

froling

Installation instructions Pellet boiler P4 Pellet



Translation of original German version of installation instructions for technicians.

Read and follow all instructions and safety instructions.
All errors and omissions excepted.



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1 General

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

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

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

Subject to technical change.

*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 P4 Pellet boilers:

P4 Pellet 45¹⁾, P4 Pellet 48, P4 Pellet 60, P4 Pellet 70²⁾, P4 Pellet 80, P4 Pellet 100 (99kW)³⁾, P4 Pellet 100, P4 Pellet 105⁴⁾

1) P4 Pellet 45 is available only in Great Britain; 2) P4 Pellet 70 is available only in France;

3) P4 Pellet 100 with 99kW rated heat output is available only in Great Britain; 4) P4 Pellet 105 is available only in Germany

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
- Providing 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)

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 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

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

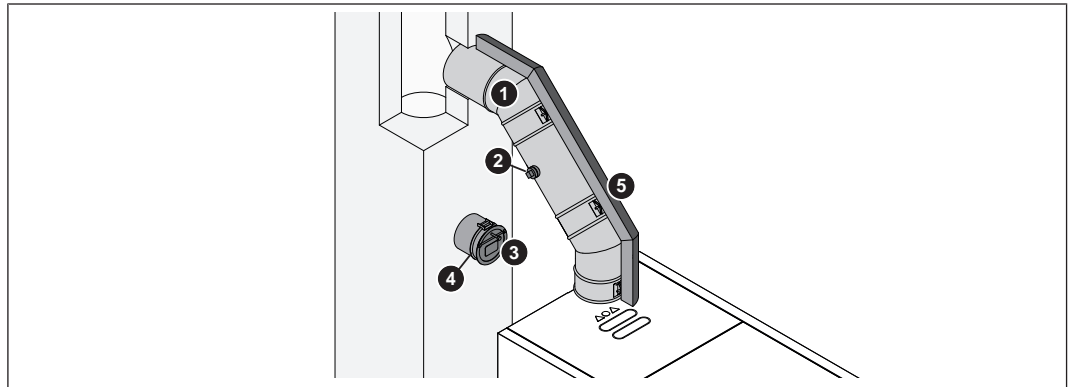
Requirements for the load bearing substrate:

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

Conditions at the installation site:

- Frost-free
- Sufficiently well lit
- Free of explosive atmospheres such as flammable substances, hydrogen halides, cleaning agents and consumables
- Installation at altitude higher than 2000 metres above sea level only after consultation with the manufacturer
- The system must be protected against gnawing and nesting by animals (such as rodents)
- No flammable materials in proximity to the system

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 |

NOTICE! 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:

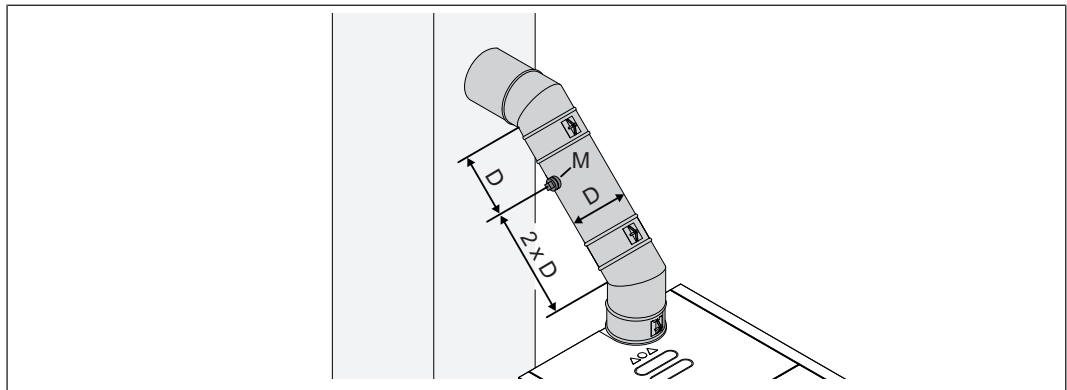
- This should be as short as possible and follow an upward incline to the chimney (30 - 45° (recommended))
- Leak-tight against overpressure
- Thermal insulation recommended

Distance from flammable components:

- 100 mm if at least 20 mm thermal insulation is installed
 - 375 mm if no thermal insulation is present
- Recommendation: three times the diameter of the connection line

3.4.2 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.

3.4.3 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.

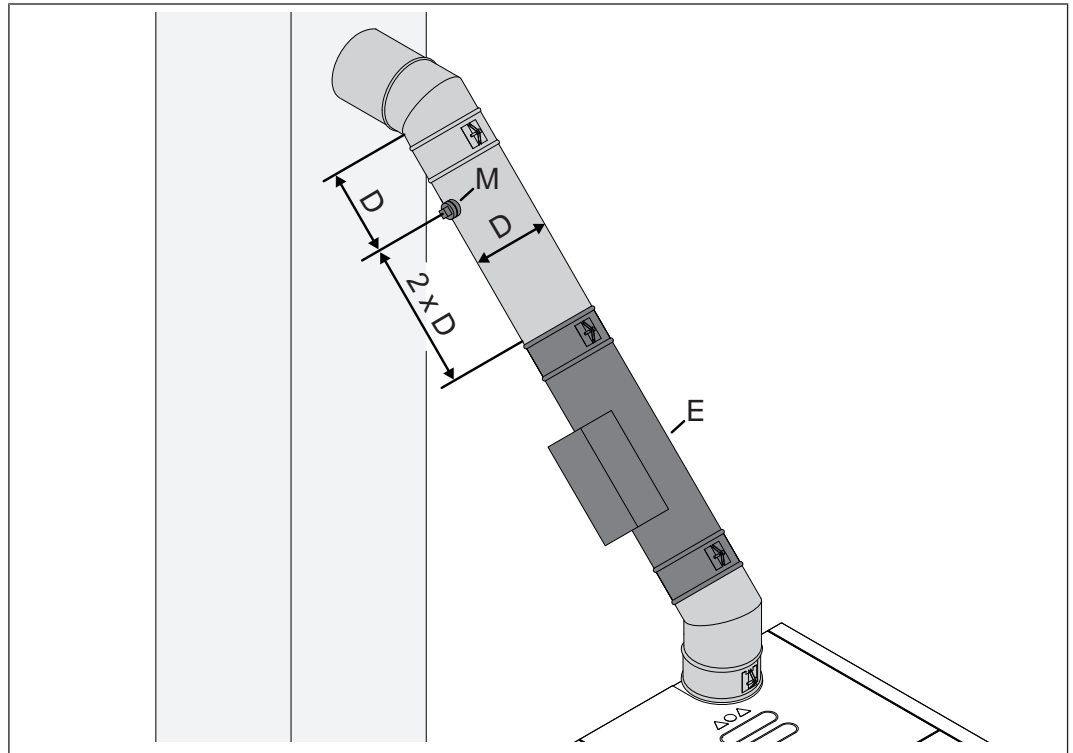
NOTICE! Install the draught limiter directly under the mouth of the flue line, as the pressure is constantly low at this point.

3.4.4 Explosion flap

TRVB H 118 (only Austria) stipulates that an explosion flap must be installed in the connection line to the chimney, directly next to the boiler. It should be situated in such a way that it poses no risk to persons!

3.4.5 Electrostatic particle separator

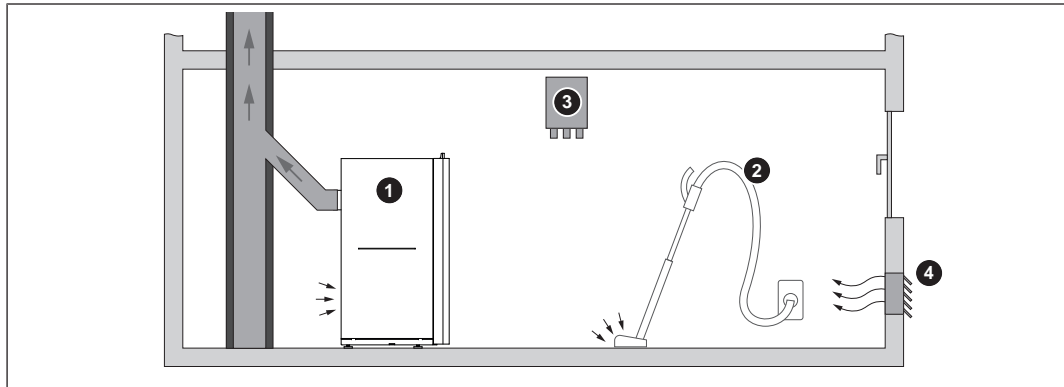
For reduction in the emissions an electrostatic particle separator may optionally be installed in the flue gas line.



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" \[► 10\]](#)
- 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 for room air-dependent operation



- | | |
|---|--|
| 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 |

3.5.1 Combustion air supply at the installation room

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

Requirements:

- Opening to the atmosphere
 - Weather conditions must not affect the air flow in any way (e.g. snow and foliage)
 - Cross-section area free of obstructions such as cover gratings and slats
- Air supply lines
 - For air supply lines longer than 2 metres and where mechanical means are used to feed combustion air, the flow rate must be calculated (maximum flow rate = 1 m/s)

Note on standards

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

3.5.2 Simultaneous operation with other air-drawing systems

Where the boiler is operated in room air-dependent mode with simultaneous operation of other air-drawing systems (such as room ventilation), safety devices are necessary:

- Air pressure monitor
- Flue gas thermostat
- Window-tilting drive system, window-tilting switch

NOTICE! Clarify the safety devices with appropriate flue sweep / chimney sweep

Recommendation for room ventilation:

Use “intrinsically-safe” room ventilation systems with F classification

As a basic rule:

- Room under-pressure max. 8 Pa
- Air-drawing systems must not exceed the room under-pressure value
 - If the room under-pressure value is exceeded, safety equipment (under-pressure monitoring system) is necessary

In Germany, the following additional requirement must be observed:

DiBt requires that an approved under-pressure monitoring system (such as air pressure monitor P4) which monitor the maximum under-pressure to 4 Pa must be installed in the installation room.

In addition, at least one of the following three requirements must be met:

(Source: Section 4 MFeuV 2007 / 2010)

- Dimension the cross-section of the combustion air opening so that when the boiler is in operation the maximum under-pressure is not exceeded (simultaneous operation)
- Use safety equipment that prevents simultaneous operation (alternate operation)
- Monitor the flue gas outlet using safety devices (such as a flue gas thermostat)

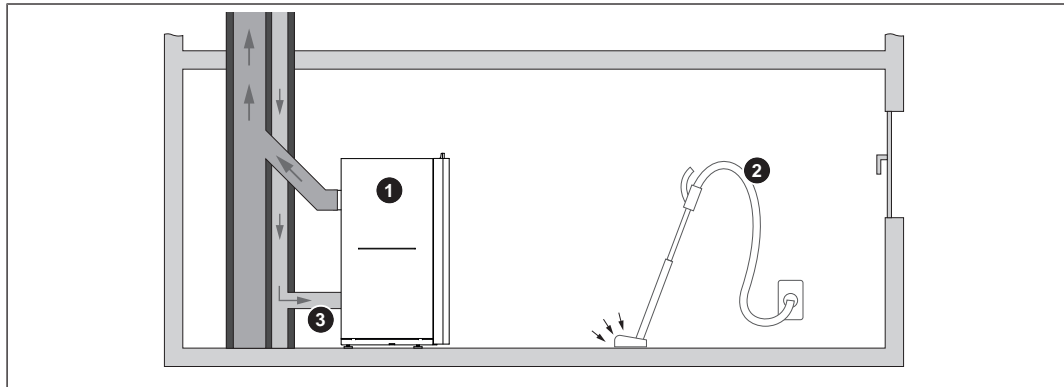
Simultaneous operation

An approved safety system (such as an air pressure monitor) ensures that during simultaneous operation of the boiler and the air-drawing appliance the pressure conditions are maintained. In the event of a fault, the safety system will switch off one of the air-drawing systems.

Alternating operation

An approved safety system (such as a flue gas thermostat) ensures (e.g. by switching off the power supply) that the boiler cannot be operated simultaneously with the air-drawing appliance.

3.6 Combustion air for room air-independent operation



1	Boiler
2	Air extraction system (such as centralised dust extraction system, room ventilation)
3	Combustion air supply from outside (irrespective of ambient air)

3.6.1 Definition of terms

There is 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 C₄₂ / type C₈₂ or according to DIBt as a type FC_{42x} / type FC_{52x}.

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 C₄ 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 C₈ 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" (C₄₂ / C₈₂) indicates type C boilers with a blower fan downstream of the combustion chamber or the heat exchanger.

Definitions as per DIBt

Type FC_{42x} 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_{52x} 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.

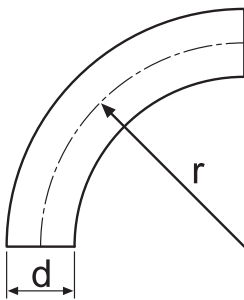
3.6.2 Supply air line

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

➡ "Overview of standards" [► 7]

- ☐ Connect the supply air line leak-tight to the connection on the boiler
- ➡ Refer to the dimensions of the supply air line connection on the boiler in the Technical Data

When dimensioning pipe bends in the supply air line, ensure that:



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

$$r:d \geq 1$$

For example:

- supply air line diameter = 160 mm
- minimum radius of pipe bends = 160 mm

- The supply air line should be as straight as possible and take the shortest path
- Keep the number of pipe bends to a minimum
- Max. resistance of the supply air line: 20 Pa

3.6.3 Condensation

NOTICE! The greater the difference between the temperature of the outside air being drawn in and the 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:

- ☐ Jacket the entire supply air line with suitable thermal insulation

3.7 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:

- ☐ 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 ¹⁾		Total hardness at >20 ≤50 l/kW minimum individual heat output ¹⁾		Total hardness at >50 l/kW minimum individual heat output ¹⁾	
kW	°dH	mol/m³	°dH	mol/m³	°dH	mol/m³
≤50	no demand or		11.2	2	0.11	0.02
	<16.8 ²⁾	<3 ²⁾				
>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

3.8 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.**

3.9 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.

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

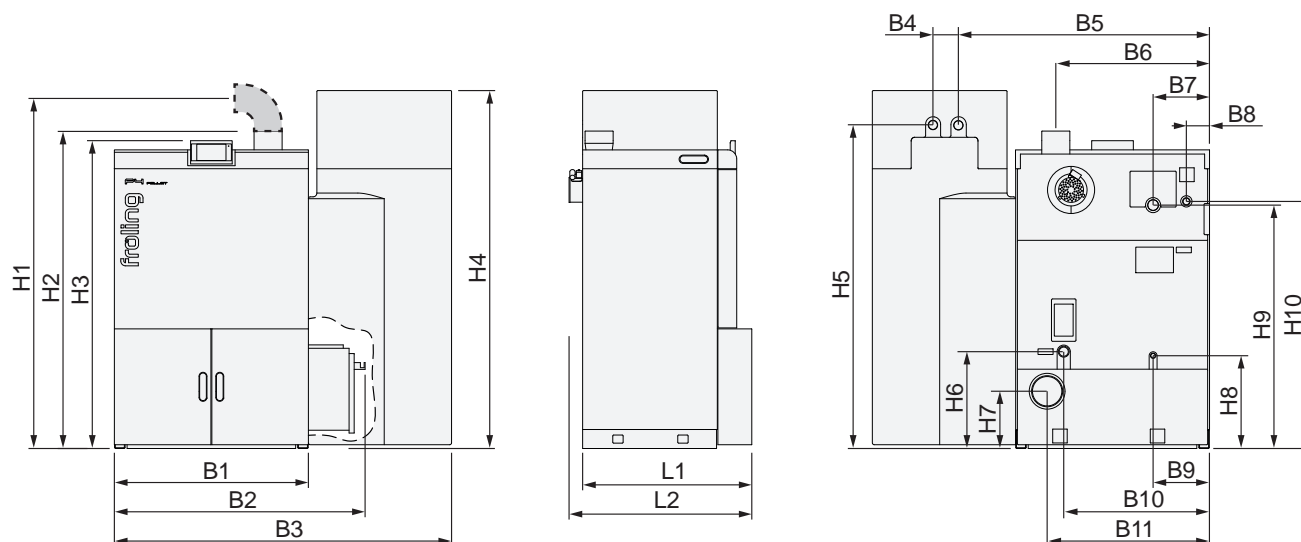
Tip: ☐ Fit a vertical pipe as a calming section in front of the automatic ventilating valve in such a way that the ventilating valve is positioned above the water level in the boiler

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

- ↳ Follow the manufacturer's instructions!

4 Technology

4.1 Dimensions P4 Pellet 45-105

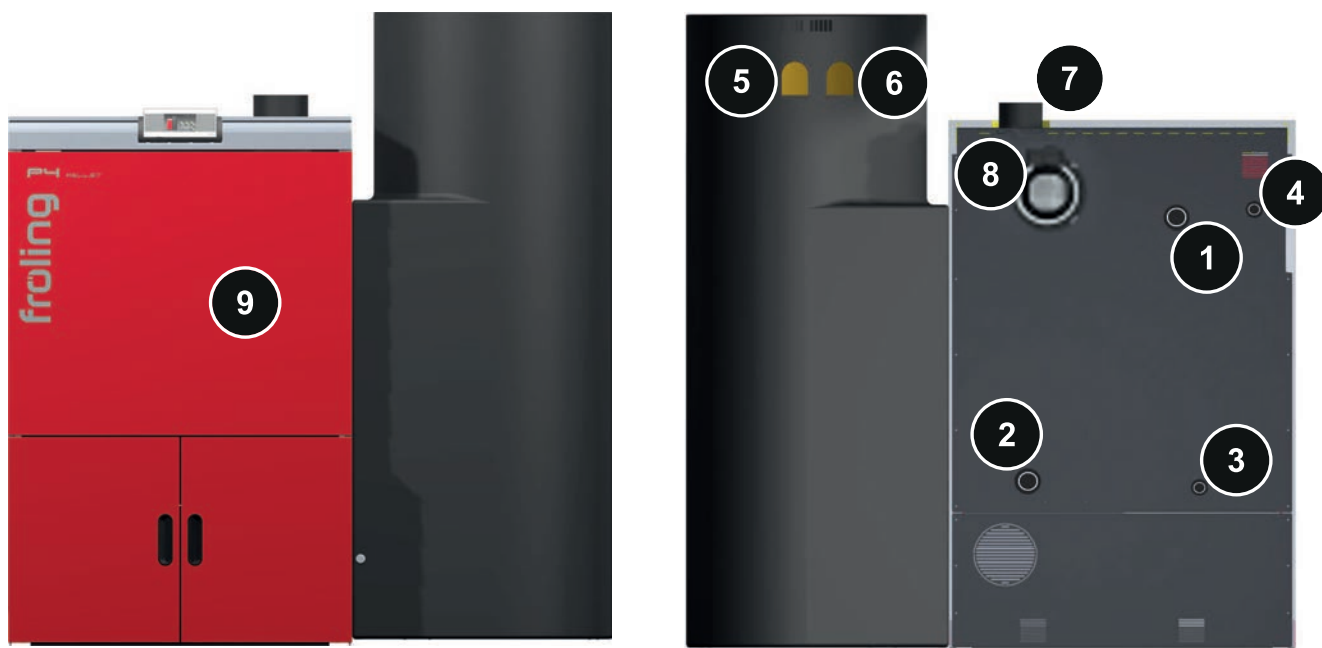
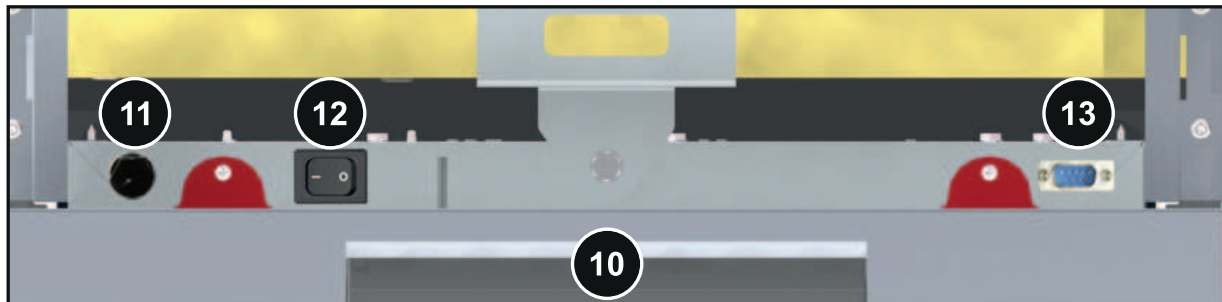


Dimension	Description	Unit	45 - 60	70 - 105
L1	Length of boiler	mm	900	990
L2	Total length incl. induced draught fan		970	1070
B1	Width, boiler		1030	1235
B2	Width of boiler including support		1330	1525
B3	Total width including suction cyclone		1790	2085
B4	Distance between hose line connections		135	135
B5	Distance between hose line connection and side of boiler		1335	1580
B6	Distance between flue gas pipe connection and side of boiler		815	1000
B7	Distance between flow connection and side of boiler		300	350
B8	Distance from venting connection to side of boiler		125	120
B9	Distance from drainage to side of boiler		300	350
B10	Distance between return connection and side of boiler		775	1000
B11	Distance from supply air connection (for room air independent operation)		860	1045
H1	Height, flue gas pipe connection ¹⁾		1790	-
H2	Height of boiler incl. flue gas nozzle		1685	1785
H3	Height, boiler		1635	1760
H4	Total height including suction cyclone		1900	1900
H5	Height of suction hoses connection		1715	1725
H6	Height, return connection		515	520
H7	Height of supply air connection (for room air independent operation)		305	315
H8	Height, drainage connection		495	520
H9	Height, flow connection		1295	1360
H10	Height, ventilation connection		1310	1430

1. When using the optional flue gas pipe nozzle for low chimney connections

4.2 Components and connections

4.2.1 P4 Pellet 45-105



Item	Description	45 - 60	70 - 105
1	Flow connection	6/4" IT	2" IT
2	Return connection	6/4" IT	2" IT
3	Drainage connection	1/2" IT	1" IT
4	Air vent connection	1" IT	1" IT
5	Pellet suction line (external diameter)	60 mm	60 mm
6	Pellet return air line (external diameter)	60 mm	60 mm
7	Flue gas pipe connection (external diameter)	149	199
8	Induced draught fan		
9	Controller box		
10	Lambdatronic P 3200 control		
11	High-limit thermostat (STL)		
12	Main switch		
13	Service interface		

4.3 Technical specifications

4.3.1 P4 Pellet 45 – 60

Description		P4 Pellet		
		45 ¹⁾	48	60
Nominal heat output	kW	45.0	48.0	58.5
Output range		13,5-45,0	14,4-48,0	17,6-58,5
Electrical connection		230 V / 50 Hz / C16A		
Electrical power consumption NL/PL	W	113 / 78	114 / 45	119 / 80
Boiler weight	kg	760		
Boiler capacity (water)	l	170		
Capacity, ash container heat exchanger/combustion chamber	l	33 / 33		
Water pressure drop (ΔT = 20K / 10K)	mbar	3.2 / 9.9	3.7 / 10.5	5.3 / 12.3
Min. Boiler return temperature	°C	Not applicable due to internal return temperature control		
Max. permitted operating temperature		90		
Min. operating temperature setting		40		
Permitted operating pressure	bar	3		
Boiler class as per EN 303-5:2012		5		
Airborne sound level	dB(A)	< 70		
Permitted fuel ²⁾		Fuel as per EN ISO 17225 – Part 2: wood pellets Class A1 / D06		
Test book number		13-U-584/ SD; 10-UW/Wels- EX-242 ³⁾	PB 013	PB 014

1. P4 Pellet 45 is only available in Great Britain.

2. Detailed information on the fuel can be found in the operating instructions in the section entitled "Permitted fuels"

3. TÜV AUSTRIA SERVICES GMBH, Industry & Energy Austria, Business Unit Environmental Protection, Wiener Bundesstraße 8, A-4060 Leonding

Regulation (EU) 2015/1187		P4 Pellet		
		45	48	60
Energy efficiency class of boiler		A+	A+	A+
Energy efficiency index (EEI) of boiler		122	119	119
Heating space annual rate of use η_s	%	83	81	81
Energy efficiency index (EEI) of boiler and controller combined		124	121	121
Energy efficiency class of boiler and controller combined		A+	A+	A+

Additional data for regulation (EU) 2015/1189

Description		P4 Pellet		
		45	48	60
Heating up mode		automatic		
Condensing boiler		No		

Description		P4 Pellet		
		45	48	60
Solid fuel boiler for combined heat and power		No		
Combined heating system		No		
Storage tank volume		➡ "Storage tank" [► 18]		
Characteristics when operated exclusively with the preferred fuel				
Useful heat delivered at rated heat output (P_n)	kW	45	46.5	58.1
Useful heat delivered at 30% of rated heat output (P_p)		11.7	13.5	17.2
Fuel efficiency at rated heat output (η_n)	%	85.3	85.2	84.8
Fuel efficiency at 30% of rated heat output (η_p)		87.3	84.8	85.0
Auxiliary current consumption at rated heat output ($e_{l_{max}}$)	kW	0.113	0.114	0.119
Auxiliary current consumption at 30% of rated heat output (η_p)		0.078	0.45	0.080
Auxiliary current consumption in standby mode (P_{SB})		0.008	0.008	0.007

Regulation (EU) 2015/1189 – emissions in [mg/m ³] ¹⁾	
Annual space heating emissions of dust (PM)	≤ 30
Annual space heating emissions of gaseous organic compounds (GOC)	≤ 20
Annual space heating emissions of carbon monoxide (CO)	≤ 380
Annual space heating emissions of nitrogen oxides (NO _x)	≤ 200

1. The emissions of dust, gaseous organic compounds, carbon monoxide and nitrogen oxides are stated in a standardised form based on dry flue gas with a oxygen content of 10 % and under standard conditions at 0°C and 1013 millibar

4.3.2 P4 Pellet 70 – 105

Description		P4 Pellet				
		70 ¹⁾	80	100	100 ²⁾	105 ³⁾
Nominal heat output	kW	69.0	80.0	100.0	99.0	105.0
Output range		20,7-69	24-80	30-100	29,7-99	31,5-105
Electrical connection		230 V / 50 Hz / C16A				
Electrical power consumption NL/PL	W	117 / 72	115 / 49	112 / 49	112 / 49	112 / 49
Boiler weight	kg	1090	1090	1100	1100	1100
Boiler capacity (water)	l	280	280	280	280	280
Capacity, ash container heat exchanger/combustion chamber	l	33 / 33	33 / 33	33 / 33	33 / 33	33 / 33
Water pressure drop (ΔT = 20K / 10K)	mbar	5.0 / 12.8	4.8 / 14.3	4.3 / 14.3	4.3 / 14.3	4.3 / 14.3
Min. Boiler return temperature	°C	Not applicable due to internal return temperature control				
Max. permitted operating temperature		90				
Min. operating temperature setting		40				
Permitted operating pressure	bar	3				
Boiler class as per EN 303-5:2012		5				

Description		P4 Pellet				
		70 ¹⁾	80	100	100 ²⁾	105 ³⁾
Airborne sound level	dB(A)	< 70				
Permitted fuel ⁴⁾		Fuel as per EN ISO 17225 – Part 2: wood pellets Class A1 / D06				
Test book number		14- U-188/ SD; 14- UW/ Wels- EX-024 ⁵⁾	PB 018	PB 019	10-UW/ Wels- EX-242/5 ⁵⁾	PB 020
1. P4 Pellet 70 is only available in France. 2. P4 Pellet 100 (99 kW) is only available in Great Britain. 3. P4 Pellet 105 is only available in Germany. 4. Detailed information on the fuel can be found in the operating instructions in the section entitled "Permitted fuels" 5. TÜV AUSTRIA SERVICES GMBH, Industry & Energy Austria, Business Unit Environmental Protection, Wiener Bundesstraße 8, A-4060 Leonding						

Regulation (EU) 2015/1187		P4 Pellet				
		70	80	100	100 (99 kW)	105
Energy efficiency class of boiler		A+	-			
Energy efficiency index (EEI) of boiler		120	-			
Heating space annual rate of use η_s	%	82	≥ 78			
Energy efficiency index (EEI) of boiler and controller combined		122	-			
Energy efficiency class of boiler and controller combined		A+	-			

Additional data for regulation (EU) 2015/1189

Description		P4 Pellet				
		70	80	100	100 (99 kW)	105
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" ▶ 18]				
Characteristics when operated exclusively with the preferred fuel						
Useful heat delivered at rated heat output (P_n)	kW	69	79.5	99.4	99	99.4
Useful heat delivered at 30% of rated heat output (P_p)		18.9	23.7	23.7	23.7	23.7
Fuel efficiency at rated heat output (η_n)	%	85.4	86.0	87.1	87.1	87.1
Fuel efficiency at 30% of rated heat output (η_p)		85.4	86.5	86.5	86.5	86.5
Auxiliary current consumption at rated heat output ($e_{l_{max}}$)	kW	0.117	0.115	0.112	0.112	0.112
Auxiliary current consumption at 30% of rated heat output (η_p)		0.072	0.049	0.049	0.049	0.049
Auxiliary current consumption in standby mode (P_{SB})		0.008	0.009	0.010	0.010	0.010

Regulation (EU) 2015/1189 – emissions in [mg/m ³] ¹⁾	
Annual space heating emissions of dust (PM)	≤ 30
Annual space heating emissions of gaseous organic compounds (GOC)	≤ 20
Annual space heating emissions of carbon monoxide (CO)	≤ 380
Annual space heating emissions of nitrogen oxides (NO _x)	≤ 200
1. The emissions of dust, gaseous organic compounds, carbon monoxide and nitrogen oxides are stated in a standardised form based on dry flue gas with a oxygen content of 10 % and under standard conditions at 0°C and 1013 millibar	

4.3.3 Boiler data for planning the flue gas system

Description		P4 Pellet		
		45 ¹⁾	48	60
Flue gas temperature at nominal load	°C	160		170
Flue gas temperature at partial load		100		
CO ₂ - volume concentration at nominal load / partial load	%	12 / 9	12 / 9	
Flue gas mass flow at nominal load	kg/h	126	140	155
	kg/s	0.035	0.039	0.043
Flue gas mass flow at partial load	kg/h	58	61	68
	kg/s	0.016	0.017	0.019
Required feed pressure at nominal load	Pa	8		
	mbar	0.08		
Required feed pressure at partial load	Pa	6		
	mbar	0.06		
Maximum permissible feed pressure	Pa	30		
	mbar	0.3		
Flue pipe diameter	mm	149		
Combustion air volume at nominal load	m ³ /h	80	85	104
1. P4 Pellet 45 is only available in Great Britain.				

Description		P4 Pellet			
		70 ¹⁾	80	100	105 ²⁾
Flue gas temperature at nominal load	°C	160		170	
Flue gas temperature at partial load		100			
CO ₂ - volume concentration at nominal load / partial load	%	12 / 9			
Flue gas mass flow at nominal load	kg/h	198	216	274	284
	kg/s	0.055	0.060	0.076	0.079
Flue gas mass flow at partial load	kg/h	72	76	94	101
	kg/s	0.020	0.021	0.026	0.028
Required feed pressure at nominal load	Pa	8			
	mbar	0.08			
Required feed pressure at partial load	Pa	6			

Description		P4 Pellet			
		70 ¹⁾	80	100	105 ²⁾
	mbar	0.06			
Maximum permissible feed pressure	Pa	30			
	mbar	0.3			
Flue pipe diameter	mm	199			
Combustion air volume at nominal load	m³/h	123	141	177	178
1. P4 Pellet 70 is only available in France. 2. P4 Pellet 105 is only available in Germany.					

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.

4.3.4 Airborne sound level

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

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

Ambient level for measurement: 32 dBA

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

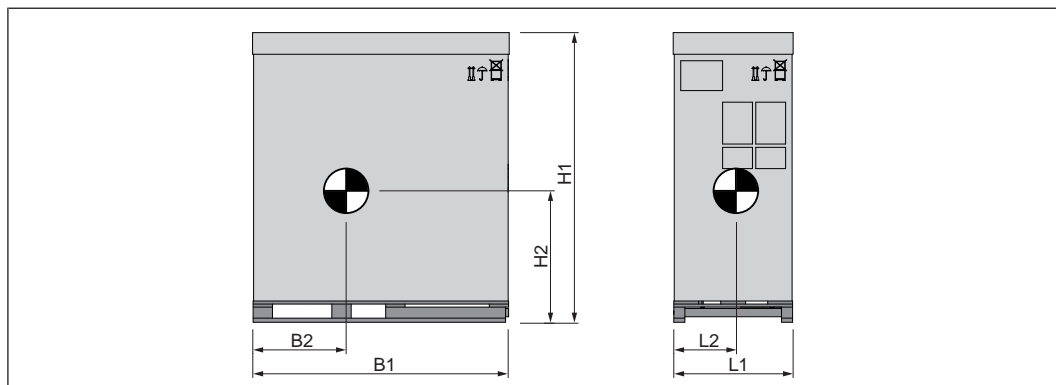
Please note that all the measurements were taken in-house and do not come from a certified test centre. This data should, therefore, be viewed as individual guideline measurements.

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

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

5 Transport and storage

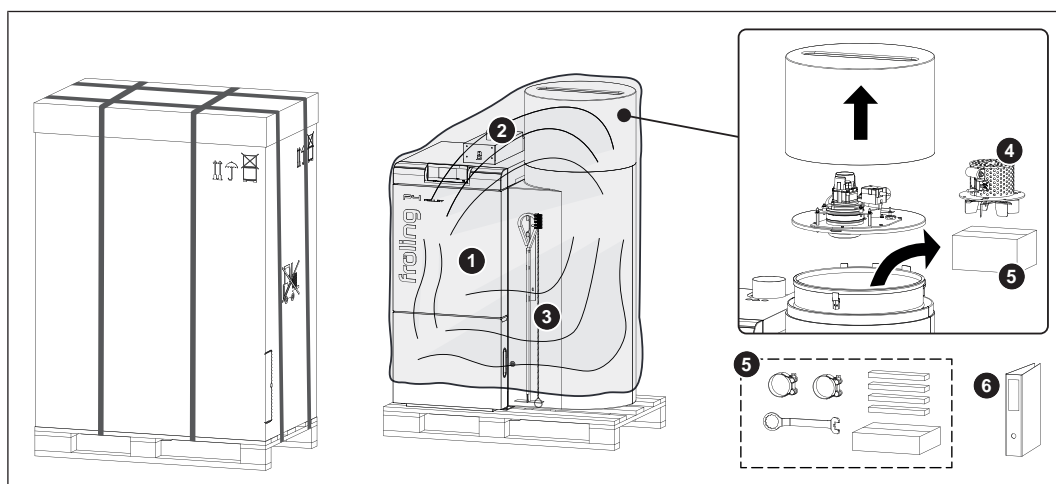
5.1 Delivery configuration



Item	Description	Unit	P4 Pellet	
			45-60	80-105
L1	Length	mm	870	960
L2	Distance from centre of gravity		420	460
B1	Width		1860	2150
B2	Distance from centre of gravity		700	790
H1	Height		2100	2230
H2	Distance from centre of gravity		890	945
-	Weight	kg	820	1145

5.2 Materials supplied

The boiler comes pre-assembled on a pallet in cardboard packaging.



1	Pre-assembled boiler	4	ID fan (in the cyclone container)
2	Insulated doors and ash container	5	Accessories package (in the suction cyclone container)
3	Cleaning devices	6	installation and operating instructions, guarantee certificate, identification plate

5.3 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!

5.4 Positioning

NOTICE



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

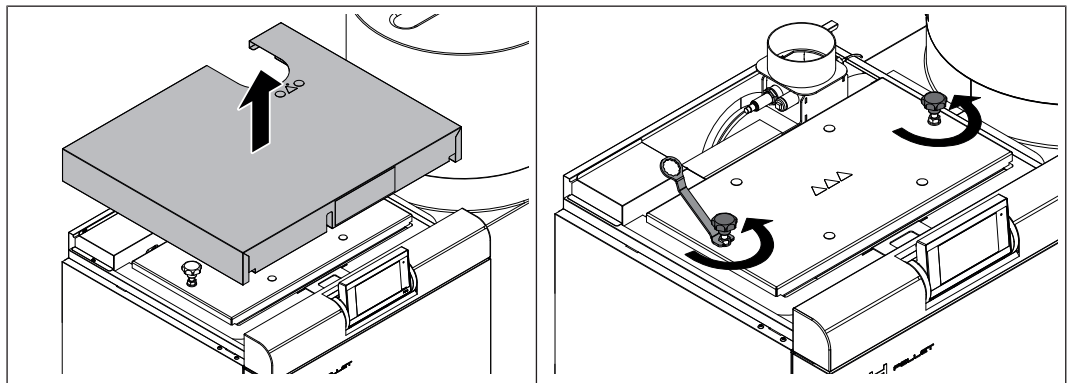
If the boiler cannot be brought in on the pallet:

- ☐ Remove the cardboard and remove the boiler from the pallet
 - ↳ "Remove boiler from pallet" [▶ 36]

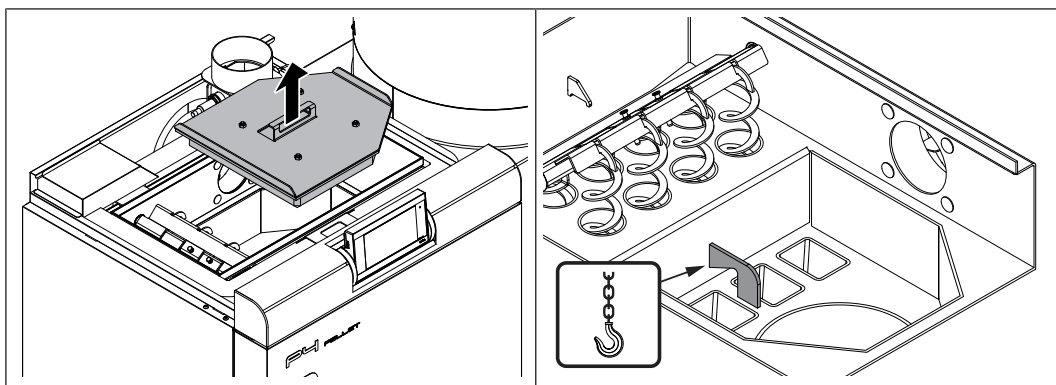
If because of the difficult location the boiler cannot be installed:

- ↳ "Dismantling for location where positioning is difficult" [▶ 29]

Positioning using a crane:



- ☐ Remove the top cover
- ☐ Loosen the locking screws on the heat exchanger cover
- ☐ Remove the heat exchanger cover



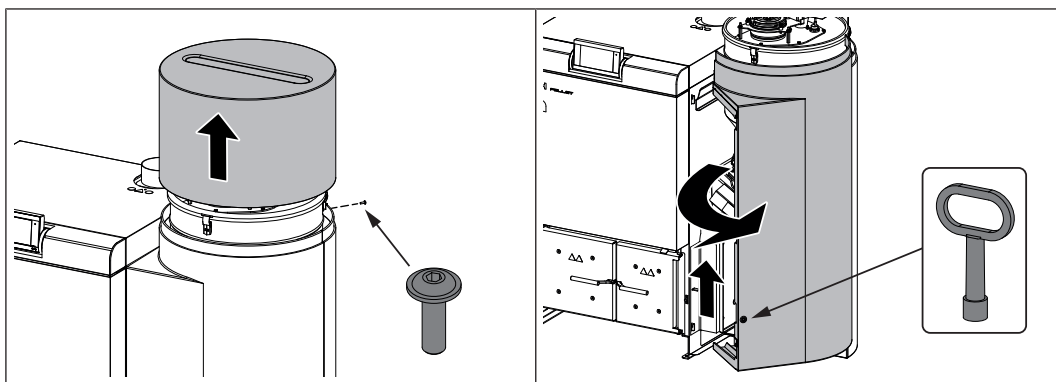
- ☐ Remove the combustion chamber
- ☐ Attach the crane hook to the attachment point correctly and position the boiler

5.5 Dismantling for location where positioning is difficult

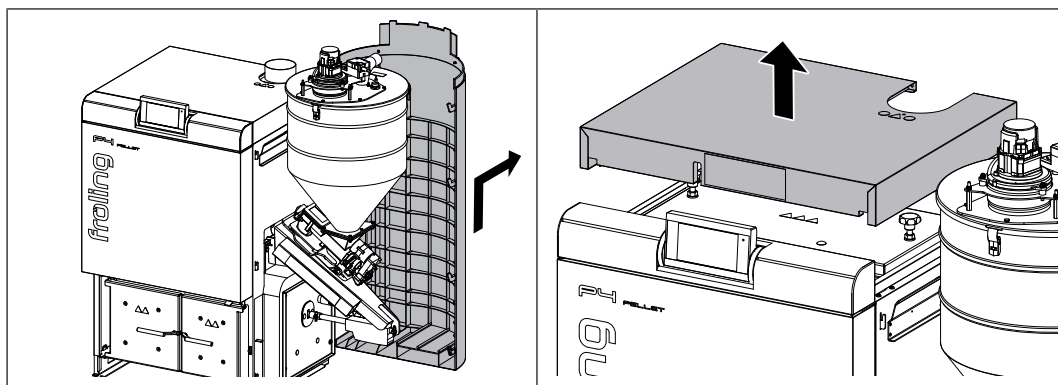
If there is not enough room to bring in the pre-assembled boiler, certain components can be dismantled.

NOTICE! Only take those steps absolutely necessary to bring in the boiler.

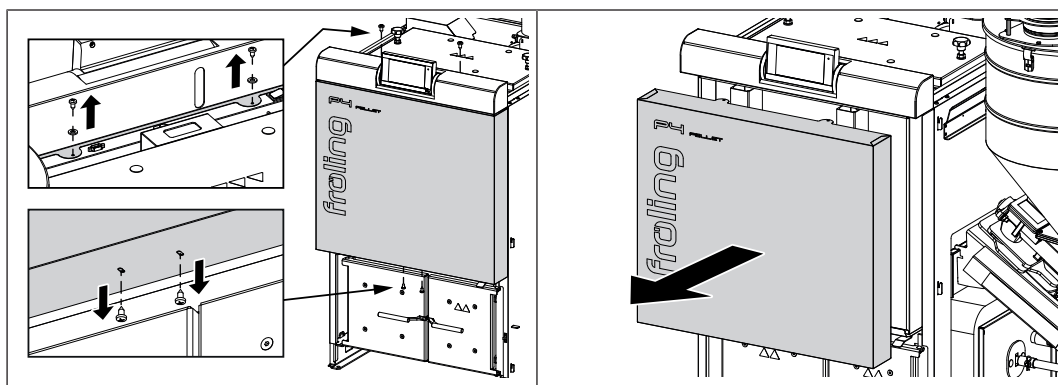
5.5.1 Removing the stoker assembly and insulation



- ☐ Remove the locking screws on the sound insulation hood of the stoker assembly and remove the sound insulation hood
- ☐ Use square spanner to unlock stoker assembly
 - ↳ The spanner is in the controller box
- ☐ Lift the front part of the stoker assembly up and pull it forwards to remove

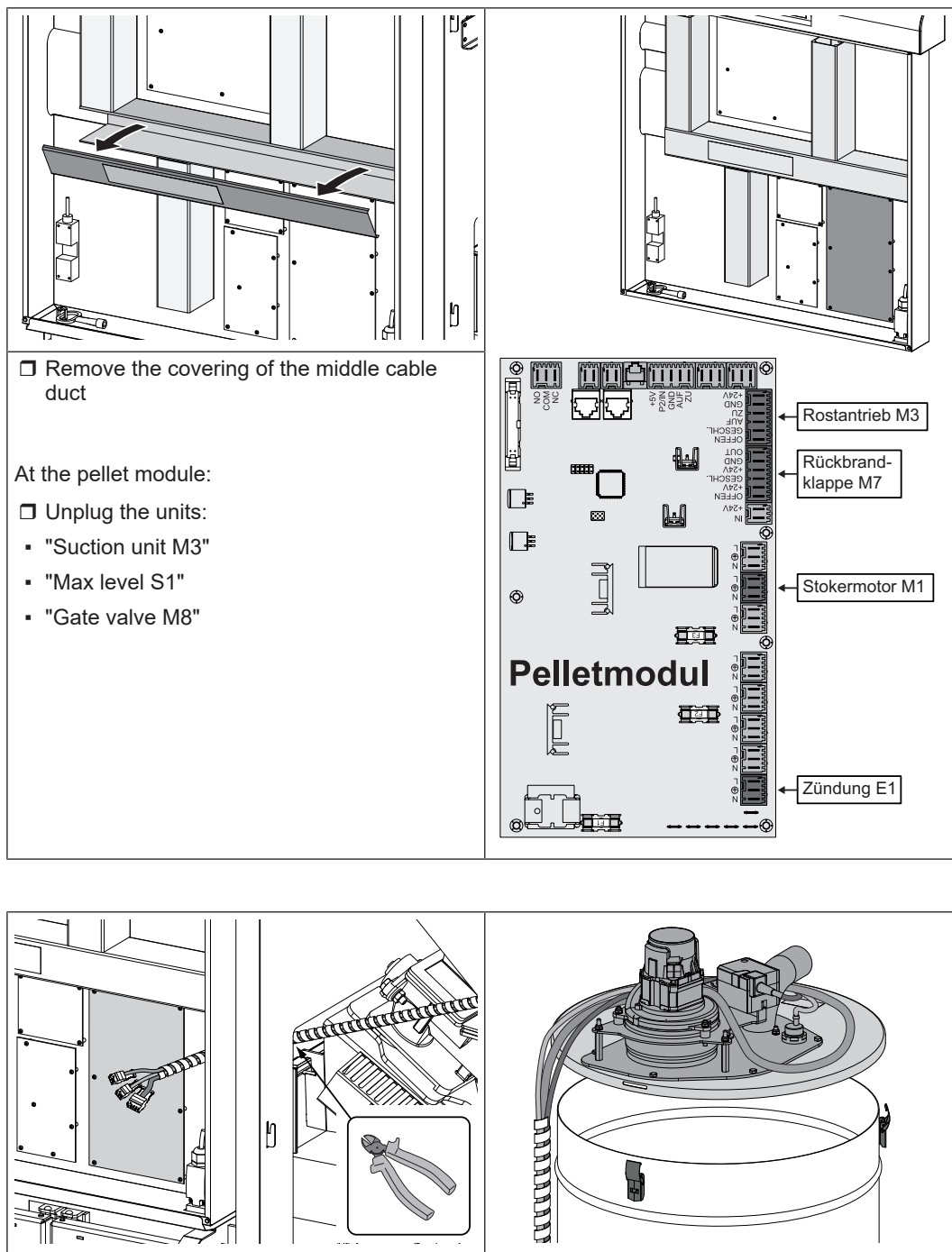


- ☐ Lift the back part of the stoker assembly up and pull backwards to remove
- ☐ Remove the insulating cover

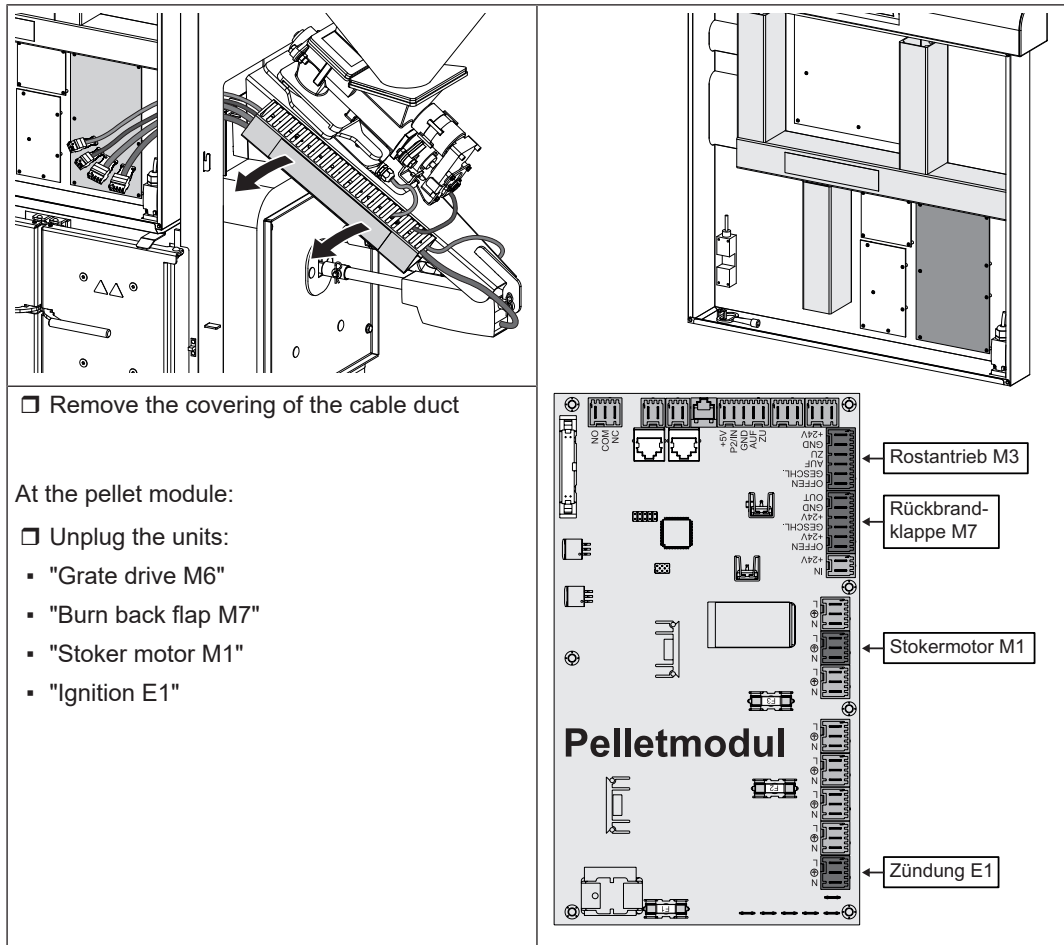


- ☐ Remove the two screws and contact washers from the flaps of the controller cover
 - ⚠ Caution: do not lose the contact washers!
- ☐ Remove the screw and contact washer on the bottom of the controller cover
- ☐ Remove the controller cover

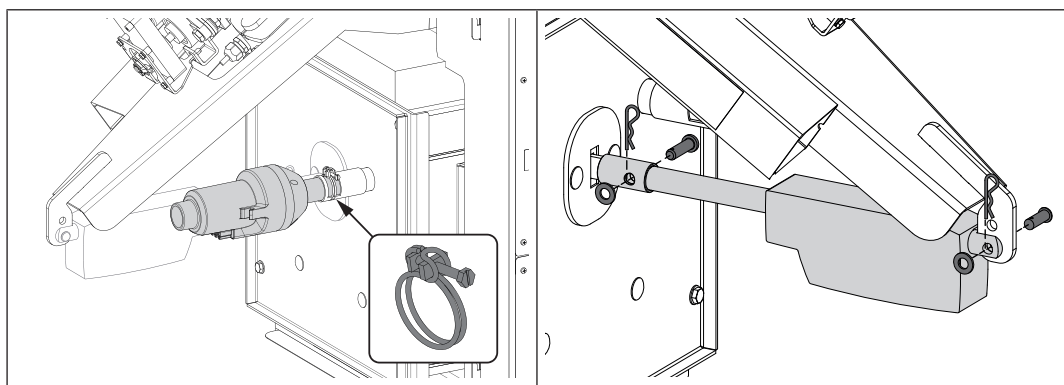
5.5.2 Dismantling the suction cyclone cover



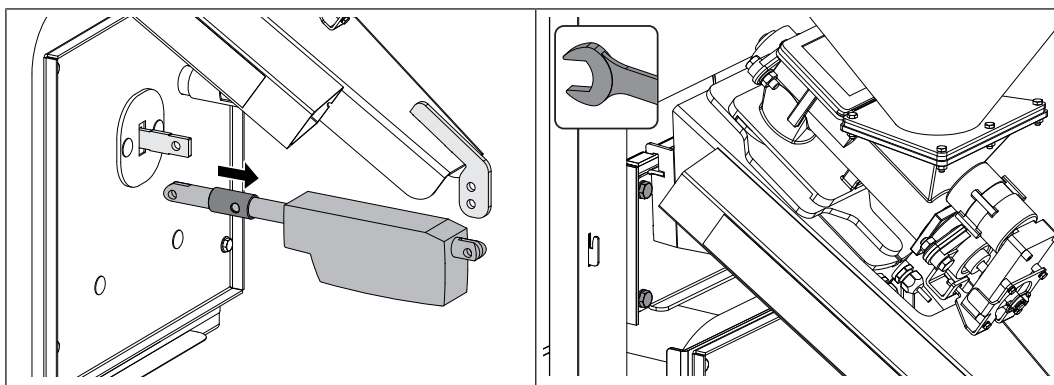
5.5.3 Dismantling the stoker unit



❑ Pull out the cables of the unplugged units



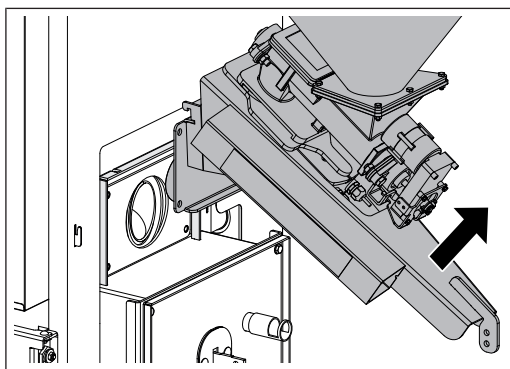
- ❑ Undo the screw and remove the clamp on the ignition blower fan
- ❑ Remove the ignition fan
- ❑ Remove the spring cotter at the front and back of the grate drive and remove the bolts



- ☐ Push the sleeve on the grate rod back
- ☐ Remove the grate motor
- ☐ Push the heat insulation mat aside slightly and remove two screws each from the right and left of the flange of the stoker unit
 - ↳ You can remove the screws completely as the stoker unit is secured to the boiler with two hooks

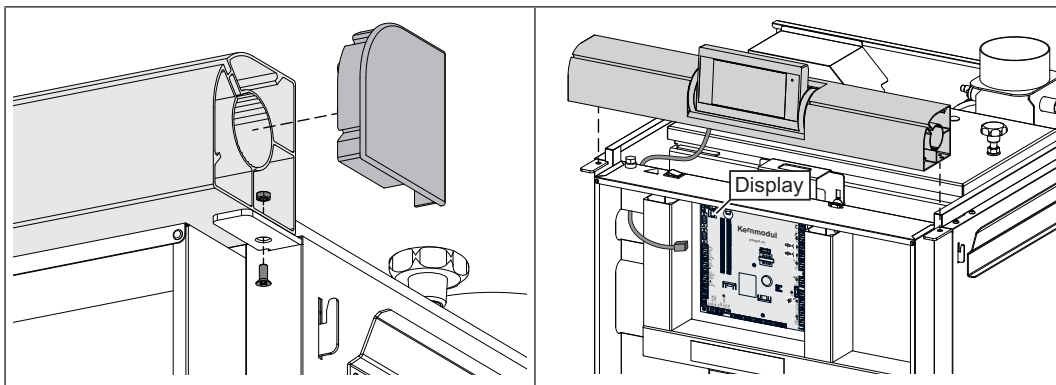
NOTICE! The following steps require two people:

P4 Pellet	Weight, stoker unit
45-60	approx. 46 kg
70-105	approx. 68 kg



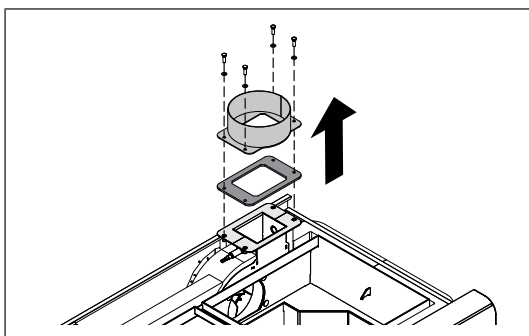
- ☐ Pull the stoker unit up slightly until the hooks come out of the stoker flange
- ☐ Tip the unit back slightly and lift it away

5.5.4 Installing the control



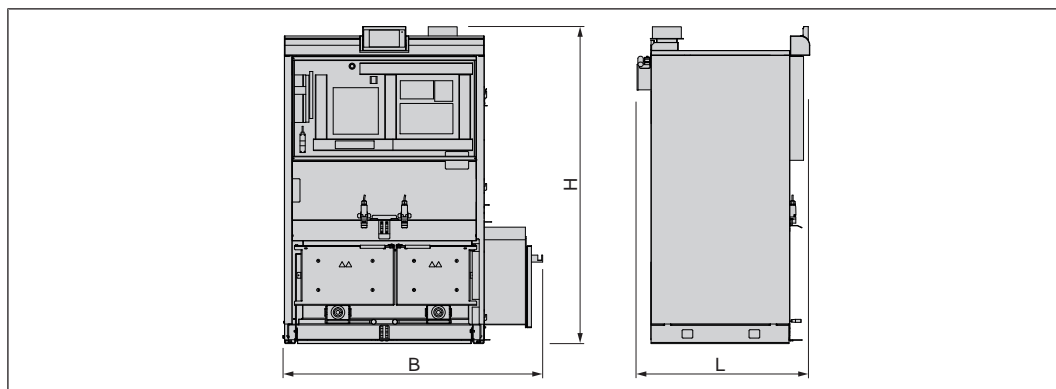
- ☐ Remove the left and right end caps
- ☐ Remove the screws on the right and left of the control
- ☐ Unplug the cable marked “Display” and pull it up out of the controller
- ☐ Remove the control

5.5.5 Remove the flue gas nozzle (P4 Pellet 70-105)



- ☐ Undo four screws
- ☐ Remove the flue gas nozzle and seal

5.5.6 Positioning dimensions after dismantling

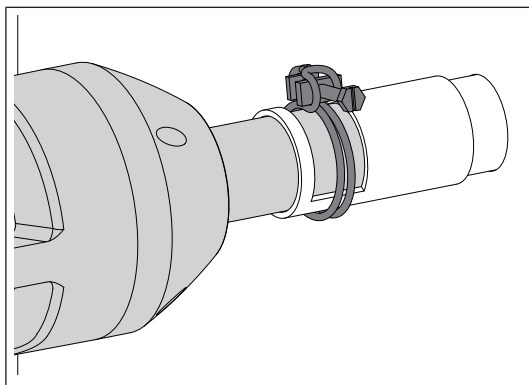


Item	Description	Unit	P4 Pellet	
			45-60	70-105
L	Length	mm	780	880
W	Width		1275	1480
H	Height		1685	1700
-	Weight	kg	580	850

5.5.7 Instructions for reassembly

- ❑ After positioning, reassemble the boiler in the reverse order

At installation of the ignition fan, take care

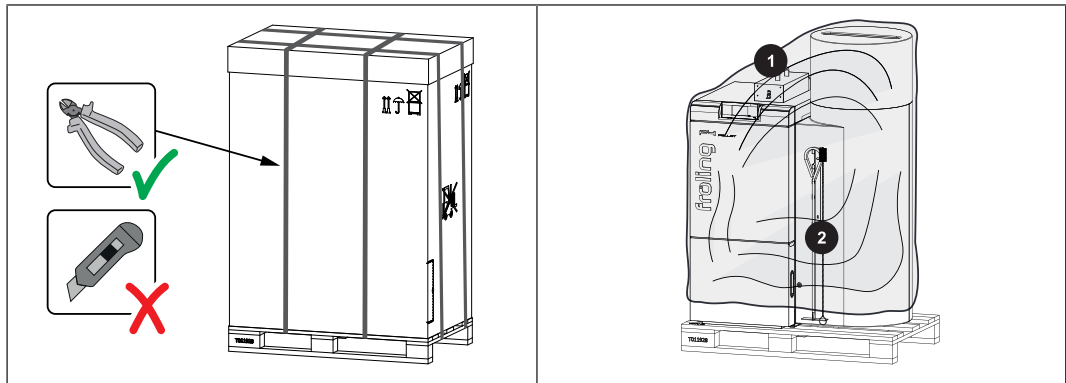


- ❑ Use a clamp to fix the ignition fan to the igniter tube
 - ↪ Fix the cable with the cable ties supplied.
 - ↪ There must be no loose cables in the ignition area
 - ↪ Do not connect the power supply until installation is complete!

NOTICE! The individual units should be checked by a qualified technician and adjusted if necessary during initial start-up.

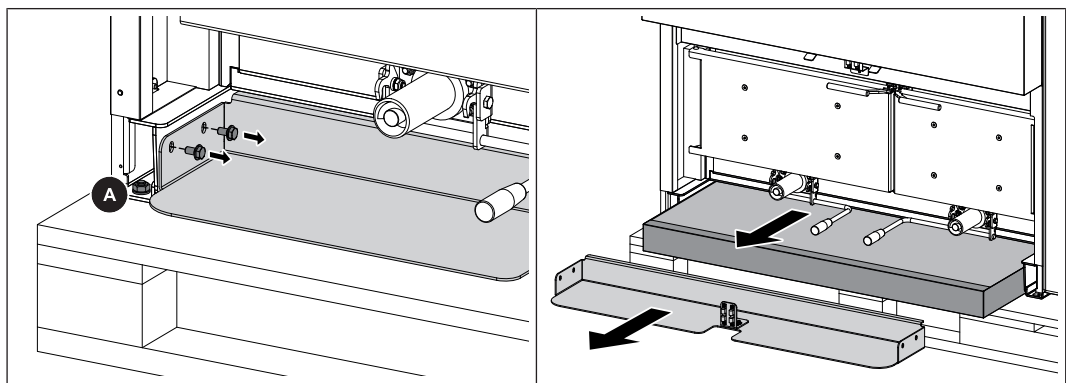
5.6 Positioning at the installation site

5.6.1 Remove boiler from pallet

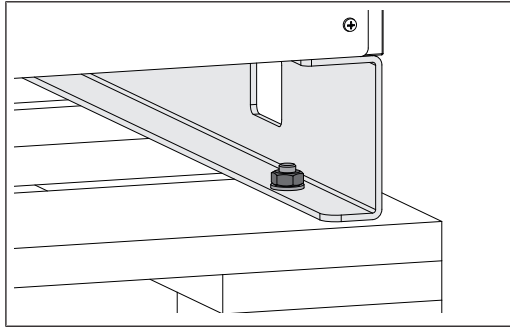


- ☐ Remove packing bands with suitable tools
- ☐ Lift off the cardboard box
- ☐ Remove the insulated doors and ash container (1) and also the cleaning devices (2)
- ☐ Remove the protective casing

At the front of the boiler:



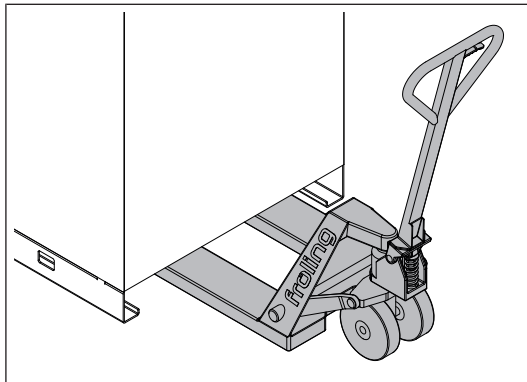
- ☐ Remove securing devices (A) used during transportation on the left and right side of the base
- ☐ Remove two screws each on the left and right of the ash collecting plate and remove the collecting plate
- ☐ Pull out the floor insulation behind

At the back of the boiler:

- ☐ Remove securing devices used during transportation on the left and right side of the base
- ☐ Lift boiler from pallet
 - ↳ **IMPORTANT:** Do not lift the boiler by the stoker assembly!



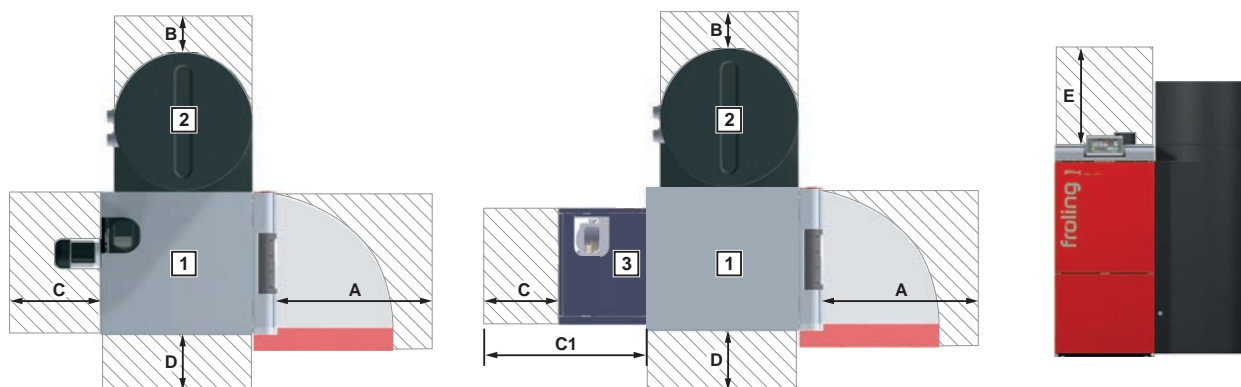
TIP: use Froling's KHV 1400 boiler lifting system to help remove the pallet!



- ☐ 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!

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)



1 ... pellet boiler P4 Pellet | 2 ... stoker assembly | 3... condensing boiler heat exchanger
All information in mm

	P4 Pellet	
	45-60	10-105
A	490 mm	590 mm
W	300 mm	
C	300 mm	
C1	450 mm	-
D	200 mm	
E	500 mm ²⁾	

1. When using the insertable insulated door (optional)

2. Maintenance area to expand the WOS springs upwards

6 Assembly

6.1 Tools required

The following tools are required for assembling the boiler:

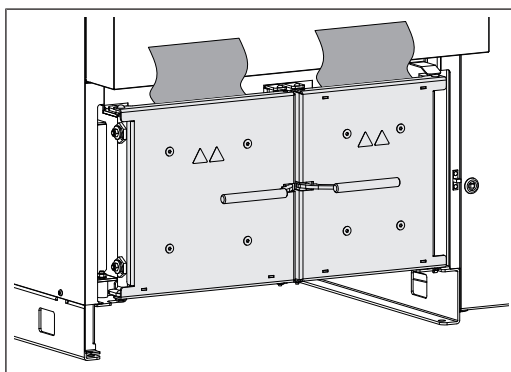
- ☐ Socket set
- ☐ Spanner or box wrench set
- ☐ Set of Torx bits (T20, T25, T30)
 - ↳ Using a cordless screwdriver is recommended
- ☐ Diagonal cutting pliers
- ☐ Flat head and cross-head screwdrivers
- ☐ Hammer

6.2 Assembling the pellet boiler

6.2.1 Before Installation

Checking the seal of the ash doors

- ☐ Open the door



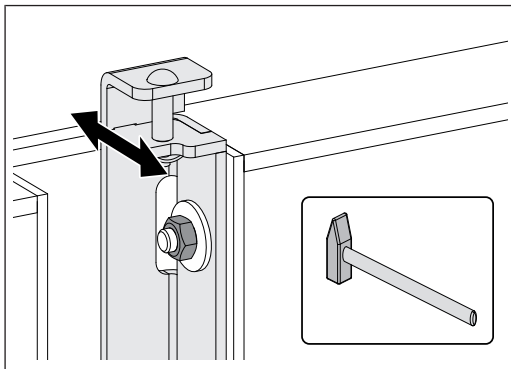
- ☐ Insert a sheet of paper at the top between the door and boiler
- ☐ Close the door
- ☐ Try to pull out the sheets of paper
 - ↳ If the paper cannot be removed:
The door seal is OK and the settings are correct
 - ↳ If the paper can be removed:
The door is not sealed properly and must be adjusted.
- ☐ Check the seal again after positioning the doors
- ☐ Repeat the procedure at the bottom of the ash door and on the side of the door handle above and below the door handle as well as at the same positions on the other ash door

Adjusting the doors

On the side with the door stop:

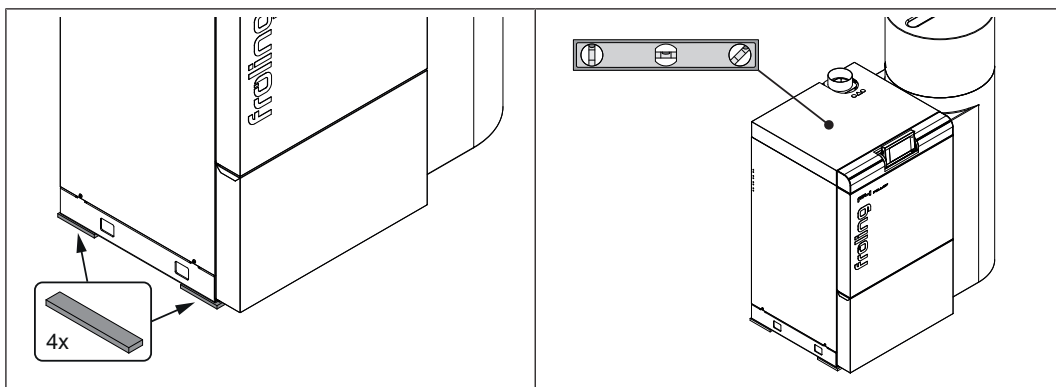
- ☐ Adjust the doors with the locking cam as explained above

On the side with the door handle:



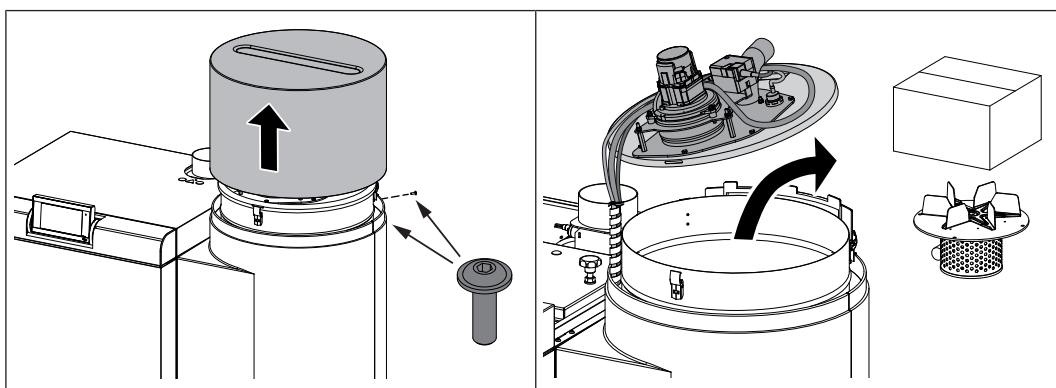
- ☐ Loosen the lock nuts at the top and bottom of the locking plate using an Allen key (SW 13 mm)
- ☐ Close the door
 - ✎ With a gap of approx. 2 to 3 cm there should be a noticeable resistance
- ☐ If the resistance is too low or too high, move the locking plate backwards or forwards using appropriate tools (e.g. screwdriver and hammer)
 - ✎ Caution: The locking plate must be aligned at the top and bottom.
- ☐ Close the door
- ☐ If the door will not close, move the locking plate forward slightly
 - ✎ Caution: The locking plate must be aligned at the top and bottom.
- ☐ Secure the lock nuts again

6.2.2 Aligning the boiler

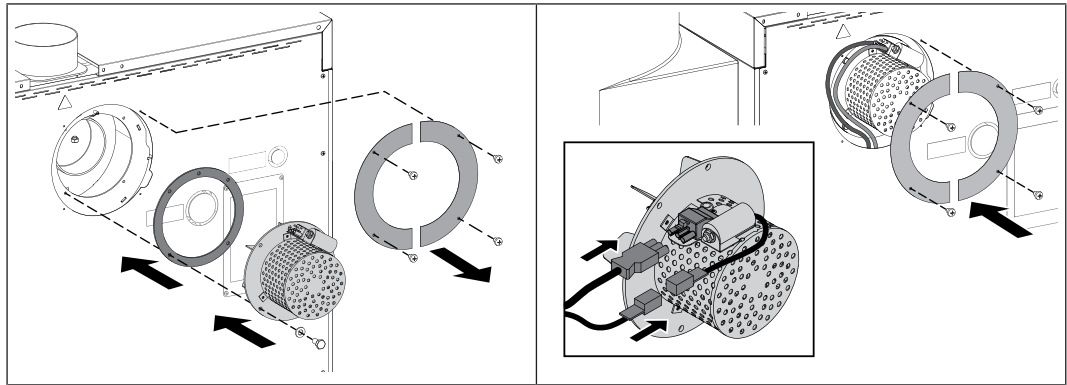


- ☐ Lift the boiler using an appropriate lifting device
- ☐ Position a Sylomer pad under the boiler base
 - ↳ Sylomer pads prevent the transmission of noise to the ground
- ☐ Carefully release the lifting device and check that the boiler is level
- ☐ If necessary, level the boiler using load-bearing pads

6.2.3 Fitting the induced draught fan

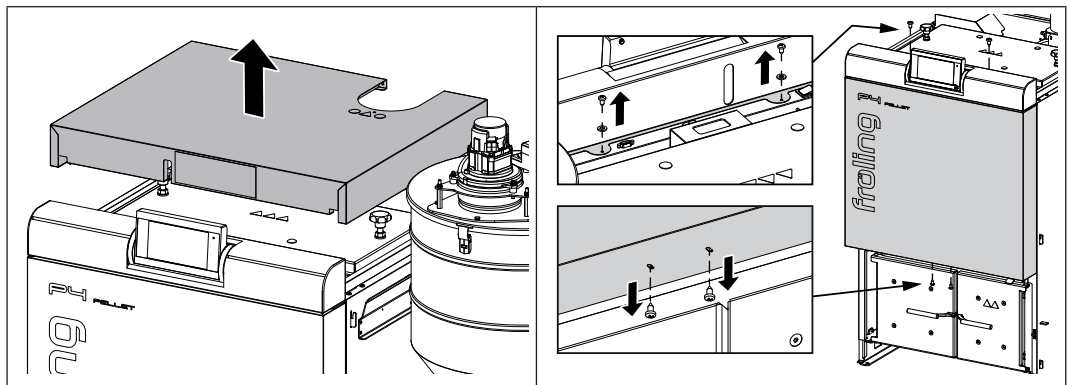


- ☐ Remove the locking screws on the sound insulation hood of the stoker assembly and remove the sound insulation hood
- ☐ Open the clamps on the suction cyclone container and remove the cover
- ☐ Remove the cardboard containing the induced draught fan and accessories package from the suction cyclone container

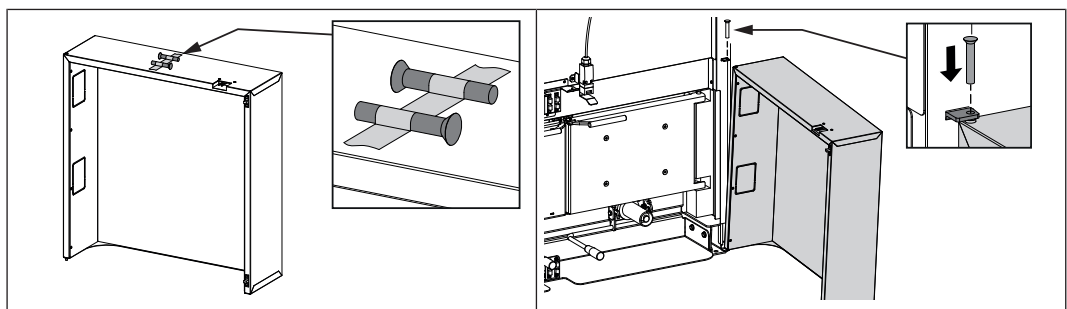


- ☐ Remove the pre-assembled induced draught cover plates
- ☐ Remove the pre-assembled nuts and spacer washers for induced draught
- ☐ Attach and fit the ID fan as illustrated
- ☐ Join the two cables of the ID fan with the pre-installed cables
- ☐ Push the cable behind the cladding and replace the induced draught cover plates.
- ☐ Slide the floor insulation under the boiler

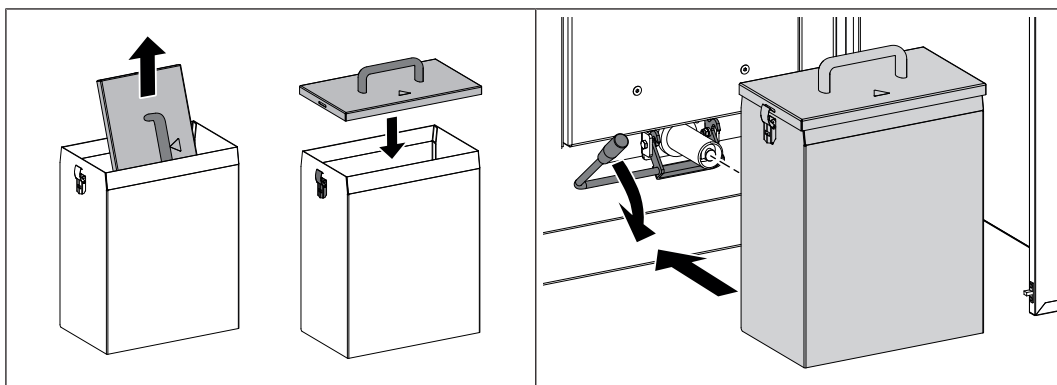
6.2.4 Fit the ash container and doors



- ☐ Remove the insulating cover
- ☐ Remove the two screws and contact washers from the flaps of the controller cover
 - ↳ Caution: do not lose the contact washers!
- ☐ Remove the screw and contact washer on the bottom of the controller cover
- ☐ Remove the controller cover



- ☐ Remove the adhesive tape and lock bolt from the insulated door
- ☐ Hang the insulated door to the boiler base and secure on top side with lock bolt



- ☐ Take the two covers for the ash containers out of the ash containers, position and secure with clamps
- ☐ Put the left and right ash containers onto the ash screws and secure with lever
- ☐ Replace the controller cover after connecting to the power supply

6.3 Installing the discharge system

6.3.1 Fit the suction hoses to the boiler

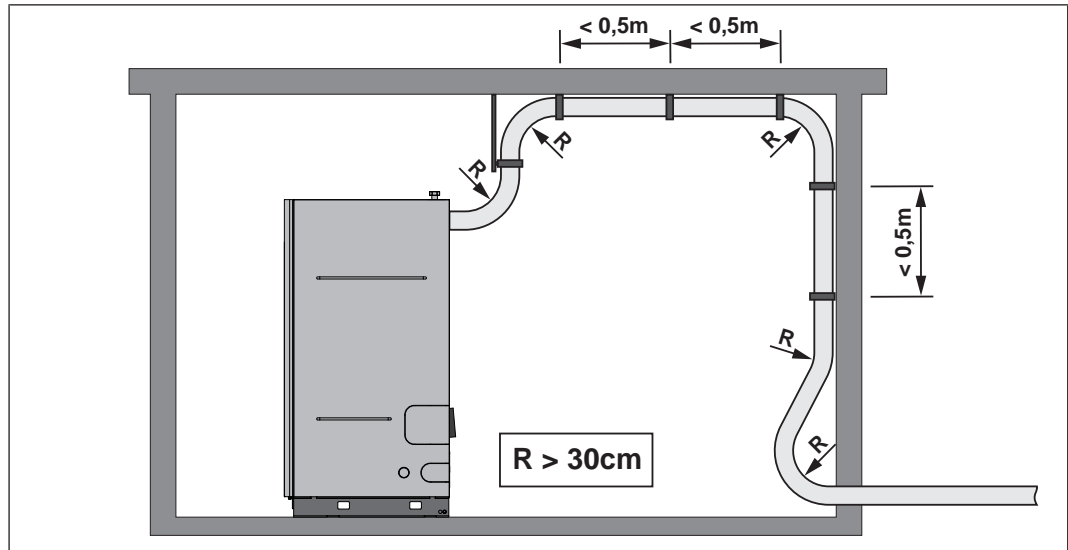
- ☐ Fit the discharge system according to the installation instructions enclosed



- ☐ Connect the suction hose and return air line at the back of the boiler:
 - ↳ Left port (1) = suction hose (Pellets sticker)
 - ↳ Right port (2) = return air line

NOTICE! When connecting the lines, pay attention to equipotential bonding, ➡
["Assembly information for hose lines" \[► 44\]](#)

6.3.2 Assembly information for hose lines

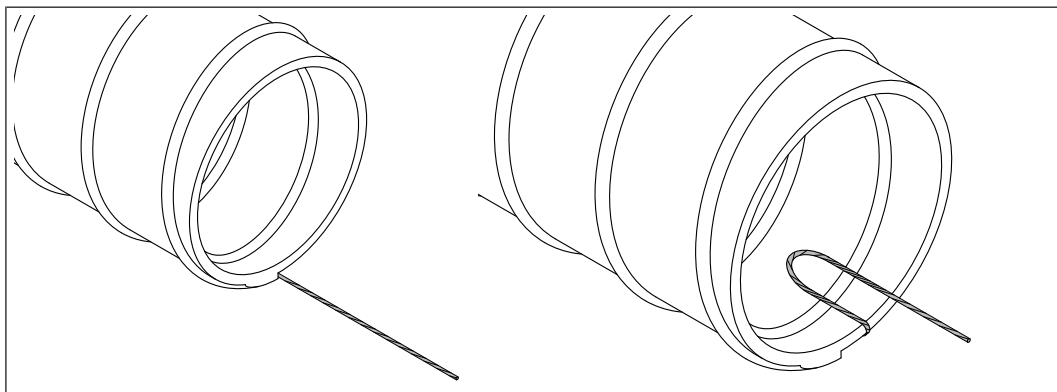


Please note the following with regard to the hose lines used in Froling vacuum discharge systems:

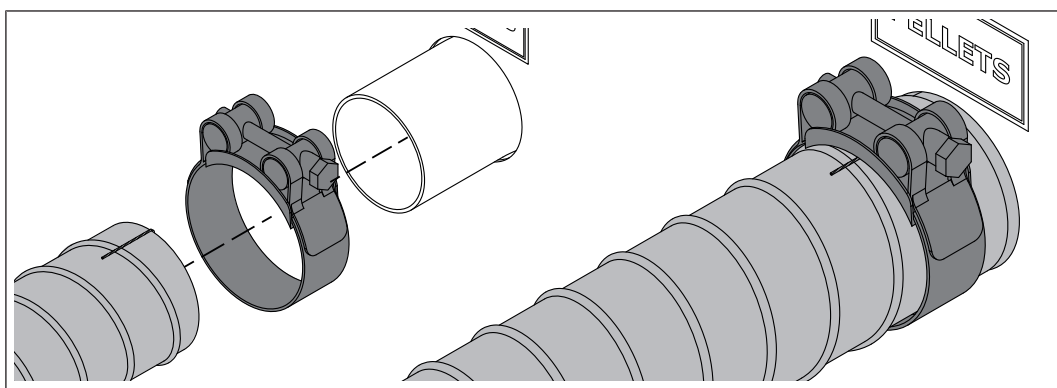
- Do not kink the hose lines! Minimum bending radius = 30cm
- Lay the hose lines as straight as possible! Sagging lines can lead to so-called “pockets”, which may cause problems with the pellet feed.
- Lay the hose lines in short sections away from walking areas.
- Hose lines are not UV-proof. Therefore: 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

6.4 Power connection and wiring

DANGER

When working on electrical components:

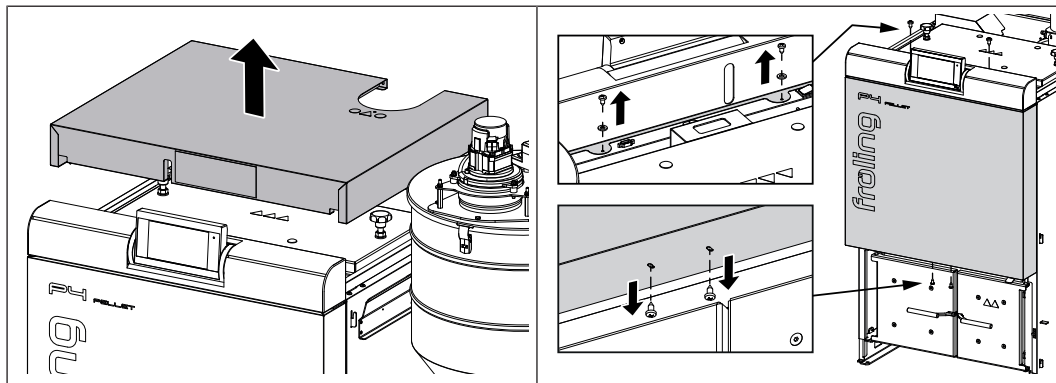
Risk of electrocution!

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

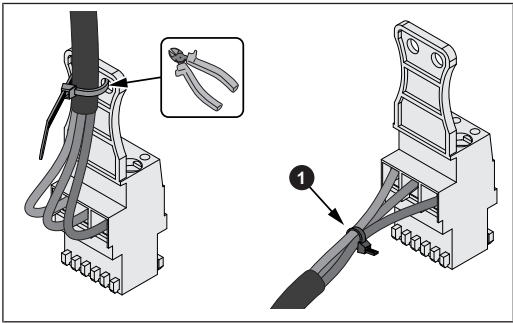


- ☐ Remove the insulating cover
- ☐ Remove the two screws and contact washers from the flaps of the controller cover
- ☐ Open the insulated doors
- ☐ Remove the screw and contact washer on the bottom of the controller cover
- ☐ Remove the controller cover

- ☐ Wire the connections in accordance with the circuit diagram
 - ↳ For circuit diagrams see operating instructions for "Lambdatronic P 3200"

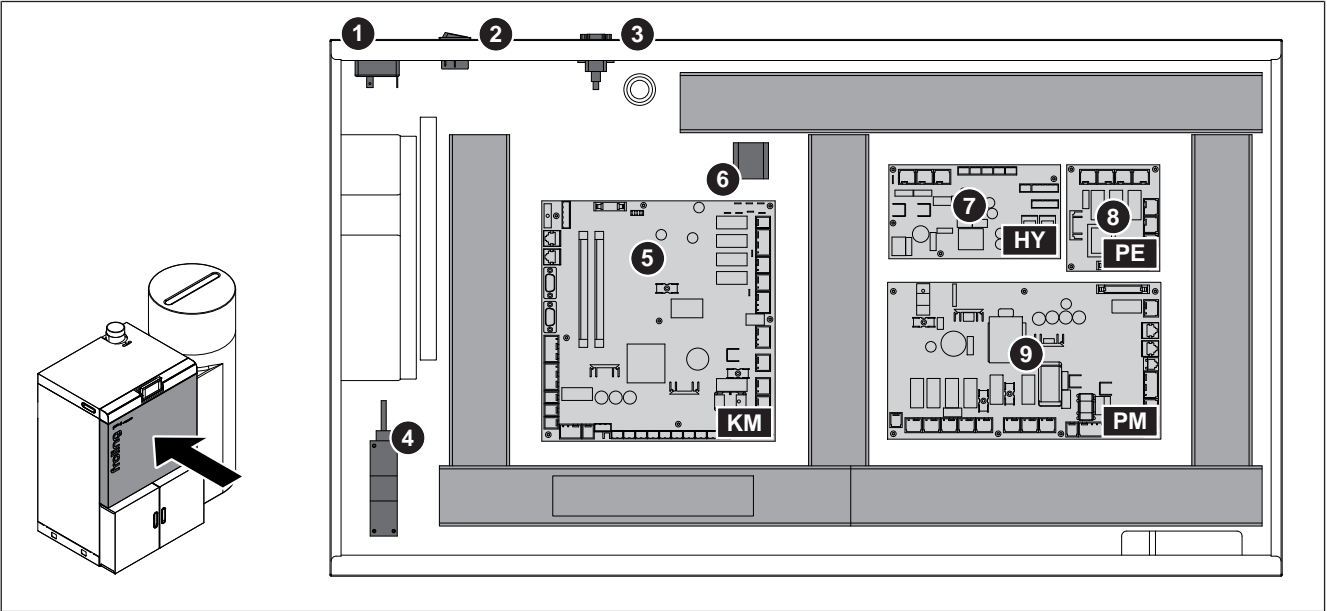
- ☐ To reassemble the controller cover and insulating cover, perform the disassembly steps in the reverse order

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



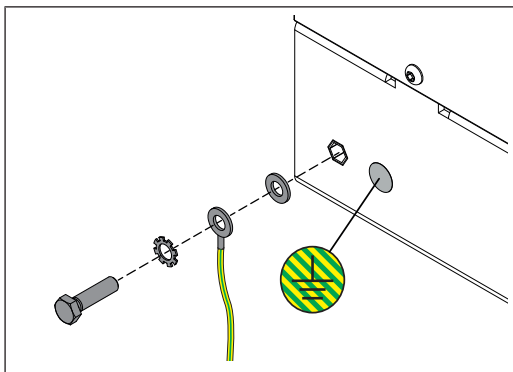
- ☐ Remove the cable ties from the tag connector
- ☐ Bind the individual cores together with cable ties (A)

6.4.1 Board overview



Item	Description	Item	Description
1	High-limit thermostat STL	6	Device connection terminal
2	Main switch	7	Hydraulic module
3	Service interface	8	Pellet module expansion (optional)
4	Mains connection plug	9	Pellet module
5	Core module		

6.4.2 Potential equalisation

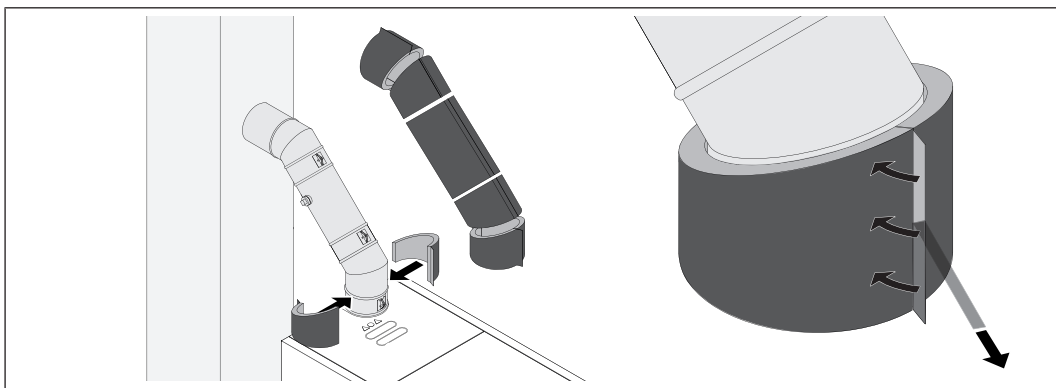


- ☐ The potential equalisation on the boiler base must comply with current directives, regulations and standards.

6.5 Final installation steps

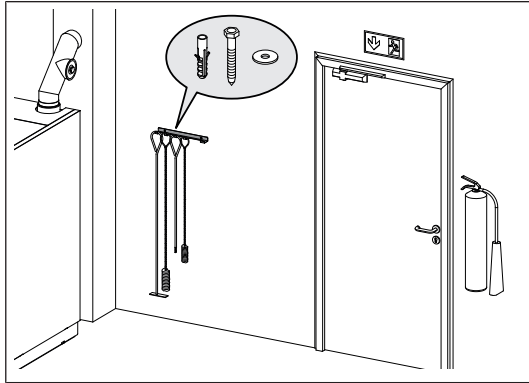
6.5.1 Insulate the connection line

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

6.5.2 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!

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 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 that all 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 all blanking plugs (e.g. drainage) for tightness
- ☐ 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.

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:	ENplus / DINplus certification scheme

General note:

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

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

7.2.2 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

7.2.3 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.

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.

Notes

[illegible]

[illegible]

Manufacturer's address

Fröling Heizkessel- und Behälterbau GesmbH

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

Zweigniederlassung Aschheim

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

Froling srl

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

Froling SARL

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

Installer's address

Stamp

Froling customer services

Austria
Germany
Worldwide

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



www.froeling.com

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