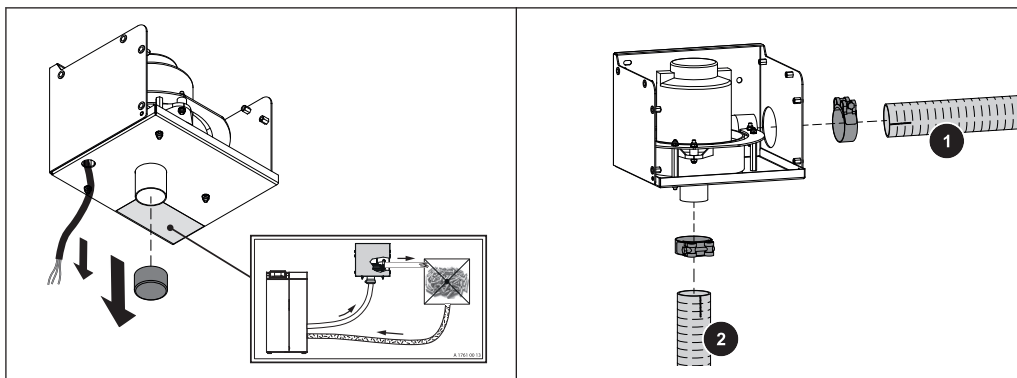
The following points should be noted for assembly:

- The position in the return air line can be chosen freely.  
When using an optional PST pellet dust extractor, it is recommended that the suction module be installed in the return air line between the pellet dust extractor and the store to protect the turbine from pellet dust
- Before assembly, check whether the supplied assembly material is suitable and, if required, needs to be replaced by suitable material for the base.
- No specific installation position is required for the suction turbine to operate smoothly. Preferably, the suction module should be mounted so that existing openings in the housing are not on the upper side and the suction turbine is protected against external influences.
- To prevent interference with moving parts, the electrical connection and the setup of the external suction module should be carried out only after connecting the hose lines.

Depending on the boiler type, two different sized suction modules are used. The installation itself is the same for both sizes.

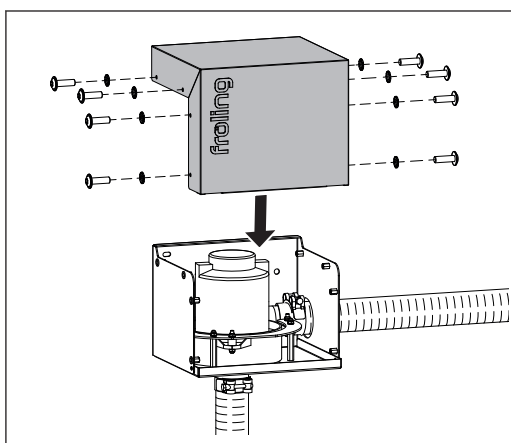


- ☐ Unscrew the screws on the side of the suction module and remove the cover hood
- ☐ Install the bottom panel including the supplied dowels and screws at any desired position in the return air line
  - ➔ If the suction module is positioned at a maximum distance of 2 m to the boiler, the power supply line can be plugged in as is. When distances are greater the power supply line must be lengthened accordingly on-site



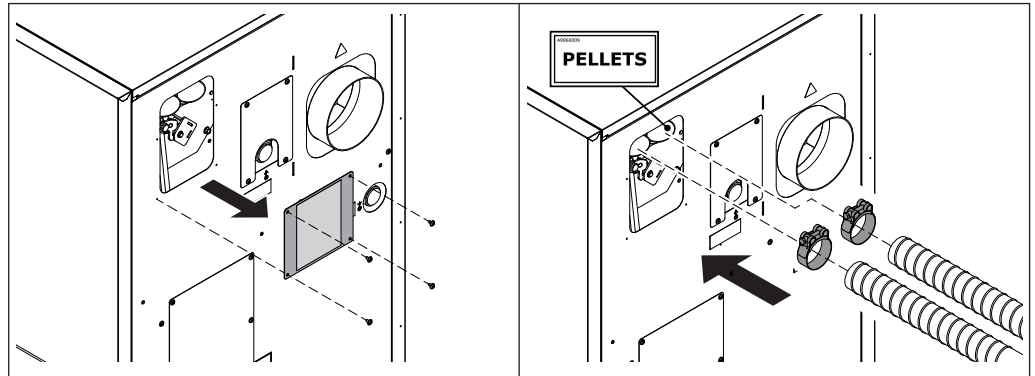
- ☐ Unwind the cable of the suction turbine and feed it through the opening of the housing underside
- ☐ Remove the protective cap on the underside of the suction module
- ☐ Lay the return air line from the suction point to the suction module and fix it to the pressure side (position 1) with a hose clamp
- ☐ Fix the second part of the return-air line to the under-pressure side (position 2) with a hose clamp and lay the line to the boiler

**NOTICE!** When connecting the lines, pay attention to equipotential bonding, ⇒ [See "Assembly information for hose lines" \[page 60\]](#)



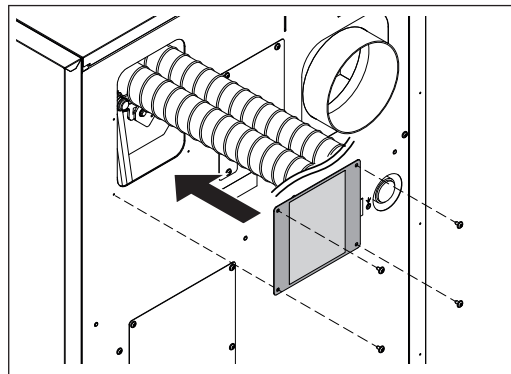
- ☐ Secure the cover hood with the previously removed screws

### 5.9.2 Connect the suction hoses to the boiler



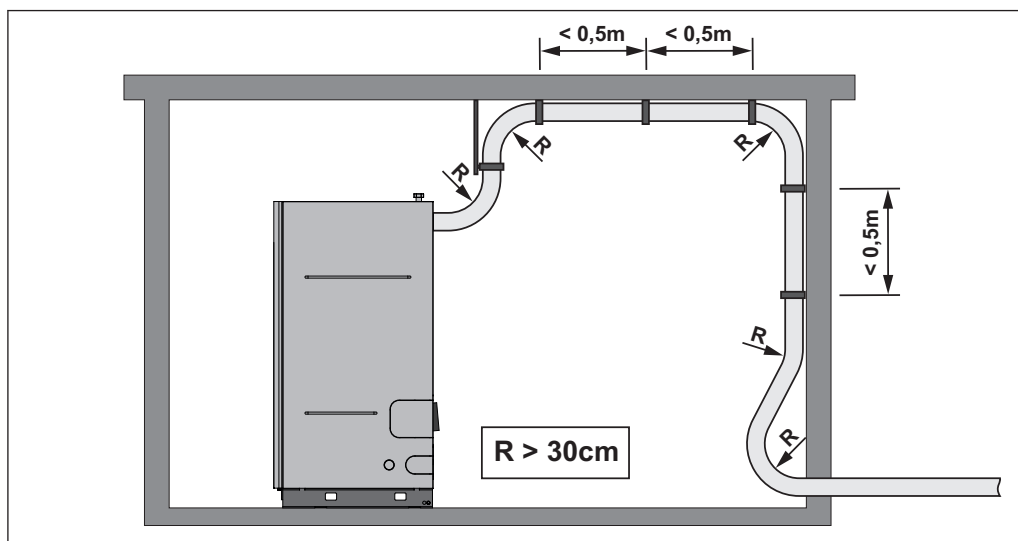
- ☐ Dismantle the cover plate on the connections
- ☐ Use hose clamps to secure suction hoses to the connections
  - Left-hand connection: Return-air line
  - Right-hand connection: Suction hose (sticker PELLETS)

**NOTICE!** When connecting the lines, pay attention to equipotential bonding, ⇒ See "Assembly information for hose lines" [page 60]



- ☐ Install the cover plate under the suction hoses

### 5.9.3 Assembly information for hose lines



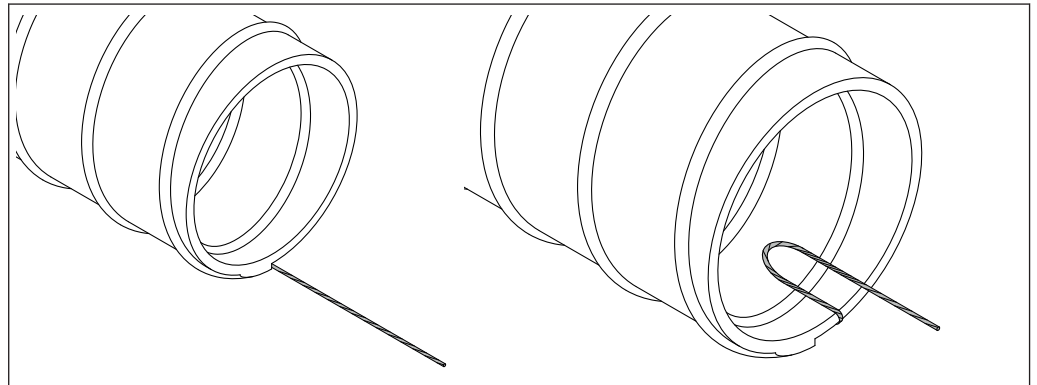
Please note the following with regard to the hose lines used in Froling vacuum discharge systems:

- Do not kink the hose lines! Minimum bending radius = 30cm
- Lay the hose lines as straight as possible! Sagging lines can lead to so-called “pockets”, which may cause problems with the pellet feed.
- Lay the hose lines in short sections away from walking areas.
- Hose lines are not UV-proof. Therefore: Do not lay 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 on both sides to ensure that no static charge builds up as a result of transporting the pellets.
- The suction hose to the boiler must be in a single section.
- The return-air line can be made up of several sections, but consistent potential equalisation must be established throughout the line.
- For systems starting at 48 kW, only suction hoses with PU inlets are recommended due to the increased load.

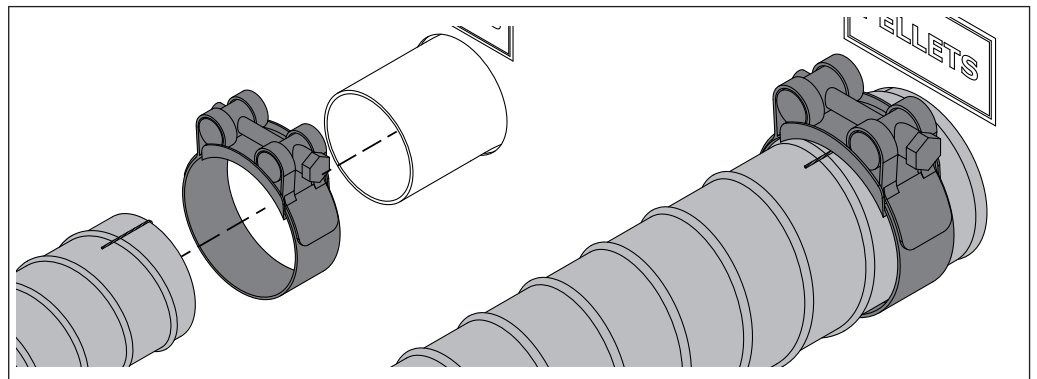


### Potential equalisation

When connecting the hose lines to the individual connections, ensure there is consistent potential equalisation throughout the line.

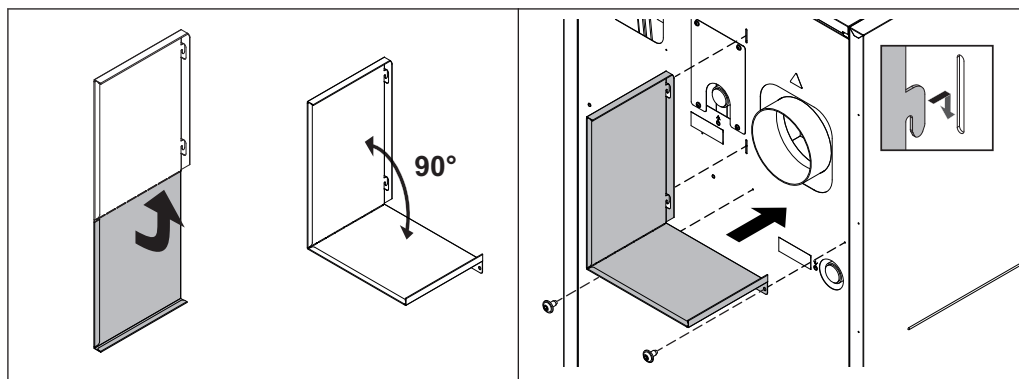


- ☐ Expose approximately 3 cm of the earth wire at the end of the hose line
  - **TIP:** Slit the insulation open along the wire with a knife
- ☐ Bend the earth wire inwards in a loop
  - This prevents the earth wire from being damaged by the pellet movement



- ☐ Slide the hose clamp onto the hose line
- ☐ Attach the hose line to the connector
  - Ensure that contact is established between the earth wire and the connector
  - **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 grease).
- ☐ Secure the hose line with a hose clamp

### 5.10 Install the protective plate for the flue pipe



- ☐ Bend the cover plate on the punched edge to 90°
- ☐ Replace the protective plate on the rear of the boiler and attach it with screws
  - The protective plate shields the boiler components from the hot flue gas pipe to the chimney.

## 5.11 Electrical Connection



### DANGER



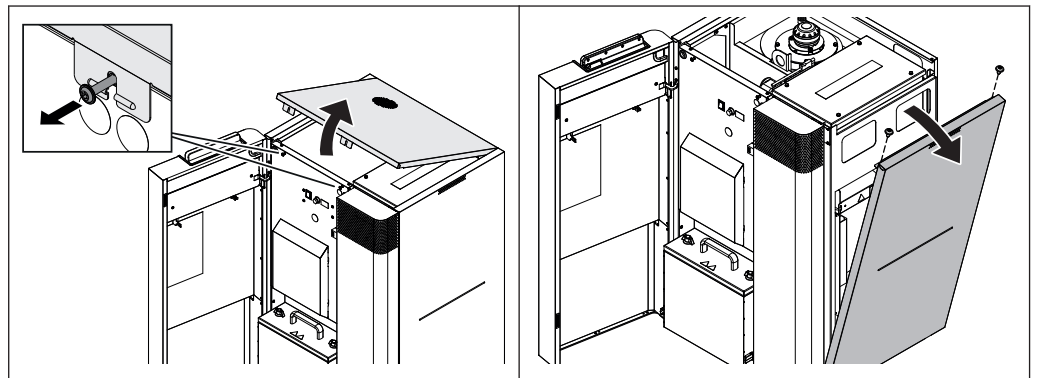
When working on electrical components:

***Risk of electrocution!***

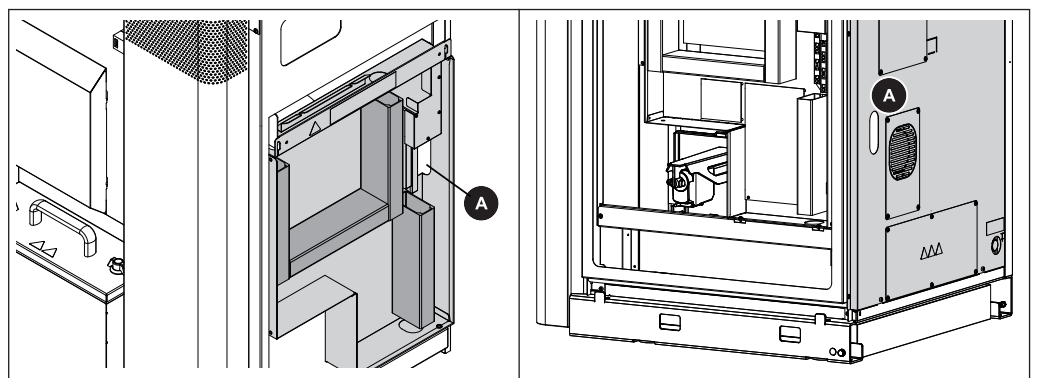
When work is carried out on electrical components:

- ☐ 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

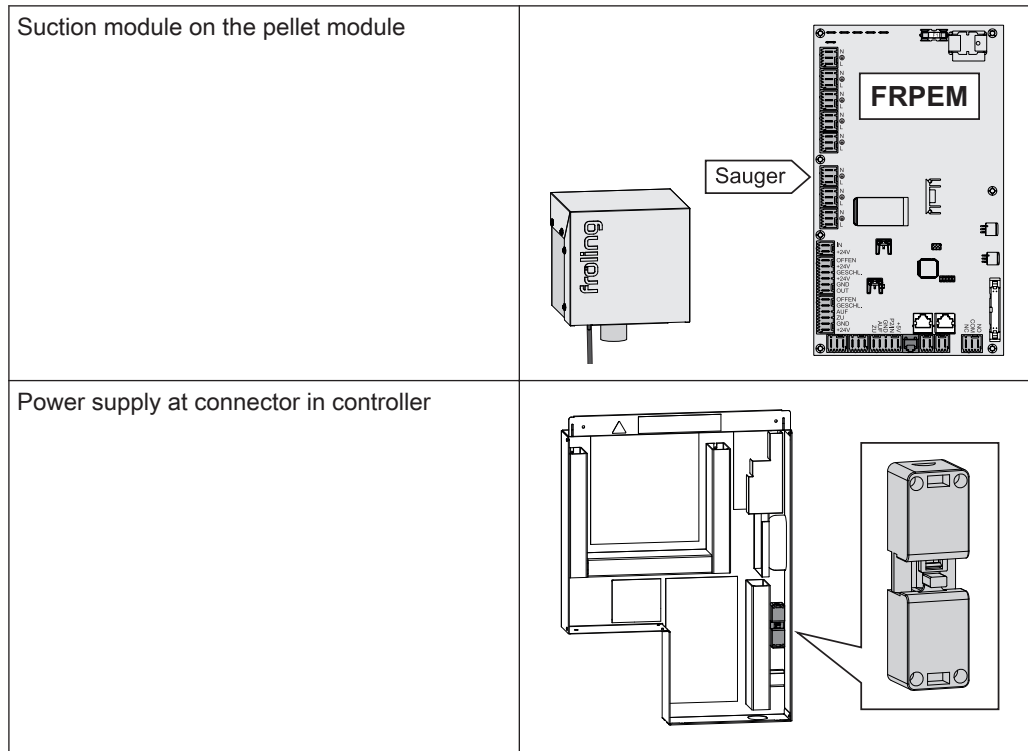
- ☐ Flexible sheathed cable must be used for the wiring; this must be of the correct size to comply with applicable regional standards and regulations.



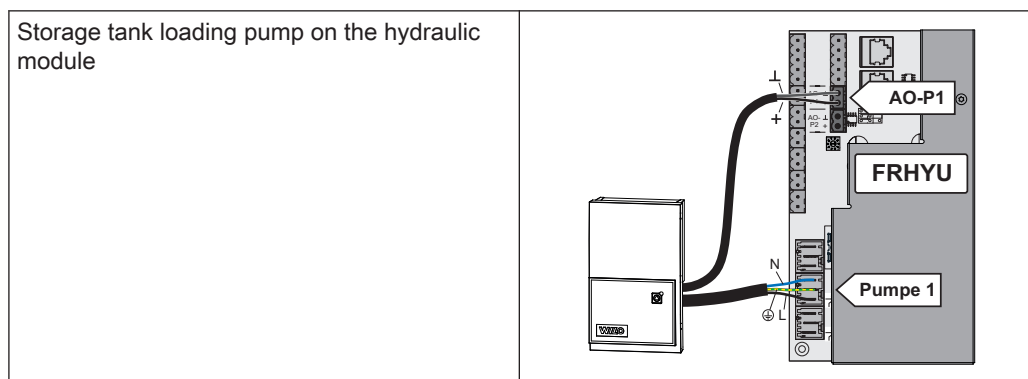
- ☐ Unlock the cover by undoing the retaining screws
- ☐ Lift the cover on the front edge slightly and remove it towards the front
- ☐ Undo the screws on the top and remove the side panel



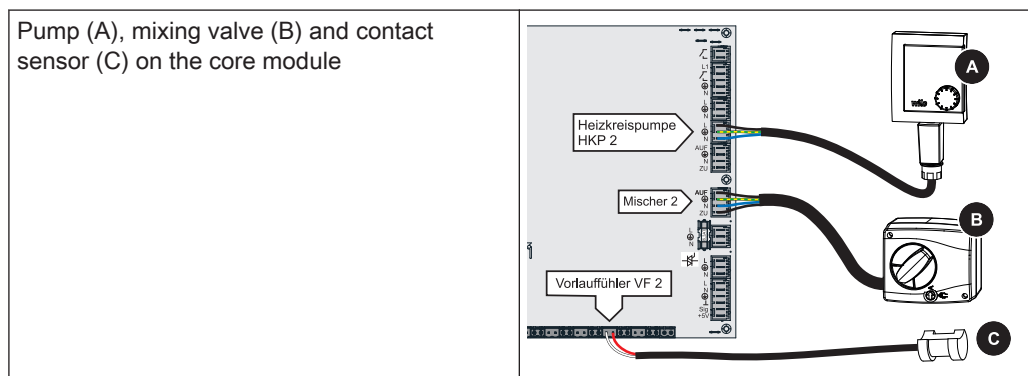
- ☐ Run the cables of all components through cut-out (A) in the back panel to the controller and plug in to the following boards



### *For pipe assembly for storage tank loading*



### *For pump assembly for second heating circuit*



NOTICE! Observe additional information in the relevant boiler controller documentation!

### 5.11.1 Information on circulating pumps

#### NOTICE

*According to 2012/622/EU external, wet running circulating pumps must comply with the following limit values of the Energy Efficiency Index (EEI):*

- *Effective from 01/01/2013: Wet running circulating pumps with  $EEI \leq 0.27$*
- *Effective from 08/01/2015: Wet running circulating pumps with  $EEI \leq 0.23$*

Only high efficiency pumps with a connection option for a control signal (PDM / 0-10V) should be connected to speed-controlled pump outputs (pump 1 on the core module and pump outputs on the hydraulic module). In this case, the control line is connected to the corresponding PDM outputs of the boards. Observe the connection instructions in the boiler controller documentation!

#### CAUTION



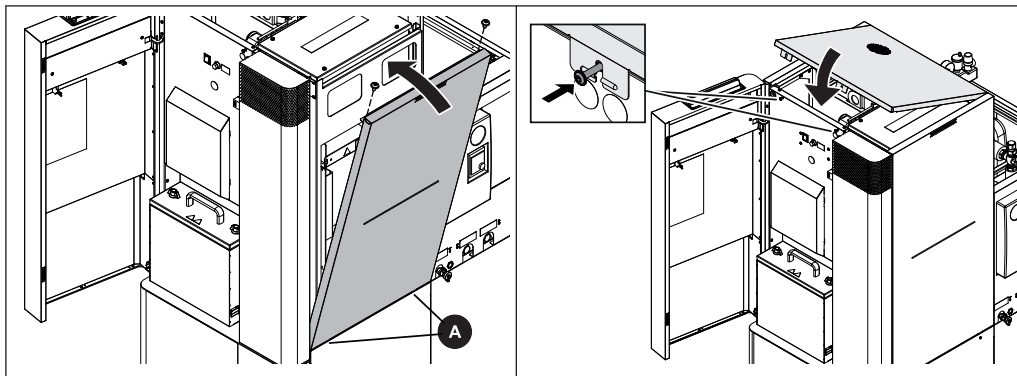
When using high efficiency pumps without an additional control line at speed-controlled pump outputs:

*Malfunctions of the boiler, the pump and the hydraulic system may occur!*

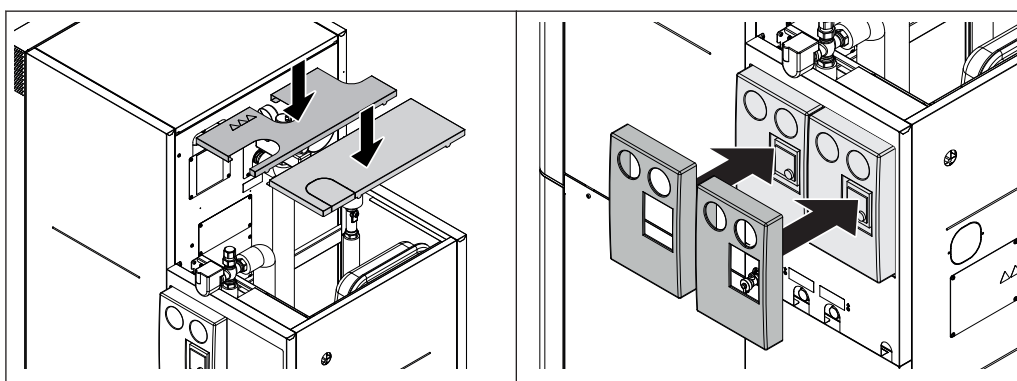
Therefore:

- ☐ Do not connect EC motor pumps without a control line to the speed-controlled pump outputs of the boards.
  - ➔ Only use special high efficiency pumps with a connection option for a control line (PDM/0-10V)!
  - ➔ Observe the additional instructions and information on board outputs in the operation instructions for the boiler controller.

## 5.12 Final installation steps



- ☐ Insert side panel into lugs (A) and attach at the top
- ☐ Insert the cover at the rear and attach it with a retaining screw



- ☐ Place both covers on the back
- ☐ Place thermal insulation on the pump assembly

## 6 Start-up

### 6.1 Filling the system with drinking water

When using optional boiler blocks (PE1 Pellet Unit), the system must be filled with drinking water before the first start.

#### NOTICE

**Damage to the electric heating element as a result of incorrect start-up**

*The electric heating element can be destroyed if installed (electrically isolated) in a system which is not completely filled before start-up*

Therefore:

- ☐ Only start up the system once it is completely filled
- ☐ Ensure that all necessary discharge taps are fitted and turned off
- ☐ Open at least one of the valves in the drinking water supply system to ensure that it is vented while it is being filled
- ☐ Fill the domestic water tank with cold drinking water
- ☐ Check that all connections on the drinking water side are tight
- ☐ Check the safety valve on the cold water supply line is in good working order
  - ➔ the safety valve must trip at max. 6 bar

#### NOTICE

**Damage to the system caused by excess pressure**

*The system will suffer damage if the pressure in the cold water supply line exceeds 6 bar*

Therefore:

- ☐ Install a safety valve in the supply line to the domestic water tank
  - ➔ We also recommend installing an additional pressure relief valve
- ☐ Bleed all the drinking water supply valves connected to the heating system in order until water starts to come out
  - ➔ This ensures there is no air in the drinking water pipe system

## 6.2 Before commissioning / configuring the boiler

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

### NOTICE

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

### NOTICE

*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.

- ☐ Turn on the main switch.
- ☐ Set the boiler controller to the system type.
- ☐ Load the boiler default values.

**NOTICE! For the keypad layout and necessary instructions for modifying the parameters, see the instruction manual for the boiler controller.**

- ☐ 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 water connections are tightly sealed.
  - Pay particular attention to those connections from which plugs were removed during assembly.
- ☐ Check to see whether all of the necessary safety devices are in place.
- ☐ Check that there is sufficient ventilation in the boiler room.
- ☐ Check the seal 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.

**NOTICE! Check the digital and analogue inputs and outputs - See the instruction manual for the boiler controller.**



## 6.3 Initial startup

### 6.3.1 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 <i>plus</i> / DIN <i>plus</i> certification scheme

#### **General note:**

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

### 6.3.2 Non-permitted fuels

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

#### **CAUTION**

**In case of use of non-permitted fuels:**

*Burning non-permitted fuels increases the cleaning requirements and leads to a build-up of aggressive sedimentation and condensation, which can damage the boiler and also invalidates the guarantee. Using non-standard fuels can also lead to serious problems with combustion.*

For this reason, when operating the boiler:

- ☐ Only use permitted fuels

### 6.3.3 Heating up for the first time

#### **NOTICE**

**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.

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

## 7 Decommissioning

### 7.1 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

### 7.2 Disassembly

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

### 7.3 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.

## 8 Notes

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## 9 Appendix

### 9.1 Addresses

#### 9.1.1 Address of manufacturer

**FRÖLING**  
Heizkessel- und Behälterbau GesmbH

Industriestraße 12  
A-4710 Grieskirchen  
AUSTRIA

TEL 0043 (0)7248 606 0  
FAX 0043 (0)7248 606 600  
EMAIL [info@froeling.com](mailto:info@froeling.com)  
INTERNET [www.froeling.com](http://www.froeling.com)

#### *Customer service*

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

#### 9.1.2 Address of the installer

<div>Stamp</div>
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