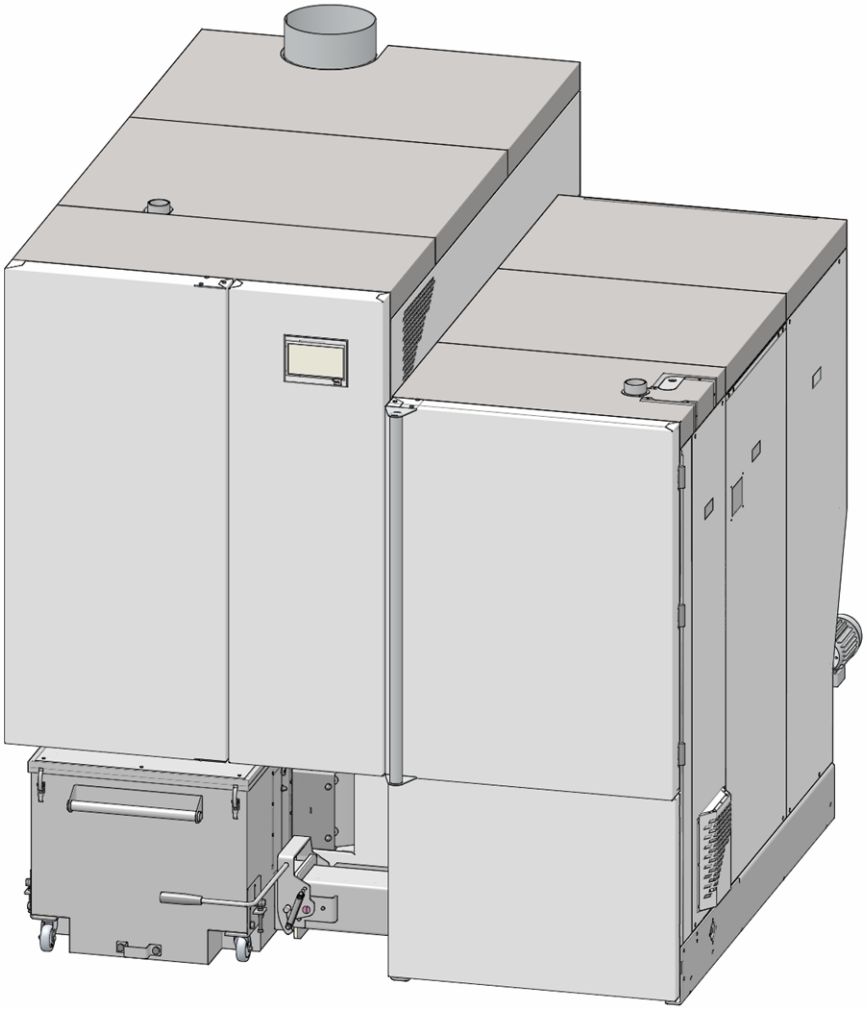

Commercial boiler **maxi**mus

Operation manual for qualified personnel

Read carefully before operating.

DR-0160-EN / v4b-201903

Content

1 About this manual

Dear heating installer

To ensure reliable and efficient operation of the heating system, the following points are extremely important:

- Correct installation
- Training of customers in commissioning
- Comply with the specifications and instructions in this manual
- Regular maintenance by the system operator
- Regular maintenance by qualified personnel

Language

The language of the original manual is German. All other language versions of this manual are translations of the original.

Storage

Keep the manual for the entire service life of the product and ready to hand. The manual must be passed on to the new owner when the product is dismantled/reused. If the manual is lost or destroyed, request a new copy from the manufacturer.

Tips and Warnings

The tips used in this manual are highlighted with symbols and signal words. The signal word indicates the level and nature of the danger and how to avert it.

Indicates information for correct handling of the product.

! **CAUTION** - Failure to comply with this instruction could result in damage to property.

⚠ **DANGER** - Failure to comply with this instruction poses a danger to people.

Explanation of symbols

- ☑ Precondition for an action
- ► Instruction
- ↳ Result of an action
- > Reference to page, figure, Chapter,...

Manufacturer

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– Service-Hotline
0043 7252 50002-4920
service@solarfocus.at

2 Safety information

Qualification of personnel

– The work procedures described in this manual must be carried out by qualified specialist personnel.
– Work on electrical components must be performed by trained electricians and in accordance with the relevant laws and directives.

Installation and commissioning

– System may only be serviced and put into operation by certified qualified personnel (SOLARFOCUS service technician or SOLARFOCUS service partner.

Keep unauthorized persons and children away

– Danger of burns due to hot lines and hot components, risk of injury from mechanically moving parts. Keep unauthorised persons away, do not leave children unattended, and control access to the boiler room and fuel storage room.

Safety devices

– Never disengage the safety equipment > 5 of the heating system. In case of failure, arrange for immediate repair.

Maintenance and repair

– Perform maintenance activities at the specified intervals. No or incorrect maintenance leads to inefficient operation, higher failure risk of the boiler and increased potential for hazards.
– Have repairs done by qualified personnel only Improper repairs can lead to risks for the user and impaired operation
– Store hot ashes only in metal containers. Never put hot or warm ash in the dustbin. There is a great danger of fire.
– For repairs use only original spare parts or parts approved by the manufacturer (e.g. standard parts).

Damage to the system

– If the electrical insulation on cables, plugs, switches becomes damaged, switch off the voltage supply and have the insulation repaired.
– In the case of visible damage (e.g. thermal deformation, mechanical damage) the operation of the system must not be continued. The system may only be operated if it is in perfect technical condition.

3 Standards, guidelines, regulations

The following bodies of regulations must be considered and adhered to during planning, installation and operation of the heating system:

– Respective state building codes
– Firing ordinance of the respective country
– Commercial and fire department rules and regulations
– *VDI 2035* - Preventing scale formation in hot water heating and hot water warming systems
– *DIN EN 12828* Heating systems in buildings - planning for water-based heating systems
– *EN 13384* - Flue gas systems - thermal and flow-based calculation methods

Austria

- *TRV B H 118* -Technical guidelines for preventive fire protection
- *ÖNORM H 5170* - Heating systems - requirements for construction and safety technology as well as for fire and environmental protection
- *ÖNORM H 5195-1* - Heat transfer media for building services systems, Part 1: Preventing damage from corrosion and scale formation in closed hot water heating systems
- *Art. 15a Agreement* - Protective measures for small solid-fuel boilers
- *Art. 15a Agreement* on energy savings

Germany

- *EnEG* - Law on energy savings, with the relevant issued decrees
- *EnEV* - Ordinance on energy-saving thermal insulation and energy-saving plant technology in buildings
- *DIN 18160* - Flue gas systems - planning and execution
- *1. BImSchV* (Federal Immission Control Ordinance - Ordinance on Small and Medium Solid-fuel Boilers

Switzerland

- *VKF/AEAI* - Fire Protection Guidelines (25-03 and 105-03)

4 Product information

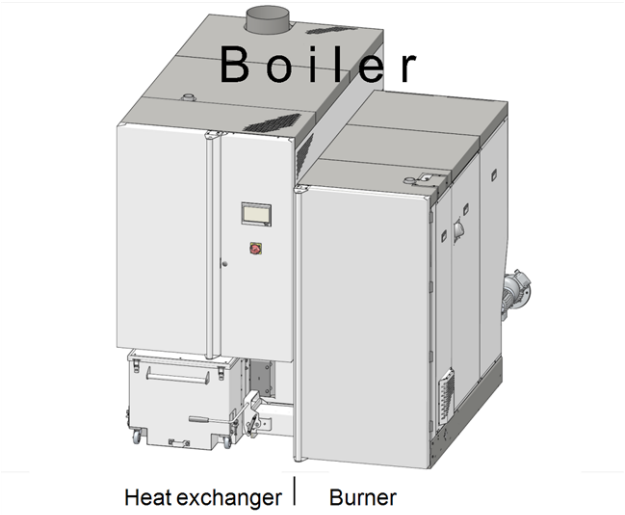


Fig. 2-1

4.1 Fuel

Pellets

Use wood pellets only in accordance with these specifications:

- Pellets according to the ISO 17225-2 standard, class A1.
- Pellets that meet the additional ENplus certification.
- Pellets that meet the additional DINplus certification.

Wood chips

Use wood chips only in accordance with these specifications:

- Wood chips according to the EN ISO 17225-4:2014 standard
- Classes A1, A1, A2, B1
- Sizes P16S and P31S
- Moisture content maximum 40%(M40)

4.2 Safety devices

Heat dissipation

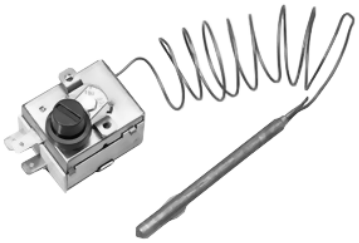
- This function of the boiler control is a safety device that prevents overheating of the boiler.
- Functioning: If the boiler temperature exceeds the set *Heat dissipation maximum boiler temperature* (in the service menu - *General Settings*), all pumps relating to the energy consumer units (e.g. heating circuit, DHW tank, buffer tank, etc.) will be switched on and the heating circuit mixer opened. In this way, energy is drained from the boiler and it may be possible to prevent other safety devices tripping.
- If the boiler temperature falls below the set *Heat dissipation maximum boiler temperature* minus 1°C again, the pumps and mixers will be operated in standard mode again.

Thermal overload protection

- The thermal overload protection prevents an uncontrolled increase in temperature and pressure of the boiler.
- Functioning: At a boiler water temperature > 95°C, the valve opens and directs cold water through the two series-connected safety heat exchangers. This lowers the temperature of the boiler and avoids the need for further safety precautions or equipment damage.

► Install thermal overload protection > 21

Overtemperature reset (OTR)



The safety temperature limiter (STL) is a safety device that prevents overheating of the boiler.

Functioning: The STL stops the heating process at a boiler temperature ~95°C (exclusively electrical function; fuel and air supply are interrupted).

After tripping, the STL must be manually released again by unscrewing the black sealing cap *1* and pressing the button as soon as the boiler temperature falls below 60°C.

If the safety overtemperature reset trips, this is indicated in the boiler control display.

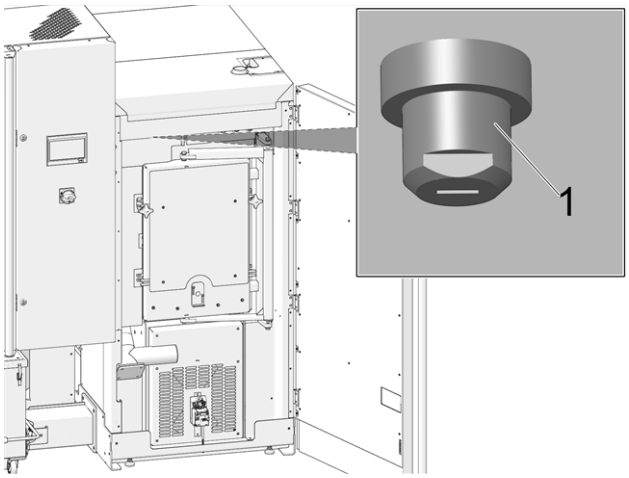


Fig. 2-2: Unscrew the closure cap

► Install overtemperature reset > 28

Safety valve (to protect against excess pressure in the system)

- The safety valve *1* is a safety device for protecting against overpressure in the water circuit of the heating system.
- Functioning: The valve opens when the system pressure exceeds 3 bar. Water/steam are discharged into an open drain via a discharge line, which avoids consequential damage to the heating system. The valve is closed during normal operation.
- For normative specification see EN 12828.

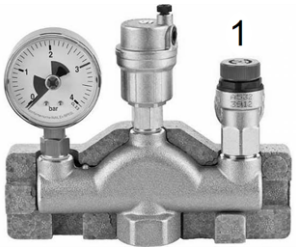


Fig. 2-3: Safety valve integrated into boiler safety group

► Install safety valve > 20

EMERGENCY OFF switch

- The EMERGENCY OFF switch is a manually operated safety device. The burner and the fuel supply to the boiler are stopped. Circulation pumps remain in operation to dissipate heat and cool the boiler.
- The switch must be installed outside the heating room in a safe place that is easy to access.

► Install EMERGENCY OFF switch > 30

Temperature monitor in the fuel storage room (TM)

- Required according to guideline TRVB 118 H for wood chips, depending on system design, heating capacity and fuel storage quantity.
- Functioning: On the channel of the fuel delivery auger, a temperature sensor of a protected design must be installed in the area of the wall penetration (inside the storage room). When a temperature of about 70°C is exceeded, the warning device is (optically or acoustically)triggered.
- Art. No.: 6565 and 6567

► Install temperature monitor > 21

Automatically triggered extinguishing device (ATED)

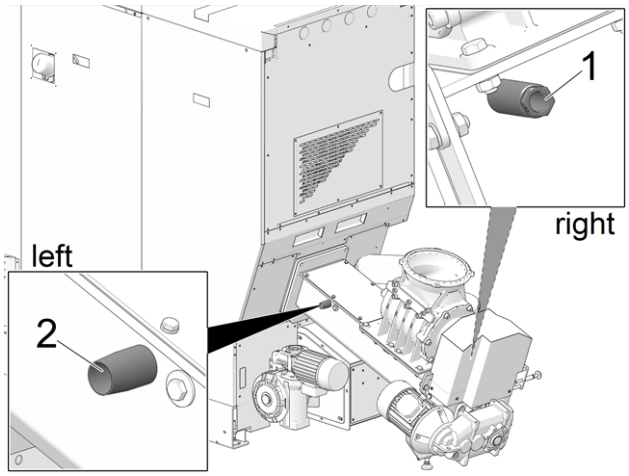


Fig. 2-4

1 Pocket sleeve for temperature sensor
2 Connection for water discharge

- Functioning: If at the temperature sensor *1* the temperature exceeds 50°C (direct extraction) or 95 °C (downpipe extraction), the valve *2* opens and floods the feeder channel with water.
- This extinguishing device serves to automatically suppress burn-back within the feeder. Due to the proper nature and location of the fire detection element, burn-back must be reliably detected and the extinguishing device must be triggered instantaneously and automatically (this must be ensured even in the event of a power failure).
- The extinguishing device must be connected either directly to a pressurised water supply or to a water reservoir (Note: Domestic waterworks may also be affected in case of power failure).
- The water supply must be equal to three times the volume of the feeder equipment, but at least 20 litres. The container must be equipped with a fill level monitor, including connection to the warning device (temperature monitor > 6). The extinguishing water inlet opening in the feeder is to be arranged and executed so that blockage by delivery operation is not possible and this can easily be checked at any time. The routing of the extinguishing system must be made as a non-combustible version.
- Art. No.: 63260 and 6553
- Specification yes/no see TRVB 118 H

Manually triggered extinguishing device (MTED)

- This extinguishing device is used to combat a fire source in the fuel storage room, or fuel storage in the area of the extraction/delivery line. The triggering must be done manually.

– This device consists of an empty pipe with a minimum nominal size of DN 20 and is to be installed in the fuel storage as specified by the manufacturer of the firing system directly above the delivery line in front of the wall or ceiling passage in such a way that the greatest possible success can be achieved in extinguishing. The empty piping must be connected directly to a pressurized water supply and provided with a shut-off valve arranged in the boiler room. Mark this valve with a sign "Extinguisher - Fuel Storage Room".
– The execution of the extinguishing system must be done so that damage during fuel feed or from the extraction device is not possible. In addition, make sure that the fuel supply to the delivery line is not affected.
– Specification yes/no see TRVB 118 H.

Rotary valve

The rotary valve installed in the standard equipment fulfils all normative requirements for the approved fuels regarding fire protection, burn-back safety, backflow of gases:

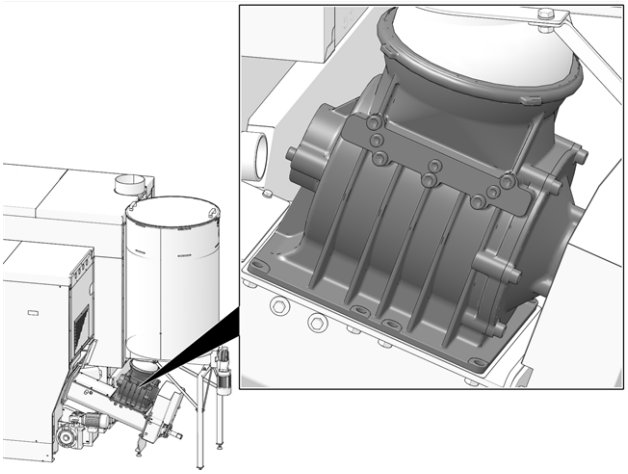
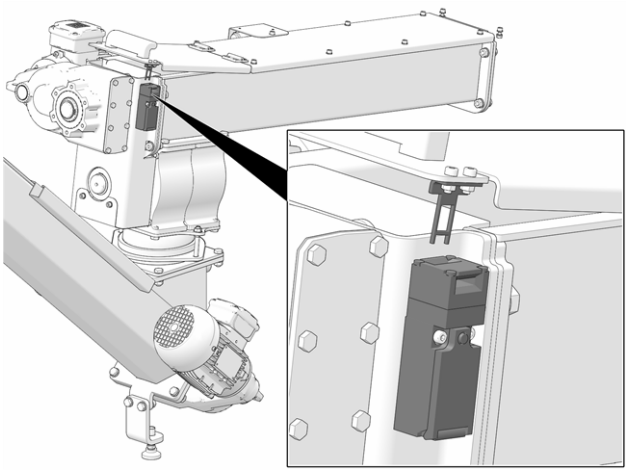


Fig. 2-5: Rotary valve

– Complies with requirements regarding burn-back protection devices (BPD) according to TRVB 118 H.
– Prevents backflow of flammable products of combustion into the fuel supply or into the intermediate store (according to EN 303-5).
– Prevents spreading of fire into the fuel supply or into the intermediate store (according to EN 303-5).

Safety switch on the channel cover



Opening the channel cover interrupts the power supply to the motor of the extraction auger.

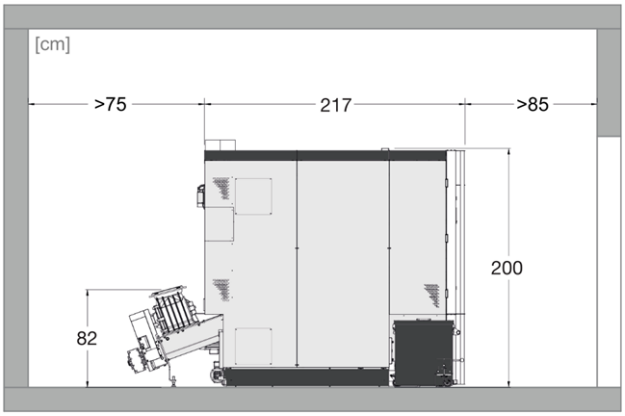
Heating system encompassing several fire compartments

If the boiler room and fuel storage room are located in different fire compartments, optional equipment must be installed in addition to the factory safety equipment, e.g.

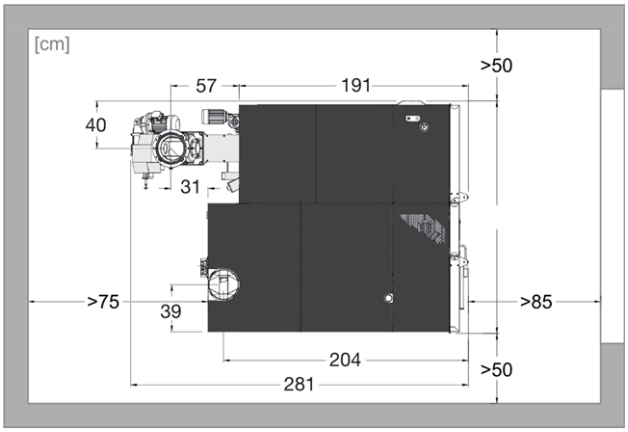
– a temperature monitor (TM) > 6
– a manually triggered extinguishing device (MED) > 6

4.3 Dimensions

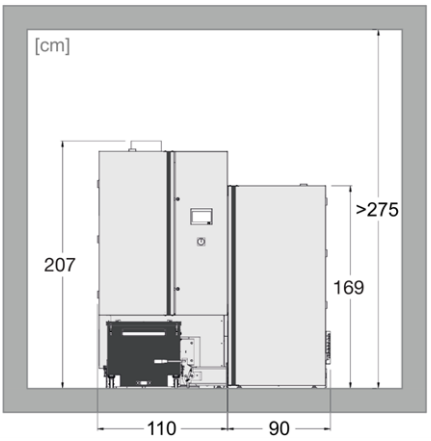
Side view



Top view



Front



4.4 Functional components, combustion principle

Burner

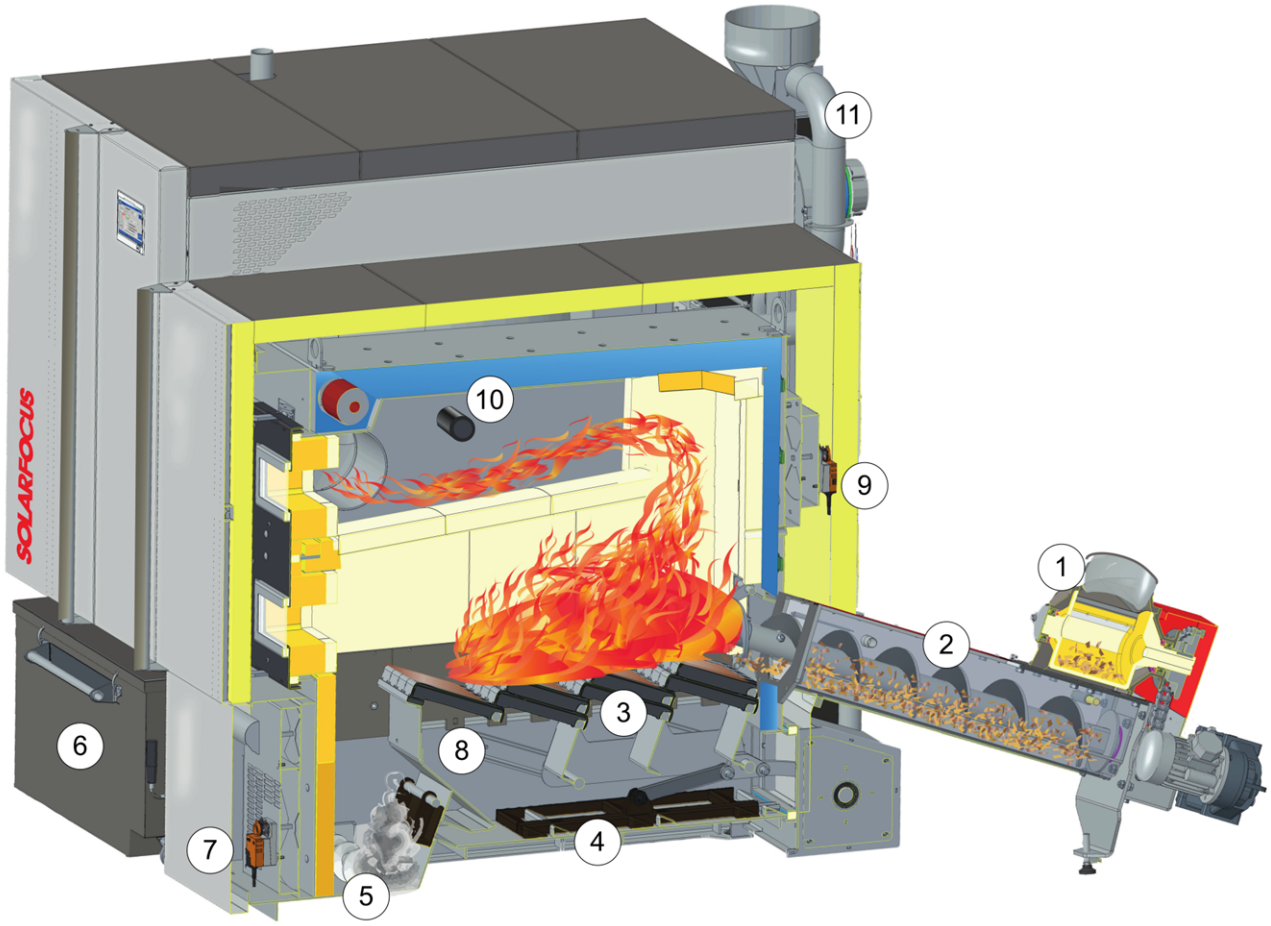


Fig. 2-6

Functional components

1	Rotary valve	5	Ash extraction burner	9	Secondary air opening
2	Feeder unit	6	Ash container	10	Combustion chamber temperature sensor
3	Push grate	7	Primary air opening	11	Flue gas recirculation line
4	Ash scraper	8	Primary air outlet		

Fuel path

- The fuel falls through the rotary valve *1* into the channel of the feeder unit *2*. The auger delivers the fuel to the feed grate *3*.
- During combustion, the fuel is transported on the feed grate, and the resulting ash falls down through the grate.
- The ash pusher *4* push the ashes to the ash auger *5*, and auger takes over the transport into the ash box *6*.

Airflow

- Primary air is sucked in at the opening *7*, forwarded in a space on the left and right side of the boiler; at the holes *8* the primary air exits under the combustion grate.
- Secondary air is sucked in at the opening *9* , and passes through holes in the fire brick (left, right, back) above the combustion grate in the combustion chamber.
- Recirculation opening *10*: If the sensor measures *11* too high a combustion chamber temperature, then air from the flue gas pipe *12* is introduced here and added to the primary air. This leads to the cooling of the combustion chamber and thus to lower stress on the components.

Heat exchanger

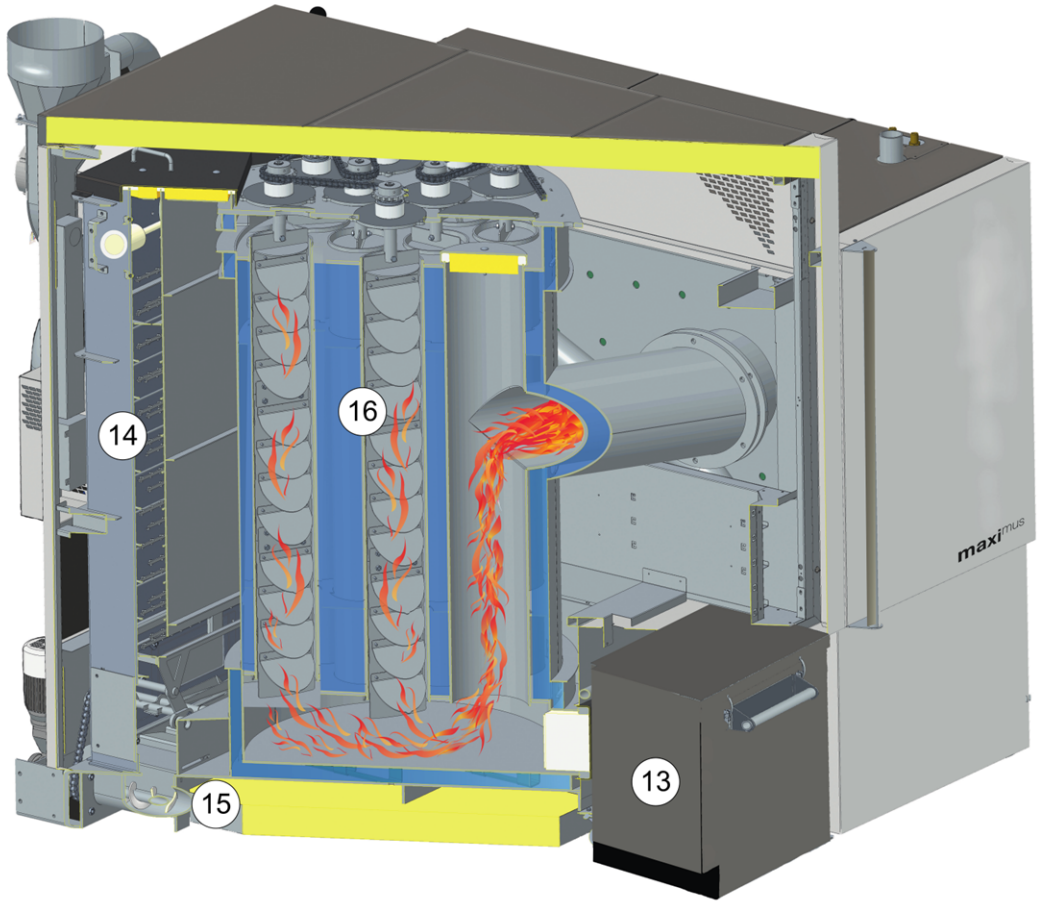


Fig. 2-7

Functional components

13	Ash container	15	Ash extraction heat exchanger
14	Electrostatic separator	16	Heat exchanger

Ash path

- The ashes falling on the feed grate are transported from the transverse ash auger into the ash container *13*.
- The ashes falling on electrostatic separator *14* are transported forward by the auger *15* into the ash container.

Airflow

- The flue gas from the combustion chamber flows past the heat exchanger *16*, on the electrostatic separator into the flue gas pipe and into the chimney.

4.5 Technical specifications

maximus		**150**	**200**	**250**	**300**
Wood chips output	[kW]	149	201	240	-
Pellets output	[kW]	149	201	250	299
Boiler class (acc. to EN 305:5 2012)		5	5	5	5
Dimensions					
Width	[cm]	189	189	189	189
Height incl. adjustable feet [1]	[cm]	207	207	207	207
Depth with ID fan	[cm]	222	222	222	222
Burner insertion dimension (width)	[cm]	90	90	90	90
Heat exchanger insertion dimension (width)	[cm]	110	110	110	110
Minimum room height [2]	[cm]	275	275	275	275
Weight					
Burner weight	[kg]	700	700	700	700
Hat exchanger weight	[kg]	950	950	950	950
Total weight	[kg]	1650	1650	1650	1650
Water side					
Water content	[l]	565	565	565	565
operating temp.	[°C]	70 - 90	70 - 90	70 - 90	70 - 90
Maximum permissible temperature	[°C]	90	90	90	90
Max. permissible operating pressure	[bar]	3	3	3	3
Min. return flow temperature	[°C]	60	60	60	60
Connection Boiler inflow/Boiler return flow	[“]	G 2“ OT	G 2“ OT	G 2“ OT	G 2“ OT
Drain connection	[“]	1”	1”	1”	1”
Connection for thermal overload protection	[“]	G 1/2“ OT	G 1/2“ OT	G 1/2“ OT	G 1/2“ OT
Electrical systems					
Electrical connection		400 V AC, 50 Hz, 16 A, 3P+N+PE	400 V AC, 50 Hz, 16 A, 3P+N+PE	400 V AC, 50 Hz, 16 A, 3P+N+PE	400 V AC, 50 Hz, 16 A, 3P+N+PE
Fuel					
Fuel - wood chips		Wood chips in accordance with EN ISO 17225-4, classes A1, A2, B1, B2; sizes P16S and P31S; water content max. 40% (M40) > 4			
Fuel - wood pellets		Wood pellets according to EN ISO 17225-2 > 4			
Flue gas side					
Flue gas pipe diameter	[cm]	25	25	25	25
Height of flue gas pipe [1]	[cm]	207	207	207	207
Minimum draught requirement [3]	[Pa]	5	5	5	5
Maximum flue gas temperature [4] full load	[°C]	140	140	140	140

maximus		**150**	**200**	**250**	**300**
Emissions according to test report: *Wood chips*					
Flue gas value [5] from test report: Test institute / test report no.		18-IN-AT-UW-OÖ-EX-205/3 TÜV Austria	Interpolation according to EN 303-5	18-IN-AT-UW-OÖ-EX-205/4 TÜV Austria	-
CO full load	[mg/m³]	19	30	38	-
CO Partial load	[mg/m³]	20	20	20	-
NO_X full load	[mg/m³]	120	120	115	-
NO_X partial load	[mg/m³]	93	93	93	-
Org. C full load	[mg/m³]	2	2	2	-
Org. C partial load	[mg/m³]	2	2	2	-
Dust content full load	[mg/m³]	9.5	11.6	13.8	-
Dust content partial load	[mg/m³]	6.5	6.5	6.5	-
Flue gas mass flow full load	[g/s]	97.9	130.5	156.7	-
Flue gas mass flow partial load	[g/s]	29.4	39.2	47.0	-
Emissions according to test report: *Pellets*					
Flue gas value [5] from test report: Test institute / test report no.		18-IN-AT-UW-OÖ-EX-205/1 TÜV Austria	Interpolation according to EN 303-5	Interpolation according to EN 303-5	18-IN-AT-UW-OÖ-EX-205/2 TÜV Austria
CO full load	[mg/m³]	<3	3	3.6	3.6
CO Partial load	[mg/m³]	29	29	29	29
NO_X full load	[mg/m³]	112	112	113	113
NO_X partial load	[mg/m³]	83	83	83	83
Org. C full load	[mg/m³]	2	2	2	2
Org. C partial load	[mg/m³]	2	2	2	2
Dust content full load	[mg/m³]	6.5	8	8.7	10.2
Dust content partial load	[mg/m³]	5	5	5	5
Flue gas mass flow full load	[g/s]	94.5	126.0	157.6	189.1
Flue gas mass flow partial load	[g/s]	28.4	37.8	47.3	56.7

[1] Adjustable feet at maximum depth of thread
[2] The minimum room height is required for maintenance work
[3] A draught stabiliser must be fitted if the specified draught of 15 Pa is exceeded
[4] Flue gas temperature can be adjusted electronically.
[5] Flue gas values in mg/m^3 are based on 13% O_2 of the volume flow

5 Prior to assembly

Consult a competent chimney sweep before connecting the heating system. He must approve the installation and is the contact person regarding technical and legal issues.

5.1 Transport

Option 1: Transport with a lift truck

In both parts (burner and heat exchanger), the webs *3* are used on the bottom as a support for the truck.

- ► Approach the burner *1* from the back
- ► Approach the heat exchanger *2* from the front.

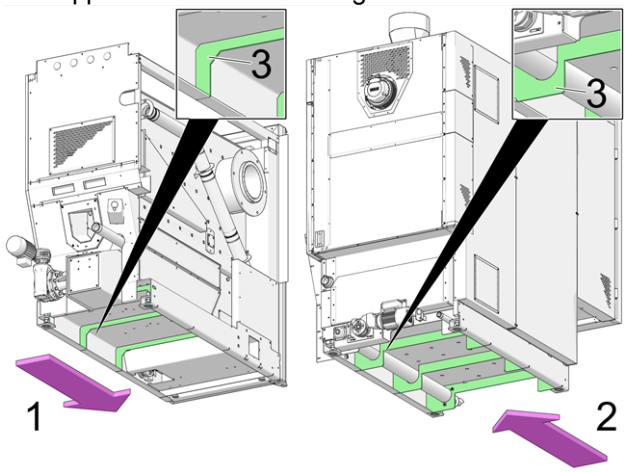


Fig. 2-8: Transport boiler with truck

Option 2: Lifting with a crane

WARNING - When using a hoist (e.g. chain), make sure that the angle does not fall below 45 degrees. If it falls below this, excessively high forces act on the components and damage is possible.

- ► Secure the heat exchanger at four metal eyelets *1*.
- ► Secure the burner at both metal eyelets *1*.

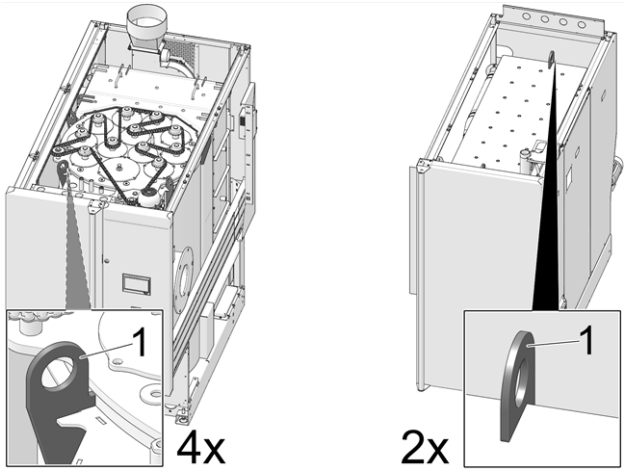


Fig. 2-9: Metal eyelets for crane transport

5.2 Boiler room

Structural specifications

- The boiler may only be installed in a dry, frost-free room; the permissible room temperature is 5 to 30°C.
- The boiler may only be used on a sufficiently stable and non-combustible surface.
- Observe spacing to flammable materials (regional regulations).
- Note the installation dimensions to ensure sufficient space is provided (e.g. for service and maintenance work).
- For normative specifications see Austrian standard ÖNORM H 5170

Fire extinguishers

- Austria: A 6 kg ABC powder extinguisher is specified as the minimum requirement. Install it outside the boiler room in an easily visible and quickly accessible place.
- Germany, Switzerland: In private homes, no fire extinguisher is required for heating systems. However, having a fire extinguisher is recommended.

Keep escape routes clear

- Under staircases, on escape routes and in unfinished attics, the installation of fireplaces is inadmissible.

Supply air/exhaust air in Boiler room

For Austria (according to standard H 5170):

- For the supply air, 2 cm² per kW thermal output of the fuel, but allow at least 200 cm² free cross-section. (Fuel heat capacity = boiler capacity / efficiency)
- For the exhaust air, allow at least 180 cm² free cross-section up to 100 kW nominal heat and an additional 1 cm² free cross-section for every further kW.

Calculate at least a further 20 % for wire mesh in the aeration cross-section.

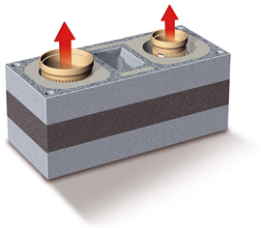
For Germany In accordance with the Model Firing Ordinance:

- For heating appliances with a nominal output of up to 35 kW, a combustion air opening of at least 150 cm² or 2 x 75 cm² routed directly into the open air must be provided.
- Alternatively, a door/window leading outside and a room content of at least 4 m³/kW nominal heat output are suitable. If the Boiler room does not abut onto an outside wall, combustion air supply via connecting rooms is possible. Here, the combustion air is supplied via a sufficiently dimensioned adjacent room which abuts onto an outside wall.
- From 35 to 50 kW, provide a free aeration cross-section of at least 150 cm². From 50 kW upwards, for aeration and ventilation, provide a minimum free cross-section of 150 cm² for each, plus 2 cm² per KW in excess of 50 kW.

Calculate at least a further 20 % for wire mesh in the aeration cross-section.

Boiler power [In kW]	Minimum space [in cm²] including 20% surcharge for grids			
	Austria		**Germany**	**Switzerland**
	Supply air	Exhaust air	Supply air/Exhaust air	Supply air
20 kW	>240	>216	>180	>206
25 kW			>180	>258
35 kW			>180	>361
50 kW			>228	>515
70 kW			>228	>721
90 kW			>276	>927
130 kW	>347	>252	>372	>1339
200 kW	>533	>336	>540	>2060
400 kW	>1067	>576	>1020	>4120

5.3 Chimney, flue gas pipe



Chimney cross-section and chimney height

The necessary cross-section depends on the nominal output of the heating system and the effective chimney height (at least 6.5 m). We recommend that you have the calculations performed by an expert.

Chimney execution

- The chimney must be resistant to moisture. Use fire brick or stainless steel.
- The chimney must conduct away the flue gases reliably at all times.

Connect the chimney condensate drain to the sewage system

- Connect the condensate drain line of the chimney to the domestic sewage system (to drain condensate, rainwater).
- Use DN 25 diameter pipe, install siphon.

Provide each boiler with its own chimney

- The boiler and the fireplace must be coordinated. This is the only way to ensure the proper functioning of the heating system and the correct discharge of the flue gases.
- If there is only one chimney available for two boilers, there is a risk (considering the different operating states of the boilers - full load/partial load). This can lead to problems (e.g. the flue gas has too low energy during the ascent, and does not lift off sufficiently from the chimney mouth, ...odour pollution by flue gases).
- Singly equipped chimneys are more reliable and safer than multi-fuelled fireplaces.

Do not connect a gas boiler and blower boiler to the same chimney

Do not connect a wood-burning stove and blower boiler to the same chimney

- A wood-burning stove typically requires a larger chimney diameter than the blower boiler.
- Acoustic disturbance from the blower boiler may be possible in the living room (by the wood-burning stove).
- Unnecessary risk due to gas leakage, e.g. if the blower boiler is defective.

Execution of the flue gas pipe

- **Run the flue gas pipe towards the chimney in a short and rising direction, with as few changes of direction as possible.**
- Change direction in the form of aerodynamically favourable arcs, do not build kinks.
- The diameter of the flue gas pipe to the chimney may be enlarged if required, but may not be reduced.
- Place the inlet of the flue gas pipe in the chimney just below the ceiling.
- The flue gas pipe must be tight. Seal seal-less flue gas pipes on site with heat-resistant silicone.

Insulate flue gas pipe

- Insulate the flue gas pipe continuously from the boiler to the chimney.
- Recommended insulation thickness: 50 mm rockwool.
- Serves to prevent temperature loss and prevents the consequential formation of condensation.

Cleaning opening in the flue gas pipe

- To clean the flue gas pipe (e.g. removal of accumulated fly ash) there must be an easily accessible cleaning opening.
- Recommendation: Coordinate the number and placement of the cleaning openings with the chimney sweep.

Opening for emissions measurement in the flue gas pipe

Make an opening (hole) in the flue gas pipe to perform the prescribed emission measurement > 22

Minimum draught requirement for boiler: 5 Pa

A draught stabiliser must be fitted if the specified draught of 15 Pa is exceeded.

► Establish the chimney connection > 22

Recommended chimney diameter

For all **maxi**[mus] Boilers (150 to 300 kW output), a chimney diameter of 25 cm is recommended.

Install explosion damper

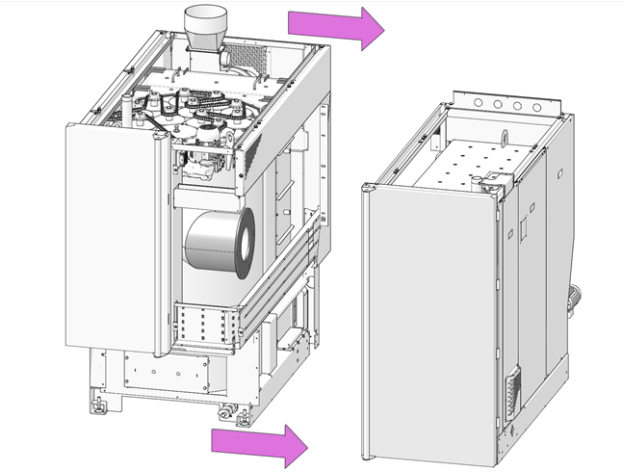
Fig. 2-10: Explosion damper integrated into draught limiter

Before longer horizontal pipe sections (L>20xD) and at the high point before dropping down the flue gas pipe, an explosion damper must be installed, independent of the boiler output.

From 100 kW boiler output, an explosion damper is required in the flue gas pipe. This avoids damage to the boiler or the flue gas system even when deflagrations occur.

6 Installation

6.1 Mount heat exchanger on the burner



This chapter describes how to make the necessary connections between the heat exchanger and the burner.

! **WARNING** - Before connecting the burner and heat exchanger, check that the sealing cord *1* in the flue gas pipe flange is in the correct position.

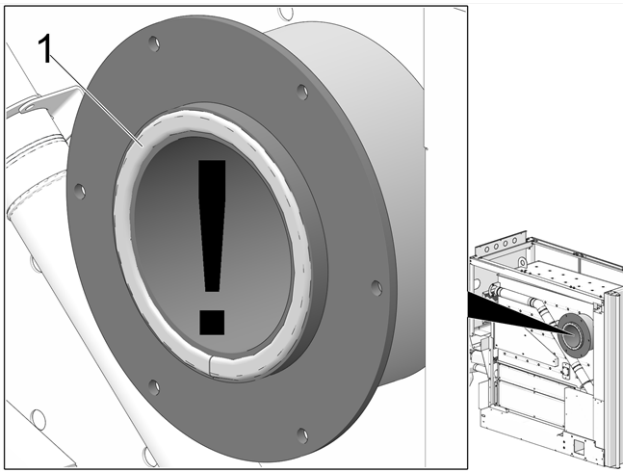


Fig. 2-11: Sealing cord in the flue gas pipe of the burner

6.1.1 Adjust spacing screws

► The two lower holes *1* serve to receive the spacing adjustment screws.

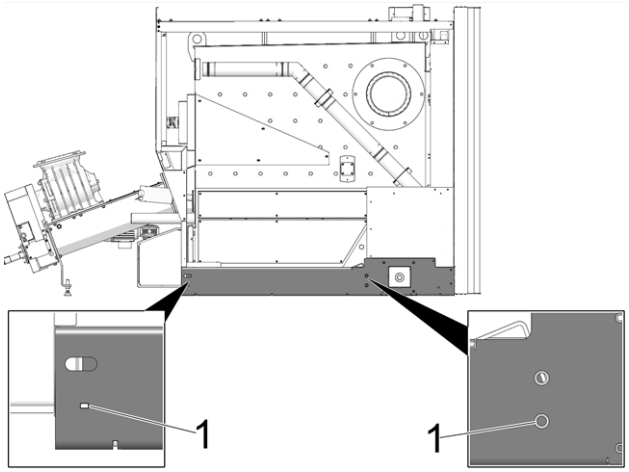


Fig. 2-12: Hole for screws

► Set the two hexagonal screws so that a spacing of **25 mm** is maintained between the bottom plates of the burner and the heat exchanger.

► Push the heat exchanger to the burner (spacing screws) until the stop.

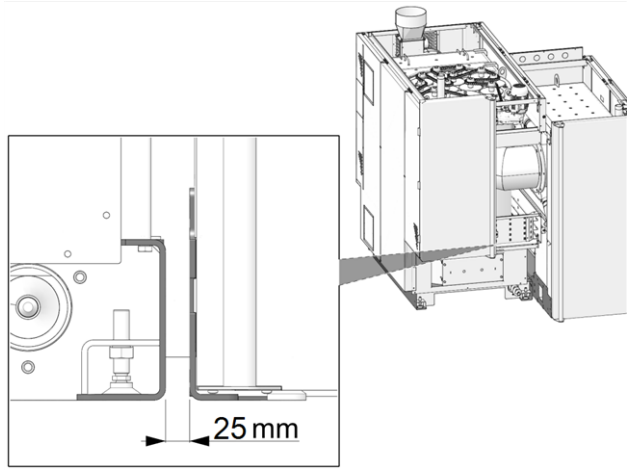


Fig. 2-13: Distance between the bottom plates

6.1.2 Screw on flue gas pipe flange

► Connect the flange of the flue gas pipe with 6 pcs. hexagonal screws and nuts.

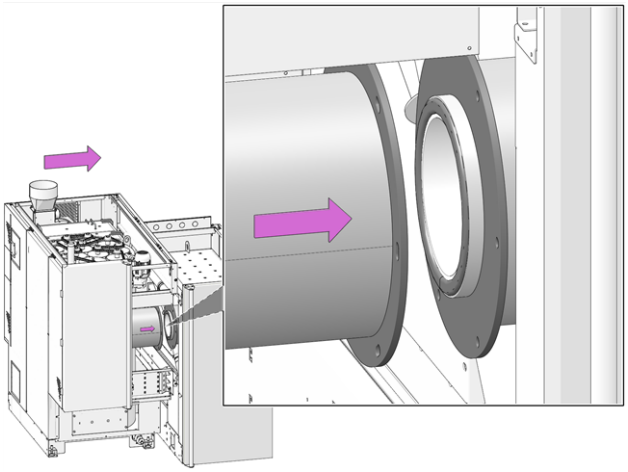


Fig. 2-14: Screw on flue gas pipe flange

6.1.3 Install automatic ash extraction

Check the correct position of the ash auger heat exchangers: The auger must be locked in the rear drive in the bayonet mount.

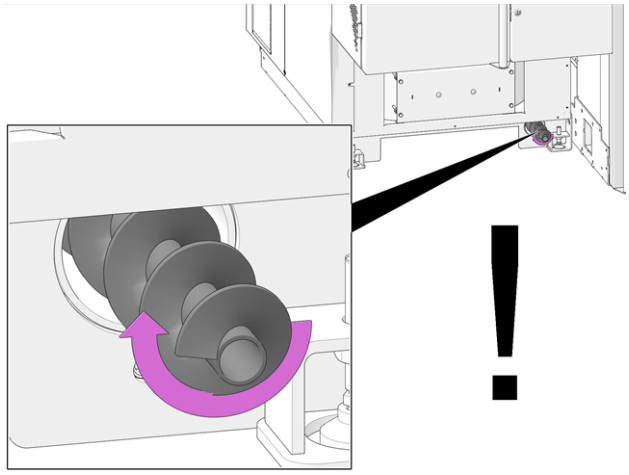


Fig. 2-15: Check auger drive

► Mount Auger channel *1* on the heat exchanger.

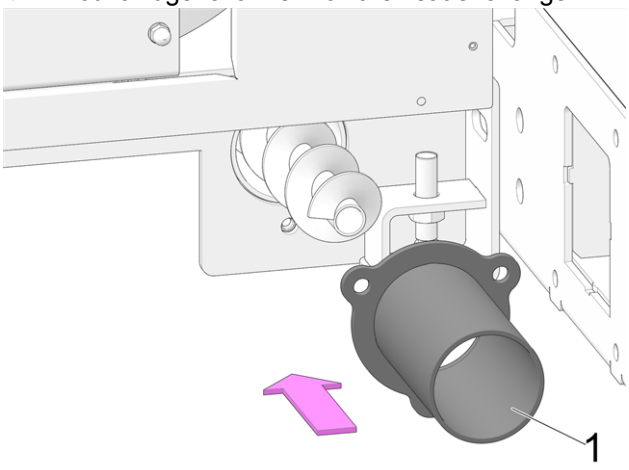


Fig. 2-16: Mount the auger channel

► Slide metal rings *1* and *2*, and gasket *3* onto the auger channel.

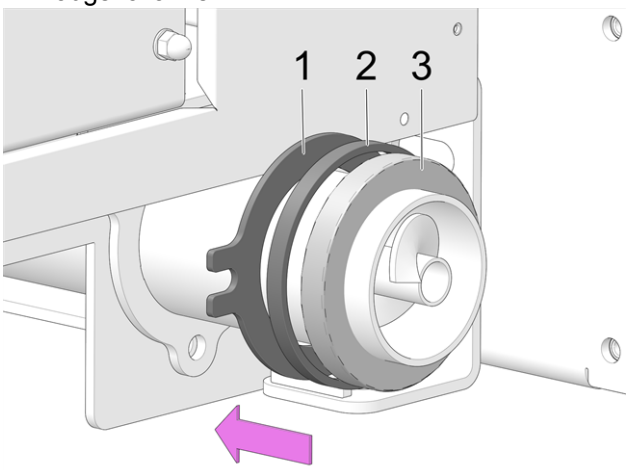


Fig. 2-17: Slide on sealing elements

► Screw flange plate onto the screw channel.

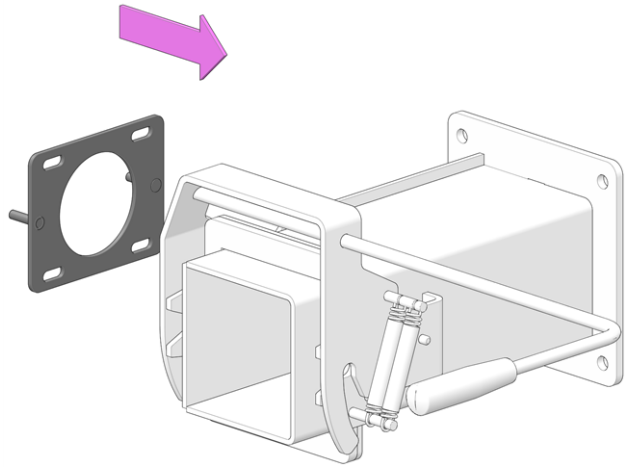


Fig. 2-18: Mount flange plate

► Mount the auger channel onto the burner with 4 pcs. hexagonal screws.

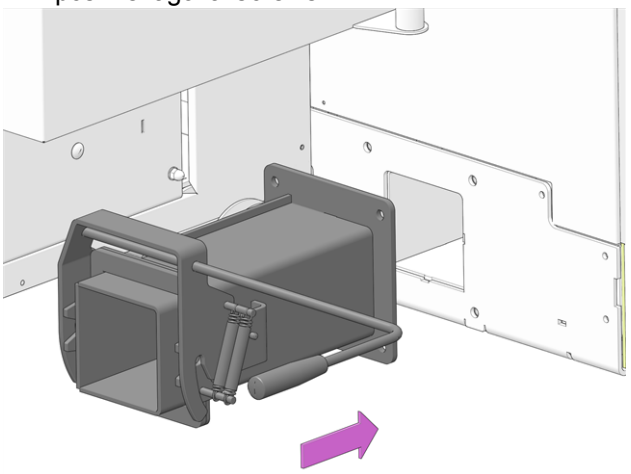


Fig. 2-19: Mount the auger channel

► Tighten metal rings with 2 pcs. hex nuts onto the threaded bolts; the (white) sealing ring is pressed axially, creating a radial seal.

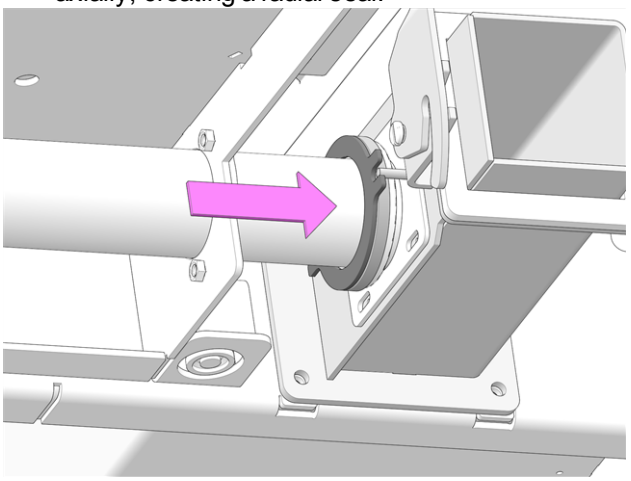


Fig. 2-20: Tighten sealing elements

► Slide the ash extraction auger *1* into the auger channel.

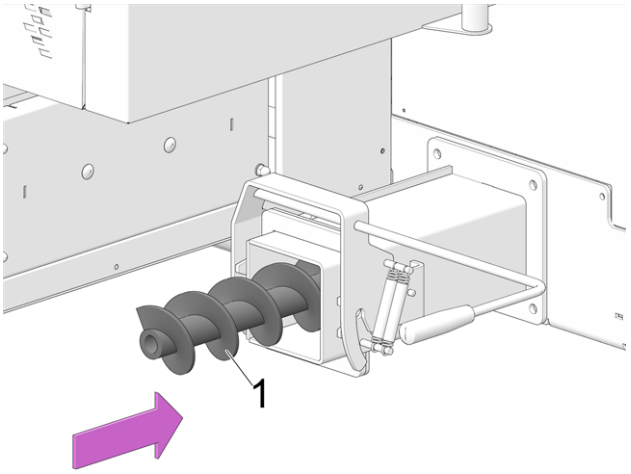


Fig. 2-21: Insert the auger

► Dismantle cover *1*
► Fix auger shaft *2* into the receptacle *4* with hexagonal screw *3* and hex nut.

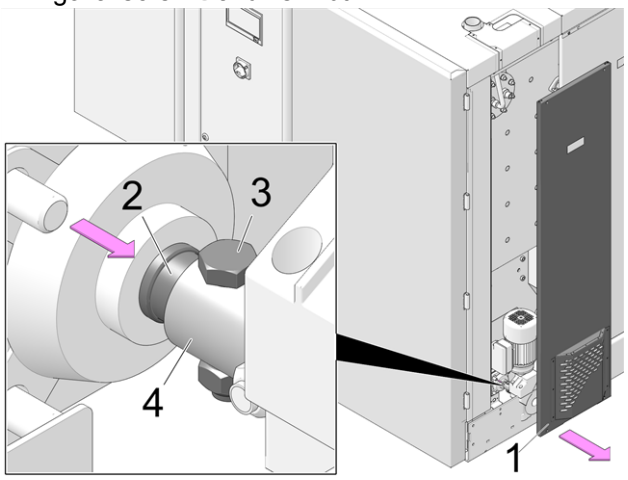


Fig. 2-22: Connect the auger shaft

6.1.4 Connect flue gas recirculation line

► On the back, connect the flue gas recirculation line from the burner *1* to the ID fan *2*.

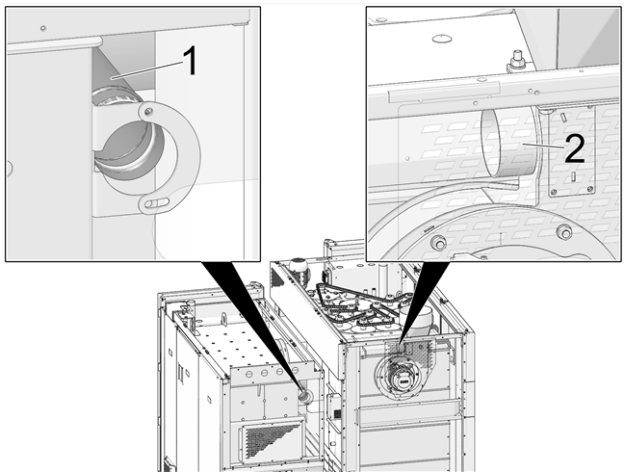


Fig. 2-23

6.1.5 Connect burner and heat exchanger hydraulically

► Make piping between the two connections. (Connection is not pre-fabricated).

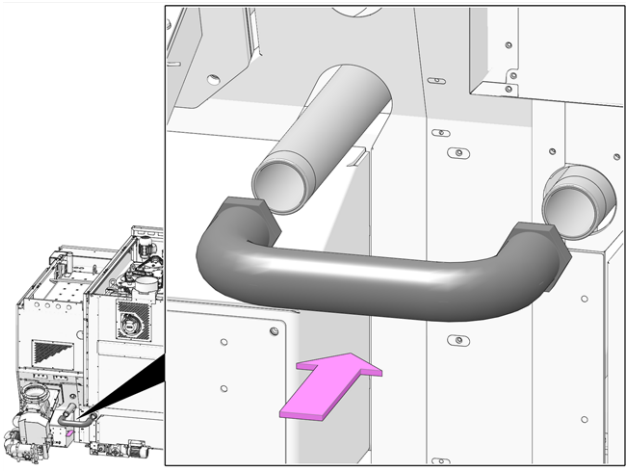


Fig. 2-24: Connect the water circuit

6.2 Install the hot air fan

► Install hot air fan *1* in the ignition tube.
► Connecting to terminals:
Fan **A1:X7**
Heating element **A1:X4**
► The cable is pre-routed in ducts 3 and 2 > 31.

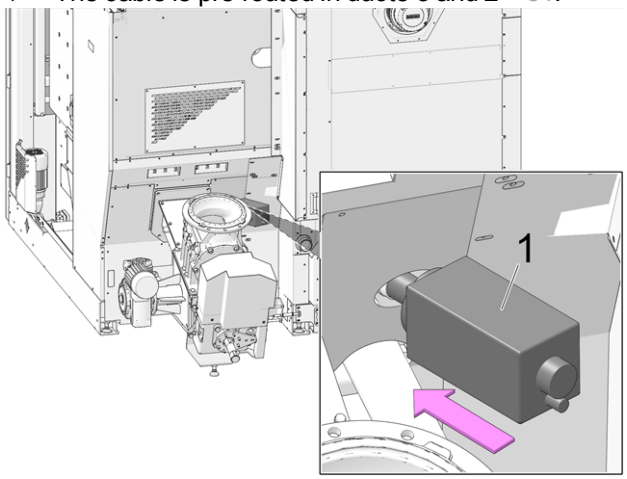


Fig. 2-25: Install the hot air fan

6.3 Mount feeder grate drive

► Mount drive unit *1* (plate, housing, motor/gearbox) to the burner with 4 pcs hexagonal screws.
► Mount connecting rod *2* with washer and circlip on the bolt *3*.
► If necessary (to turn the crank), remove motor/-gearbox *4*.
► Connect motor to **X4.7-X4.9**; the cable is pre-routed in ducts 3 and 2 > 31.

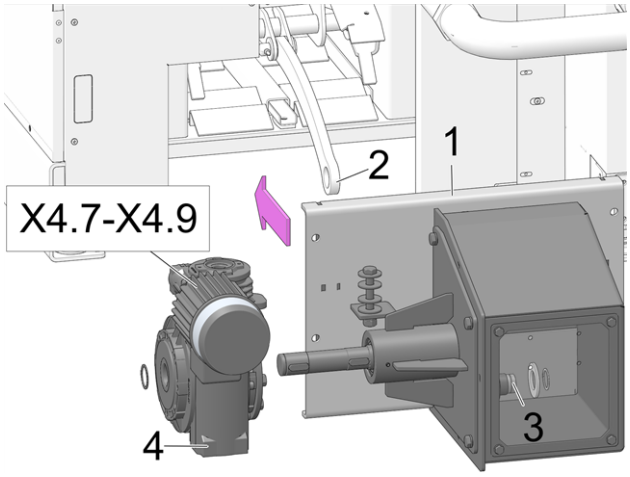


Fig. 2-26: Mount feeder grate drive

Connect the feed grate motor

► Connect the pre-routed cable as shown in the terminal area of the motor.

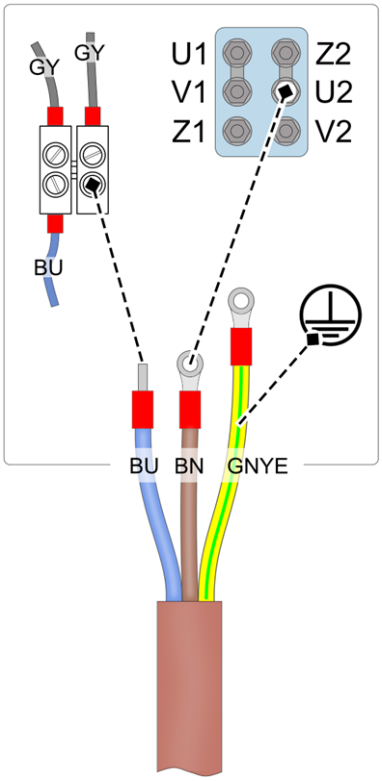


Fig. 2-27: Connect the cable in the motor terminal area

6.4 Install the feeder unit

► Mount the feeder unit *1* including installed rotary valve, to the burner with 4 pcs. hexagonal screw; enclose seal *2*.
► Set adjustable foot *3*.
► Connect the feeder motor *4* to the cable **FU1** pre-routed in ducts 3 and 2 > 31**: U,V,W**.

Check - swap two phases if the direction of rotation is wrong.

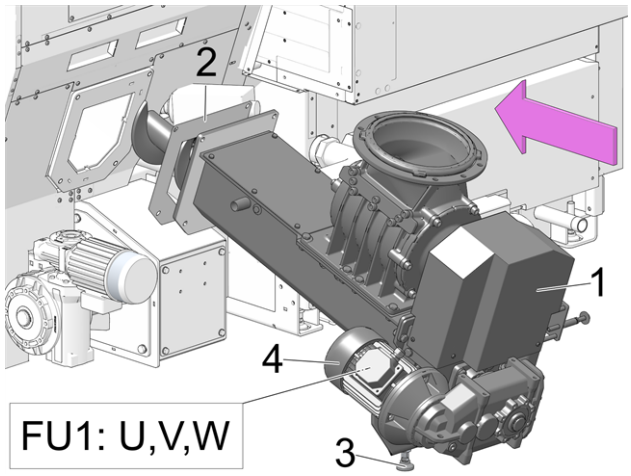


Fig. 2-28: Install the feeder unit

Install the feeder sensor

► Fix the feeder sensor *1* in the retaining tube
► Connect to **A1:X33**, cable is pre-routed in ducts 3 and 2 > 31.

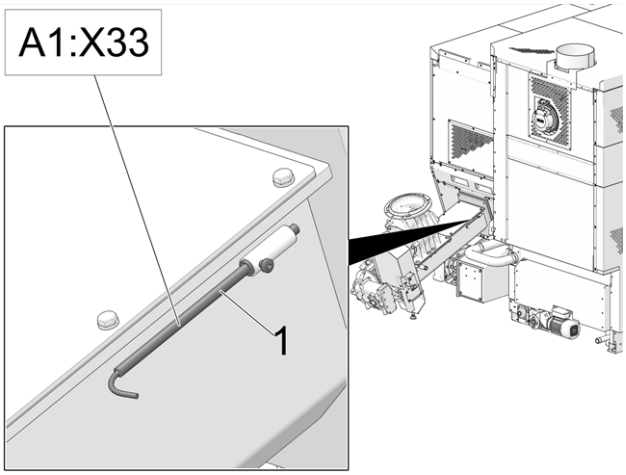


Fig. 2-29: Install the feeder sensor

Connect the feeder motor

► Connect the pre-routed cable as shown in the terminal area of the motor.

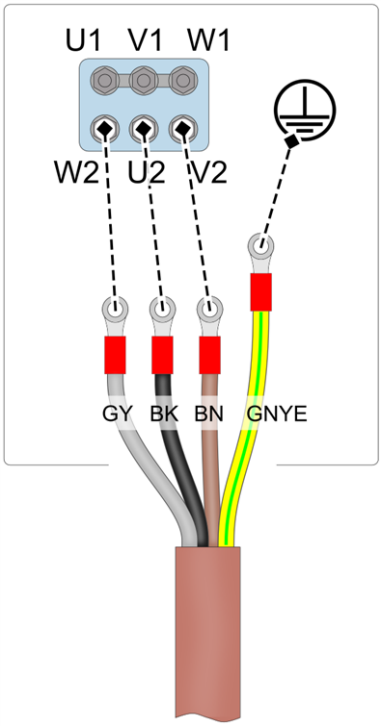


Fig. 2-30: Connect the cable in the motor terminal area

6.5 Install safety valve

► Install the safety valve in the boiler supply line, at the highest point of the line, as close as possible to the boiler. Observe installation position.

! **CAUTION** - Do not install any barriers in the pipework that could render the boiler safety group ineffective.

6.6 Install return booster

Information on return booster > 24

6.7 Install thermal overload protection

CAUTION

- Only standard-tested thermal overload protection may be installed (according to the EN 14597 standard).
- The cold water pipe must not be able to be shut off and must permanently have a minimum pressure of 2 bar; the water temperature must not exceed 15°C. A flow of 2 m³/h must be guaranteed.
- The drain line must be routed freely into an open drain funnel.
- A backflow inhibitor and, as a pressure limiting device, a safety valve or an expansion tank with a minimum capacity of 4 litres must be installed at the inlet connection.

The boiler **maxi**mus has two safety heat exchangers installed (one in the burner, one in the heat exchanger). The two safety heat exchangers are connected in series. Only the connection to the burner has to be made on site.

► Connect the thermal drain safety device as shown, i.e. inflow line *1*, backflow line *2*.

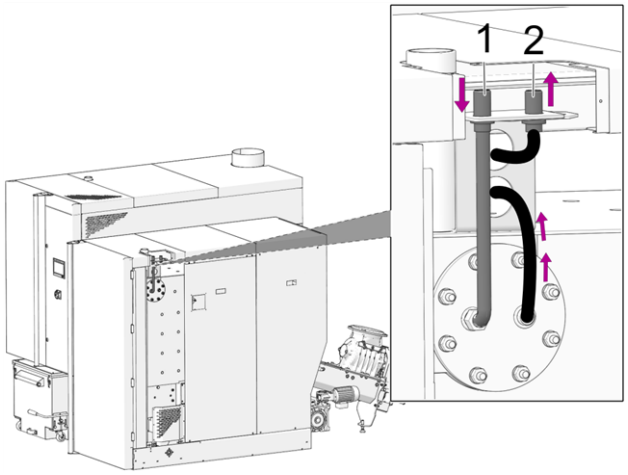


Fig. 2-31: Connect thermal overload protection

► Fit the thermal overload protection in the direction of flow as seen before the safety heat exchanger (i.e. no water pressure building up in the heat exchanger).

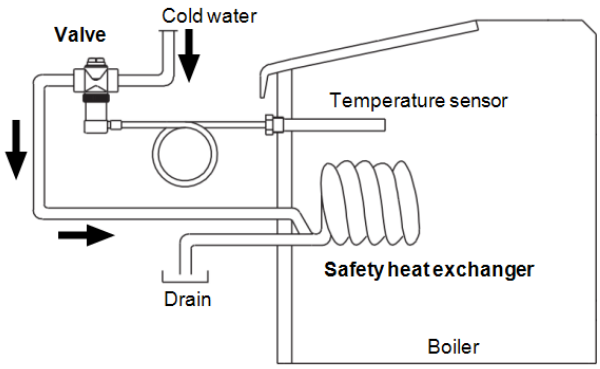


Fig. 2-32: Function of the thermal overload protection (schematic representation)

Safety heat exchanger in the heat exchanger

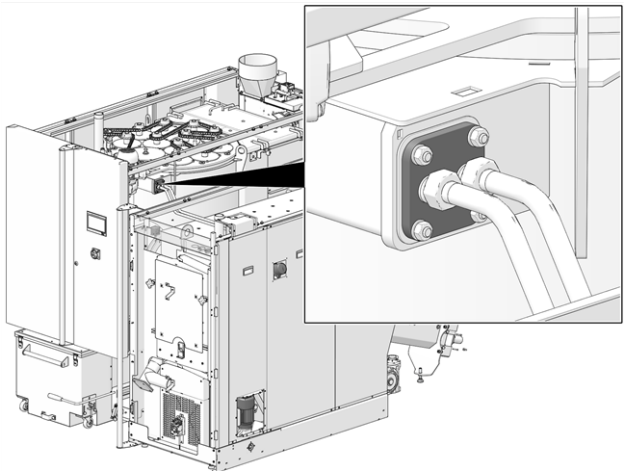
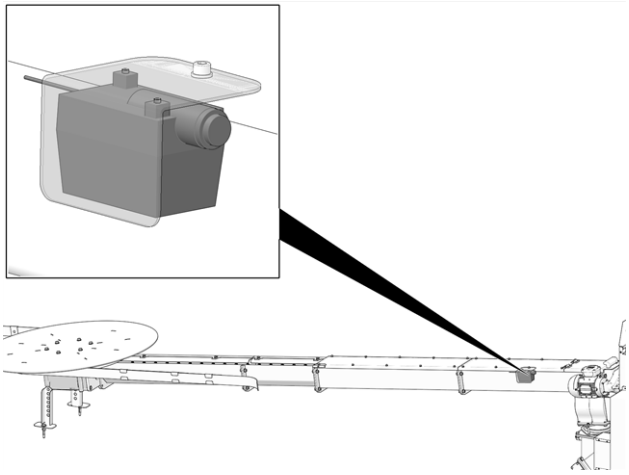


Fig. 2-33

6.8 Install temperature monitor (TM)



► Mount the temperature monitor on the channel of the fuel auger in the area of the wall penetration (inside the storage room).
► Connection to terminal X7.1 - 7.2

6.9 Fill the heating system

The filling can be done via the drain connection > 25 of the boiler. This is placed on the back of the heat exchanger.

6.10 Bleed the heating system

Boilers of the series **maxi**^{mus} have no vent valves installed in the boiler. The venting takes place via the piping system (e.g. vent valve in the boiler safety group). Set venting option at the highest point of the entire system in the flow.

6.11 Establish the chimney connection

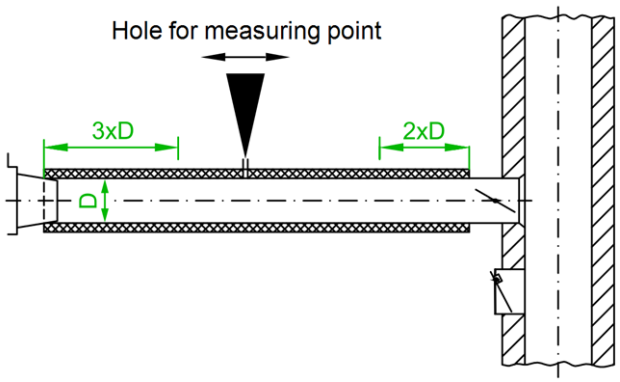
See instructions for execution > 14

6.11.1 Flue gas pipe: Hole for emission measurement

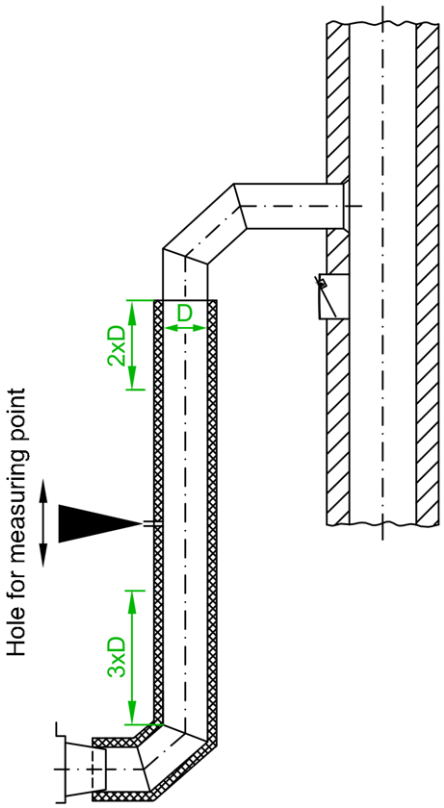
- ► Make the hole for the emission measurement according to the following images (recommendation according to standard).
- ► If these specifications cannot be implemented, then make the measuring point after a calming section, i.e. after the longest straight section of the pipe. The tube orientation (horizontal, vertical, oblique) plays no role in this case.
- ► In any case, place the measuring point before any existing draught limiters.

You can find the function for carrying out the emission measurement in the boiler operation manual, keyword: *Chimney sweep function.*

Exhaust pipe horizontal



Exhaust pipe vertical



6.12 Mount ash container

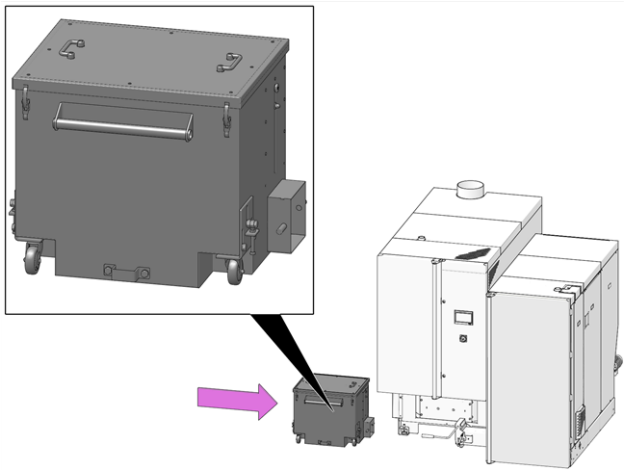


Fig. 2-34: Mount ash container

Latch in ash container

► Press lever *1* down to the stop. The ash container is thereby pressed against the auger channel.

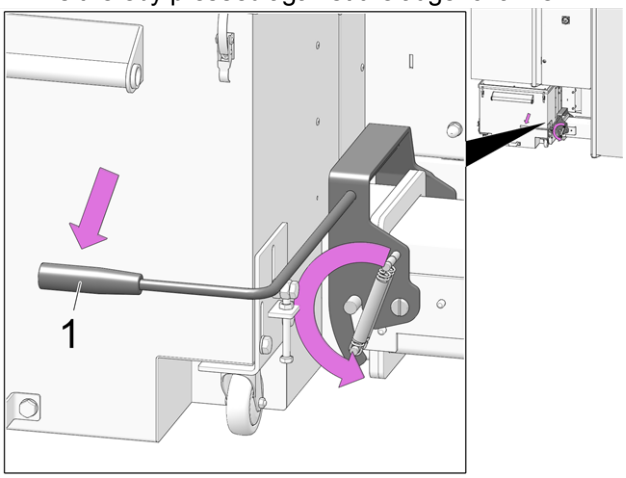
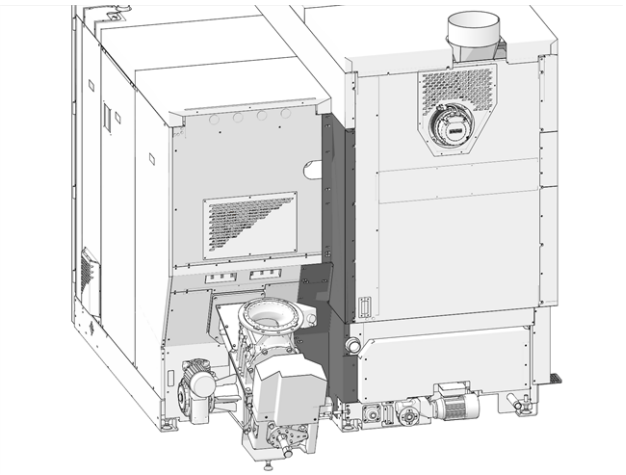


Fig. 2-35: Latch in ash container

6.13 Mount cladding on the boiler

► Mount two covers on the back.



7 Hydraulic connection

7.1 General information

Provide sufficient shut-off options

Position shut-off valves for each section (in buffer tank, etc.) in order to minimise the quantity of water that needs to be replaced in the event of repairs or system extensions

Expansion tank (ADG)

Dimension the expansion tank with a capacity of 12% of the total hydraulic system volume.

Secure the expansion tank against shut-off. To do this, either use the shut-off options on the way to the expansion tank as cap valves, or unscrew the hand lever (handwheel) and attach it to the expansion tank with the wire in a clearly visible position.

Hydraulic switch

A hydraulic switch separates the flows in boiler and heating circuits. If the heating system is operated without a buffer tank, a hydraulic switch must be installed between flow and return.

Buffer tank: Use, dimensioning

The use of a buffer cylinder is to be recommended in any case, as the boiler can then always operate in the optimum load range. This prevents frequent and unnecessary boiler start-ups and significantly reduces the higher fuel consumption during start phases.

A further advantage is that there is always a certain volume available for heating, allowing a quick supply of heat.

A buffer tank also prolongs the service life of the boiler and reduces emissions.

For log wood boilers, a buffer volume of 55 litres per kW heating output is mandatory. However, a buffer volume of 70 litres per kW heating output provides more comfortable heating operation. For pellet boilers, a buffer volume of 30 litres per kW heating output is recommended, and for wood chip boilers 35 litres per kW heating output.

Return booster

Functioning: If cold heating water (temperature < 55°C) flows from the heating circuit/buffer tank into the hot boiler, the steam contained in the flue gas condenses on the "cool" boiler heat exchanger surfaces. In the long term this leads to corrosion and damage in the boiler.

To avoid this, hot water from the boiler flow is added to the boiler return.

Return booster modules with a motor-controlled mixer perform this task more accurately and reliably than thermally controlled modules.

In addition, they allow the use of residual heat: When the temperature in the buffer cylinder has fallen to lower than that in the burner, the pumps start up again, the return mixer opens, and the residual heat from the boiler is transferred to the buffer.

The use of a return booster module is a prerequisite for SOLARFOCUS warranty and guarantee claims.

7.2 Boiler connections

Boiler flow, boiler return

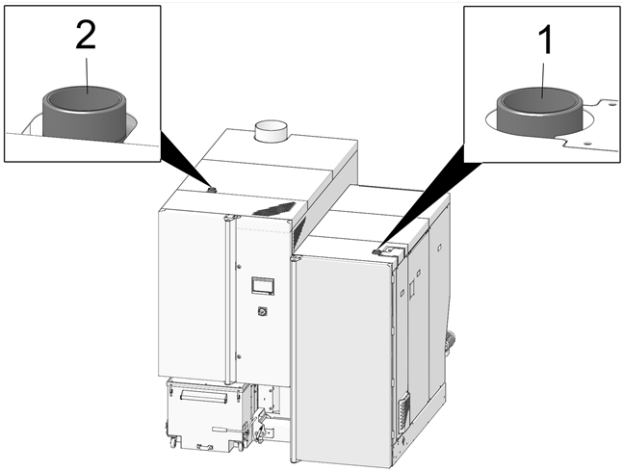


Fig. 2-36

1 Boiler flow, G 2“ OT
2 Boiler return, G 2“ OT

Feeler, immersion sleeves

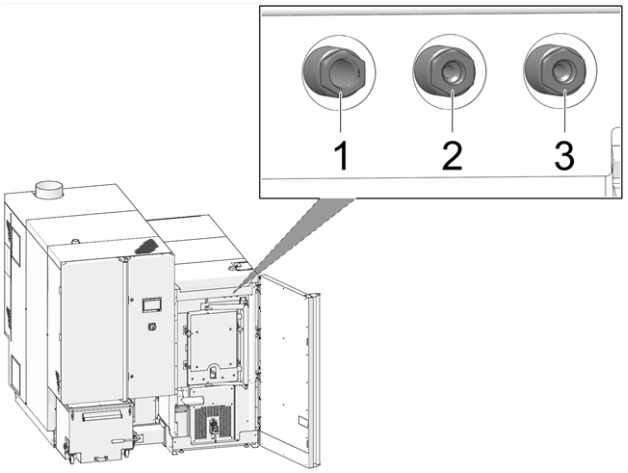


Fig. 2-37: Immersion sleeves on the burner

1 Sensor for thermal overload protection (TOP)
2 Boiler temperature sensor
3 Sensor for overtemperature reset button (STB)

Return flow sensor, pressure transmitter

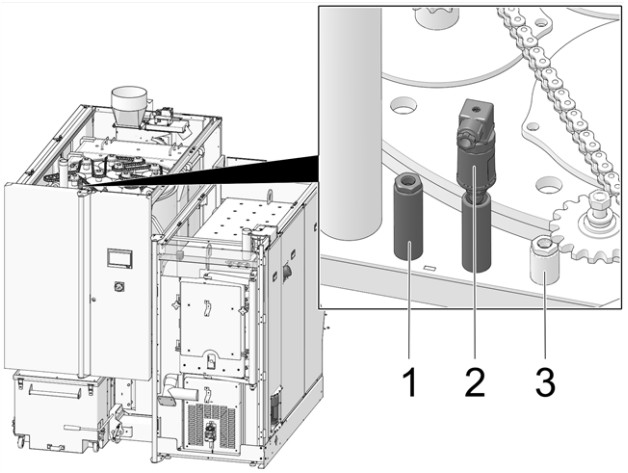


Fig. 2-38

1 Return sensor
2 Pressure transmitter
3 blank

Boiler draining

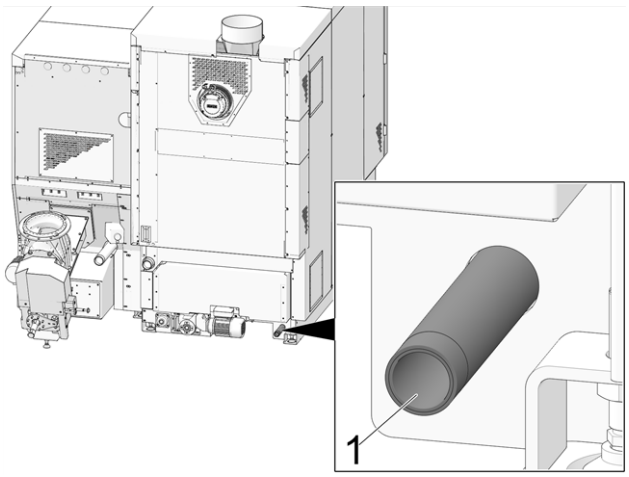


Fig. 2-39: Draining on the back of the heat exchanger

1 Boiler draining, G 1/ 2“ OT

Install thermal overload protection > 21

7.3 Make-up water requirements

Recommendation: Low salt driving - filling with demineralised water, see VDI 2035 sheet 2.

Water-side corrosion

Corrosion is usually triggered by the available oxygen in the water. This value can be brought into a safe range with proper planning, design, installation and maintenance of the heating system. A constant input of oxygen should be avoided

Important in this regard: **Check pressure maintenance at regular intervals** (operating pressure of the heating system, pressure in the expansion tank).

Formation of scaling

Scaling is the formation of firmly adhering deposits on water-contacting walls of hot water heating systems. The cause of scaling is the presence of limestone in the water.

Parameters that play a role in the formation of scaling:

- System volume (the bigger it is, the less total hardness is permissible, e.g. buffer tank fitted).
- Total heat output (the bigger it is, the less total hardness is permissible).

To determine the total allowable hardness, the *specific water content* must be determined.

$$\frac{\text{System volume (litres)}}{\text{Total heat output (kW)}} = \text{specific water content of the system (l/kW)}$$

Example:

$$\frac{1166\ \text{(litres)}}{25\ \text{(kW)}} = \mathbf{46.64\ (kW)}$$

The fill and make-up water should meet the following guideline values according to VDI 2035 Part 1.

Total heat output	Specific system volume (VDI 2035)		
	<20 l/kW	≥20 <50 l/kW	≥50 l/kW
< 50 kW	≤ 16.8°dH	≤ 11.2°dH	< 0.1°dH
50 - 200 kW	≤ 11.2°dH	≤ 8.4°dH	< 0.1°dH
20 - 600 kW	≤ 8.4°dH	< 0.1°dH	< 0.1°dH
> 600 kW	< 0.1°dH	< 0.1°dH	< 0.1°dH

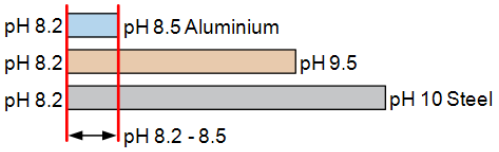
In the event of exceeding the above values, the filling water is to be treated (e.g., ion exchanger resin).

pH value

In the normal case (mixed installation) no measures are required to influence the pH **(control: value should be in the range of 8.2 to 9.5).**

For the resistance of the materials steel and copper in heating systems a pH in the alkaline range is favourable.

Exception: If aluminium materials are used in the heating system, a pH from 8.2 to 8.5 must be maintained (heavy corrosion of aluminium from pH > 8.5).



If the value is significantly less than < 8.2 after filling, then perform a check again after 8-12 weeks.

If no increase in pH could be achieved then add 10 g/m³ trisodium phosphate (Na_3PO_4) or 5g/m³ sodium hydroxide (NaOH).

Allow 2 to 4 weeks of operation before further corrections.

Electrical conductivity

The probability of corrosion usually decreases with decreasing electrical conductivity of the heating water.

Recommendation: Low salt driving - filling with demineralised water, see VDI 2035 sheet 2.

	Low salt
Electrical conductivity at 25°C	< 100 µS/cm

8 Electrical connection

DANGER - There is a risk of fatal electric shocks when working on electrical components of the system

- Work may be performed only by a qualified electrician.
- Applicable standards and regulations must be observed.

To be installed on site

Most of the electrical components are installed and electrically connected.

Components to be connected on site to the control cabinet (pre-wiring is available) on the front of the burner are listed here > 28

Components to be connected on the back of the burner (pre-wiring is available) are:

- Hot air fan > 19
- Feeder grate drive > 19
- Feeder unit (including feeder sensor) > 20
- Depending on the fuel delivery system, additional components:
  - see intermediate pellet store > 32
  - see delivery systems > 38

8.1 Boiler control cabinet

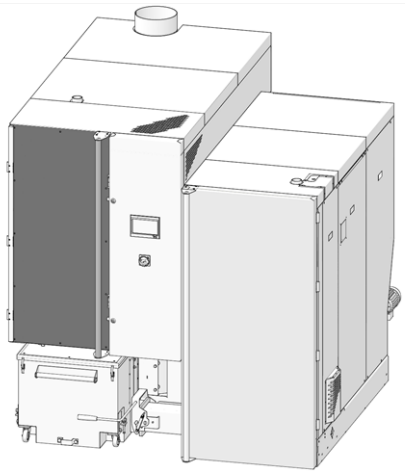


Fig. 2-40: Position of the control cabinet

Components (circuit boards,...) in the control cabinet

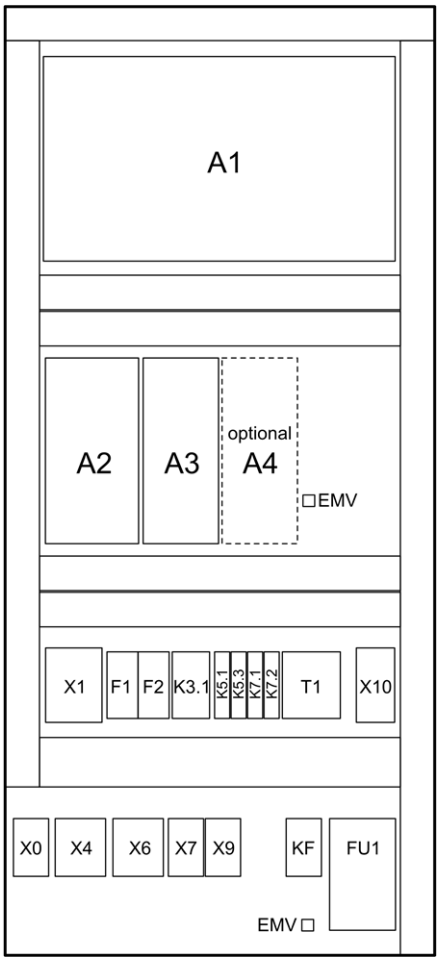


Fig. 2-41

Detailed illustrations of the power element A1 and the circuit boards A2 and A3 (A4) > 35

Position high voltage module_A5 > 36

8.2 Connection assignment

Designation	Connection
Ash extraction burner: Motor > 28	A1:X22
Ash extraction heat exchanger (and separator cleaning): Motor > 37	A1:X23
Ash extraction heat exchanger (and separator cleaning): Position switch > 37	A1:X48
Boiler temperature sensor (in the water jacket of the boiler) > 28	A1:X31
Buffer tank sensor Bottom	A1:X36
Buffer tank sensor Top	A1:X44
CAN Bus connection for electronic modules	A3:X6, A4:X6
Combustion chamber temperature sensor > 28	A2:X11
Control cabinet fan	A1:X19
Control cabinet temperature	A1:X30

Designation	Connection
Direct extraction 1*(RA1)*: Thermal contact + safety switch	X9.1-X9.2
Direct extraction 2*(RA2)*: Thermal contact + safety switch	X9.3-X9.4
Direct extraction motor 1 (*RA1*) > 38 1-phase with motor container auger (intermediate pellet store) 3-phase with direct extraction	A3:X2
Direct extraction motor 1 (*RA2*) > 38 3-phase: ‚Motor for bunker filling auger; or motor for climbing auger)	A4:X2
Direction extraction for suction systems (only for pellets, e.g. suction auger, mole) > 30	A1:X14
Display (Boiler control **eco**manager-*touch*)	A1:X53
Electrostatic separator 230 V supply for the high voltage module_A5 > 36	A1:X16
Electrostatic separator: Analog output 0-10V *actual current* for high voltage module_A5 > 36 (0-4mA)	A2:X10
Electrostatic separator: Analog output 0-10V *actual voltage* for high voltage module_A5 > 36 (0-30kV)	A2:X9
Electrostatic separator: Analog output 0-10V *nominal current* for high voltage module_ A5 > 36 (0-4mA)	A2:X8
Electrostatic separator: Analog output 0-10V *nominal voltage* for high voltage module_ A5 > 36 (0-30kV)	A2:X7
External boiler release (**maxi**mus releases additional boiler) > 30	A1:X28
External release of the boiler > 31	A1:X51
Fault > 31	A1:X29
Feed grate motor > 19	X4.7-X4.9
Feeder motor > 20	FU1: U,V,W
Feeder sensor > 20	A1:X33
Flue gas temperature sensor > 37	A1:X34
Heat exchanger cleaning - motor > 36	X4.10- X4.12
Hot air fan: Fan > 19	A1:X7
Hot air fan: Heating element > 19	A1:X4
Induced draft fan > 37	X4.1-X4.3
Intermediate pellet store: Container auger > 33	A3:X2
Intermediate pellet store: Container flap sensor > 33	A2:X12
Intermediate pellet store: Filling level sensor > 33	A1:X49
Intermediate pellet store: Suction turbine > 33	X4.13- X4.15
Lambda sensor > 36	A1:X45
Overtemperature reset (OTR) > 28	A1:X20 A1:X21
Power supply boiler 400V	X0
Return booster pump	X4.4-X4.6
Return mixer	A1:X13
Return sensor > 24	A1:X32
Rotary drive for flue gas booster > 36	
Rotary drive for primary air > 9	
Rotary drive for recirculation > 36	
Rotary drive for secondary air > 9	
safety chain (several safety devices are connected here), e.g. EMERGENCY OFF switch > 30 Ash box safety switch	X6.1-X6.8
Spare	A1:X6
Temperature monitor in fuel storage room (TM) > 21	X7.1-X7.2
Temperature monitor in fuel storage room (TM) > 21 : Warning device (optical or acoustic)	X7.3-X7.4

8.3 Voltage supply for the heating system

- A separate power circuit must be provided in the Boiler room for the heating system.
- Connection: 400 V AC, 50 Hz, 16 A, 3P+N+PE
- Connect the boiler with the plug CEE 5 x 16 A.
- Use a heat-resistant PVC or silicone cable with 5-pin min. 2.5 mm² as the supply cable.
- **Connect the two parts (burner and heat exchanger) to the potential equalisation conductor *1*.**
- **From this connection, connect the boiler to the potential equalisation rail of the house installation, conductor cross-section min. 10 mm².**

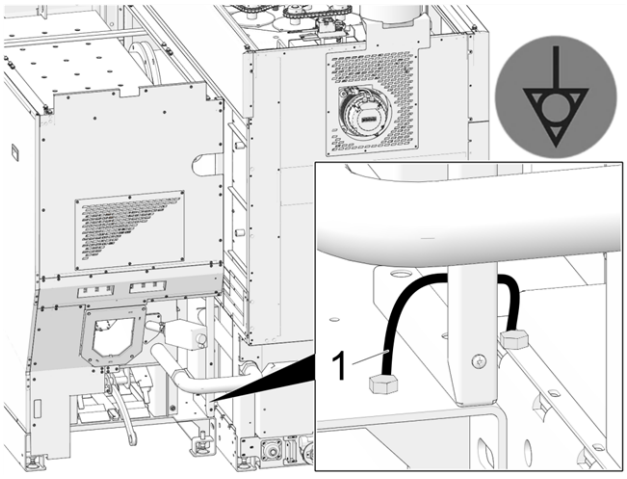


Fig. 2-42: Connect potential equalisation

8.4 Connect components to the control cabinet (on site)

For the following four components, the pre-wiring on the burner is present (the cables are in pre-routed in cable duct 1 > 31). The connection of the plug in the control cabinet must be made on-site.

- Overtemperature reset
- Boiler temperature sensor
- Combustion chamber temperature sensor
- Ash extraction burner

8.4.1 Connect overtemperature reset

► Connect overtemperature reset (OTR) *1* to **A1:X20**

► Protective conductor (yellow/green) to **A1:X21**

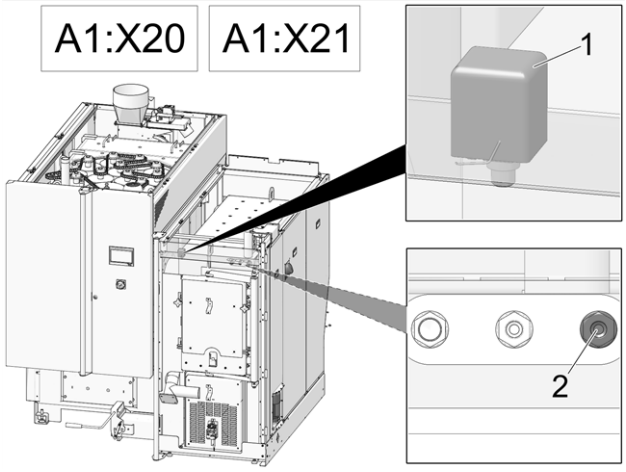


Fig. 2-43

1 Overtemperature reset (OTR)
2 Sensor for overtemperature reset

8.4.2 Connect the boiler temperature sensor

► Connect boiler temperature sensor *1* to **A1:X31**

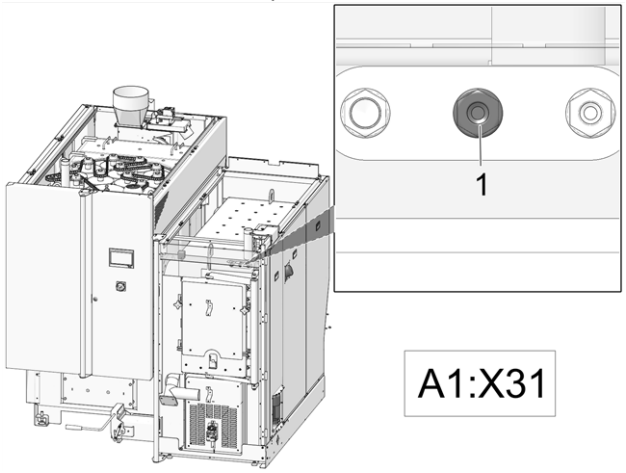


Fig. 2-44

8.4.3 Connect combustion chamber temperature sensor

► Connect combustion chamber temperature sensor *1* to **A2:X11**

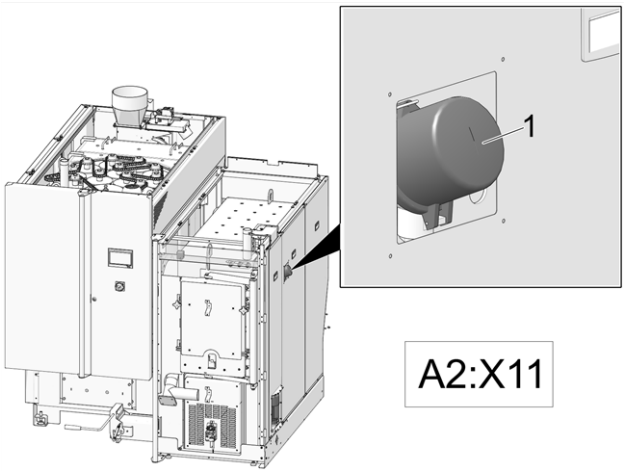


Fig. 2-45

8.4.4 Connect ash extraction burner

► Connect ash extraction motor *1* to **A1:X22**

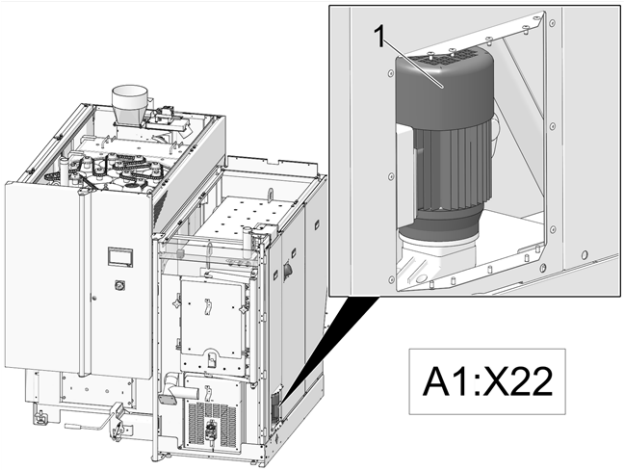


Fig. 2-46

8.4.5 Connect rotary actuators

The bus cables coming from the control cabinet (clamping area X10) of the heat exchanger include the following components when fully installed:

- **Rotary drive for primary air** > 36 (connect on site)
- **Rotary drive for secondary air** > 36 (connect on site)
- Rotary drive for flue gas recirculation > 36
- Rotary drive for flue gas booster
- Induced draft fan > 37

► Connect the two bus cables *1* to terminal **X200** (front of burner, primary air).

► Connect the two bus cables *2* to terminal **X201** (back of burner, secondary air).

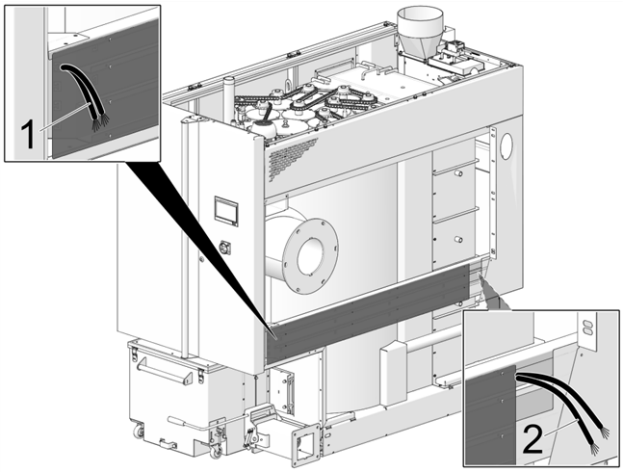
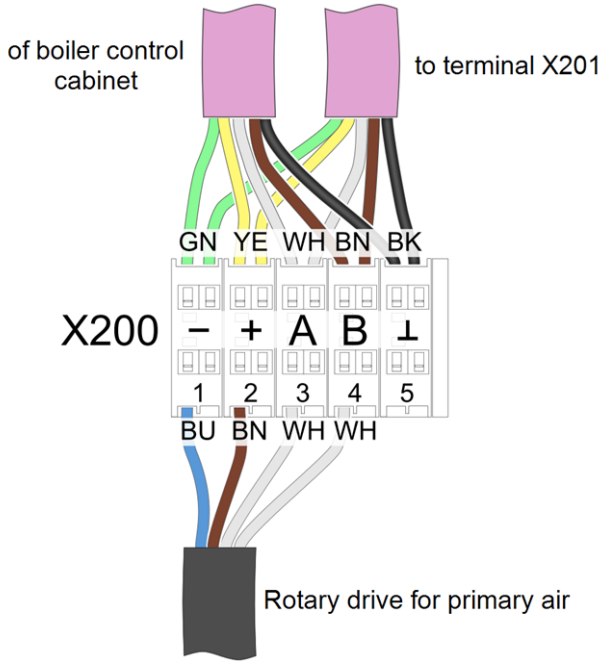
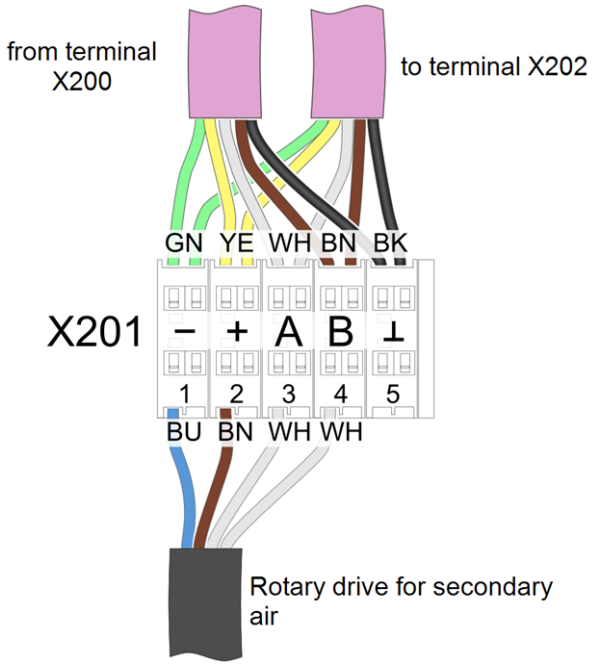


Fig. 2-47: Connection of the bus cable

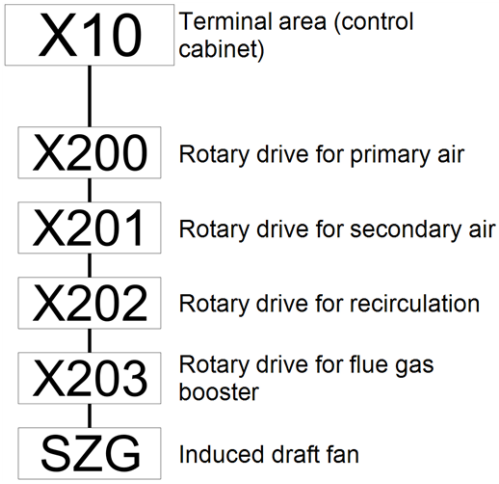
Terminal X200 (rotary drive for primary air)



Terminal X201 (rotary drive for secondary air)



Order of bus participants



8.5 Connect additional components (on site)

Install EMERGENCY OFF switch

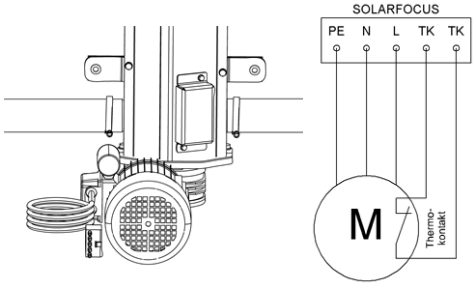
Austria: Firing systems for which a heating room is required must be equipped with an EMERGENCY OFF switch, which must not have an effect on the room lighting. It must be situated immediately outside the access door and labelled clearly and visibly. This switch may also be located inside the heating rooms, immediately next to the access doors, but only if the heating rooms can be accessed from outdoors.

- ► Integrate the emergency stop switch into the safety chain of the boiler, connection **X6.1-X6.8**
- ► Connect other components integrated in the safety chain in series ("loop through")

Pellet delivery system (A1:X14)

Suction system delivery auger

- ► Use 5x1.5 mm² cable

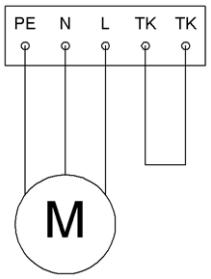


5-pin connector, direct extraction motor	Terminal *X14* on the power element
PE	PE
N	N
L	L
	TK
	TK

OEM system

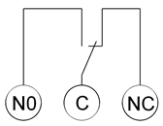
Use e.g. for pellet box transfer unit auger and for the *pellet mole* (these systems have a motor–thermal protection is integrated).

- ► Use 3x1,5 mm² cable
- ► Bridge the two TK terminals on the boiler power element.



External boiler request (A1:X28)

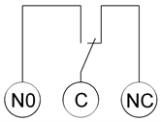
Potential-free Relay output for switching an external boiler, for example, an external boiler is controlled by the SOLARFOCUS boiler control



! **CAUTION** – The connection is floating and has a maximum load of 5A.

Malfunction (A1:X29)

Potential-free relay output, for example, to switch a warning device (optical/acoustic). Triggered in the event of a malfunction on the boiler.



! **CAUTION** – The connection is floating and has a maximum load of 5A.

External request (A1:X51)

Input, i.e., the SOLARFOCUS boiler can be started by an external control.

! **CAUTION**–The connection must be floating.

8.6 Cable ducts on the boiler

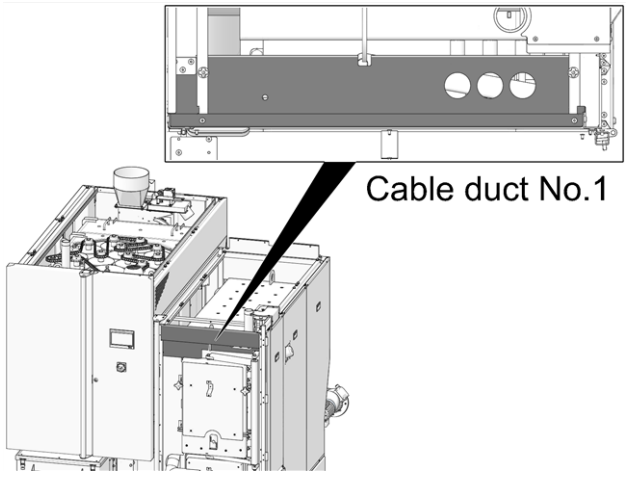


Fig. 2-48: Burner front top

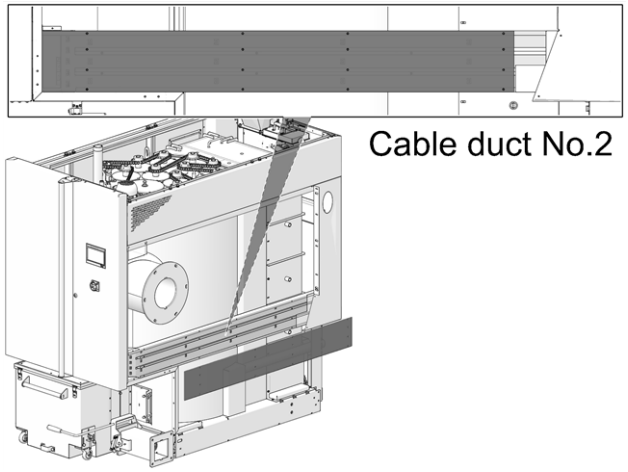


Fig. 2-49: Heat exchanger longitudinal side

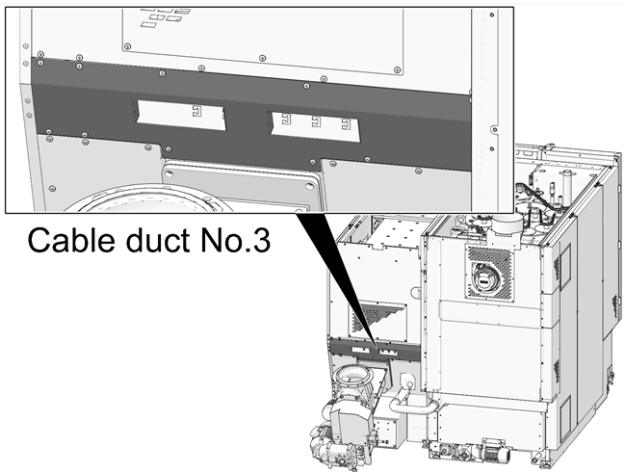


Fig. 2-50: Burner rear

8.7 Sensor resistance table

Type	KTY 81-110	PT100	PT1000	KTY 81-210
Tolerance	± 3 %	± 0.7 %	± 1 %	± 3 %
°C	Ohm	Ohm	Ohm	Ohm
-20	684	92.16	922	1367
-10	747	96.09	961	1485
0	815	100	1000	1630
10	886	103.9	1039	1772
20	961	107.79	1078	1922
25	1000	109.74	1097	2000
30	1040	111.69	1117	2080
40	1122	115.54	1155	2245
50	1209	119.4	1194	2417
60	1299	123.24	1232	2597
70	1392	127.07	1271	2785
80	1490	130.8	1309	2980
100	1696	138.5	1385	3392
120	1915	146.06	1461	3617
140	2124	153.58	1536	4186
150	2211	157.31	1573	4280
160	-	161.04	-	-
170	-	164.76	-	-
180	-	168.46	-	-
190	-	172.16	-	-

8.8 Connecting the control to the internet

To enable the Internet connection of the **eco**manager-*touch* boiler control, connect the Ethernet port **X2** (type RJ45) on the bottom of the display by cable to a network router.

The connection is required in order to use the following functions:

- mySOLARFOCUS app
- Weatherman function
- Screen IP-VNC - Remote access to the control
- Sending e-mails

Additional information on these functions can be found in the operation manual.

Display - Connections

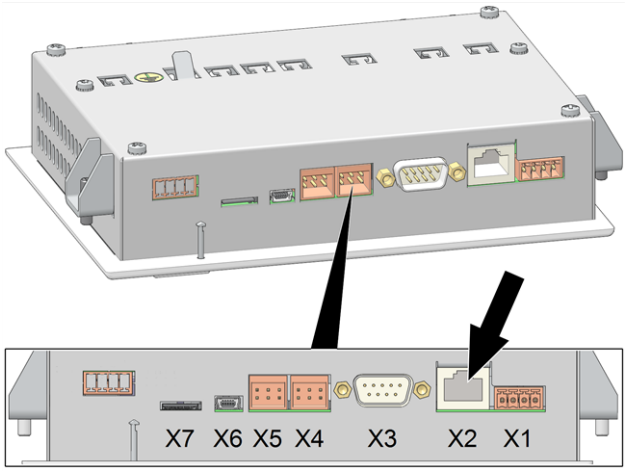


Fig. 2-51: Connections on the underside of the display

Access to the read of the display

► Lift cover upwards.

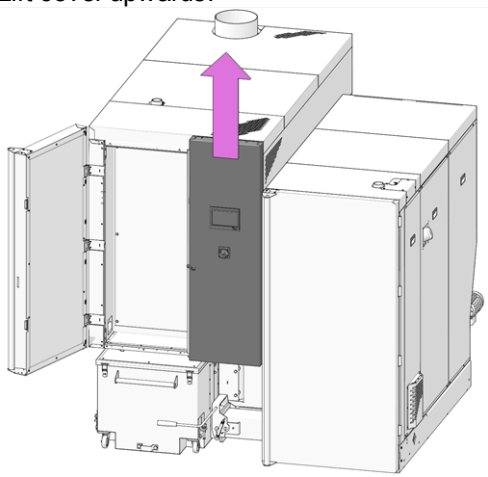


Fig. 2-52

9 Installing the intermediate pellet store

Connect angle compensation

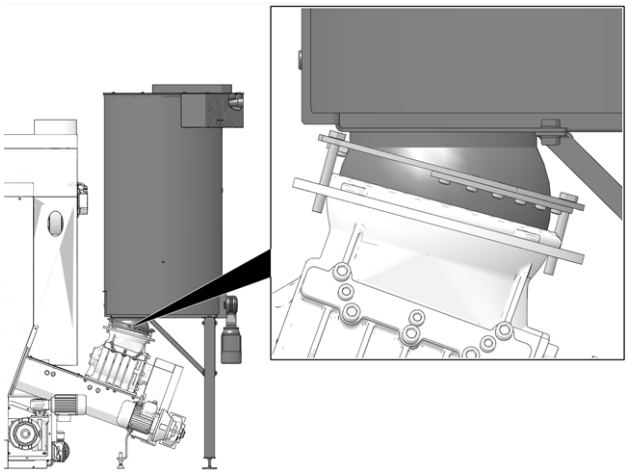


Fig. 2-53

Fix retaining plates to the floor

► Fix 2 pcs. Retaining plates *1* to the floor with screws.

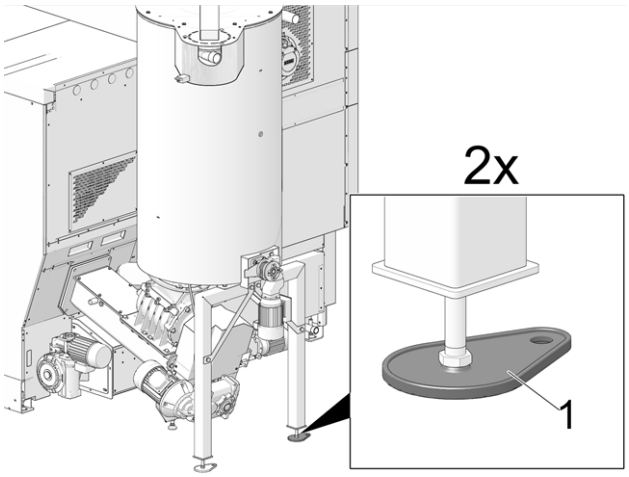


Fig. 2-54

Connect pellet hose

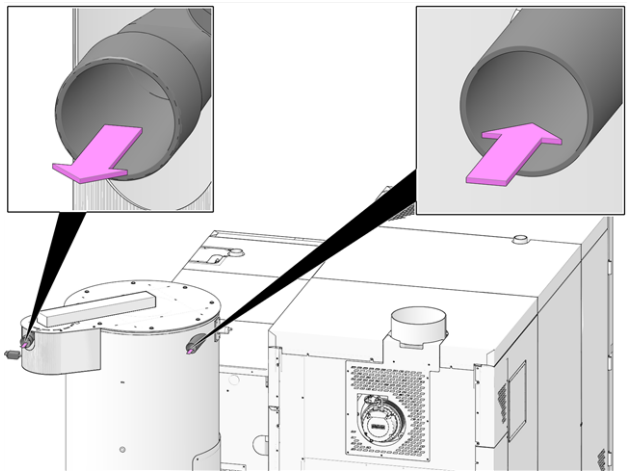


Fig. 2-55

Notes on installing the pellet hose > 37

Connect electrical components

► Connect components, the cables are in pre-routed in ducts 3 and 2 > 31.

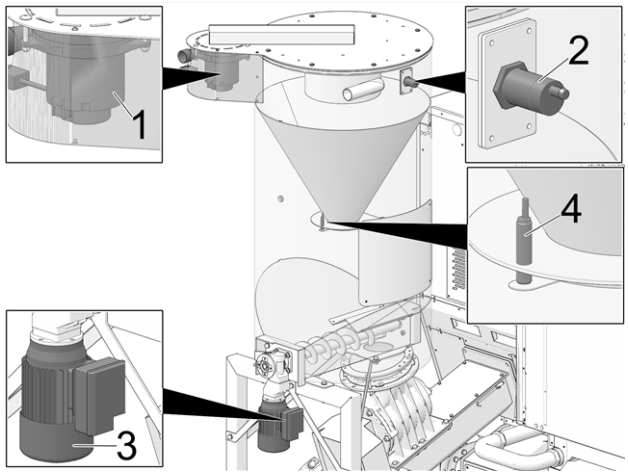


Fig. 2-56: Intermediate pellet store

1	Pellet suction turbine	X4.13-X4.15
2	Filling level sensor	A1:X49
3	Container auger motor (*Direct extraction motor 1*)	A3:X2
4	Container flap sensor	A2:X12

Connect the motor of the container auger

► Connect the pre-routed cable as shown in the terminal area of the motor.

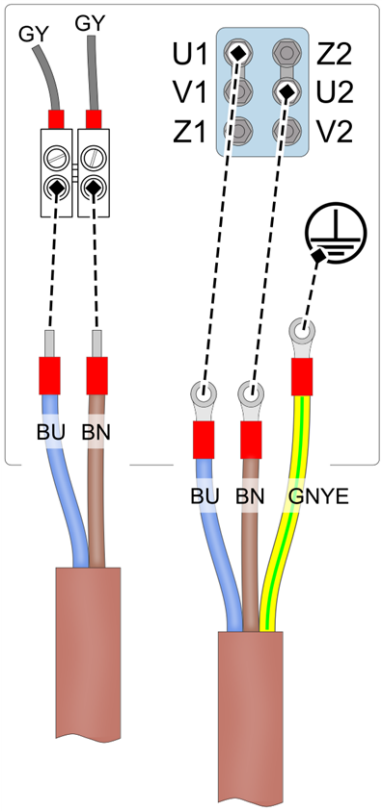


Fig. 2-57: Connect the cable in the motor terminal area

10 Initial start-up

Initial commissioning of the boiler may only be performed by certified personnel (SOLARFOCUS service technician or SOLARFOCUS specialist service partner) (= condition for guarantee, warranty).

☑ The boiler is hydraulically connected.
☑ The heating system is filled with water and has been vented.
☑ The boiler is electrically connected.

► Connect the boiler to the mains power supply.
► Carry out the commissioning routine in the boiler control.

After having completed initial commissioning, the completed commissioning form should be returned to SOLARFOCUS. If this does not happen, then for guarantee and warranty claims of any kind the date of shipment from the manufacturer to the dealer (according to the delivery note and invoice) will be used.

11 Annex

11.1 Boiler covers - overview

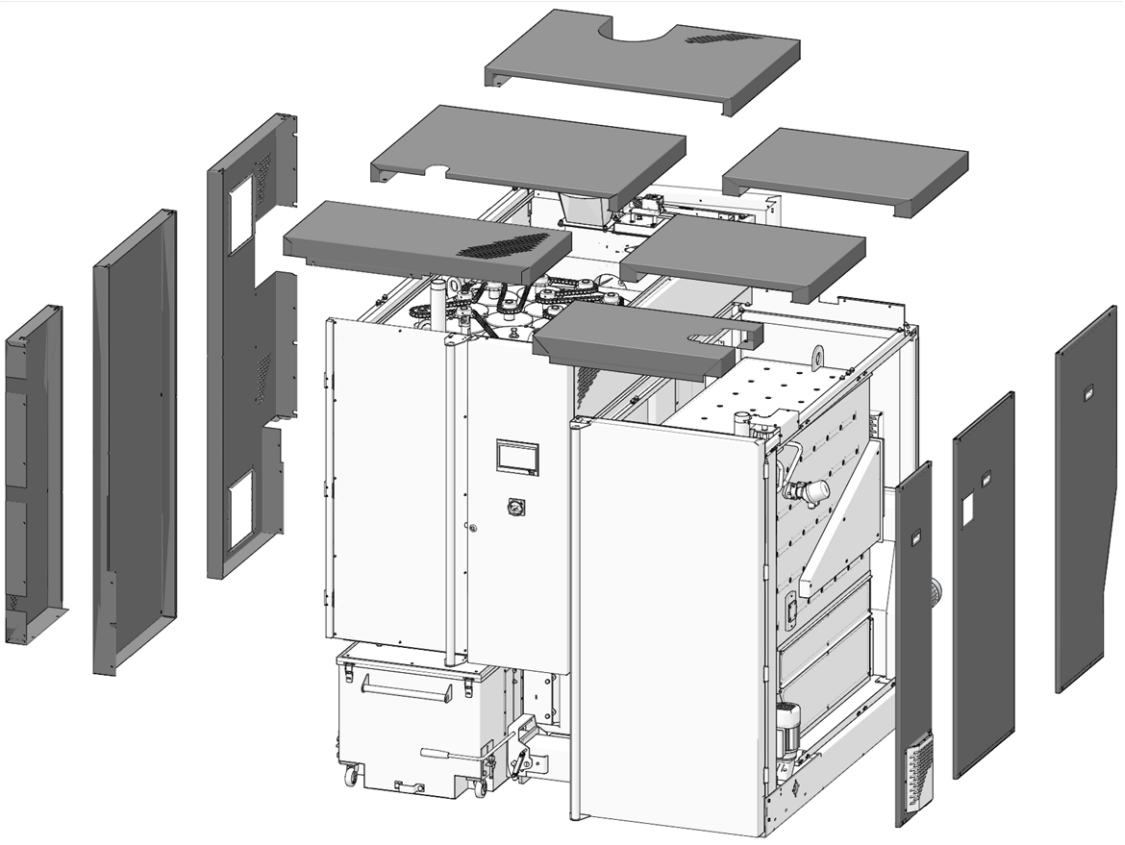


Fig. 2-58

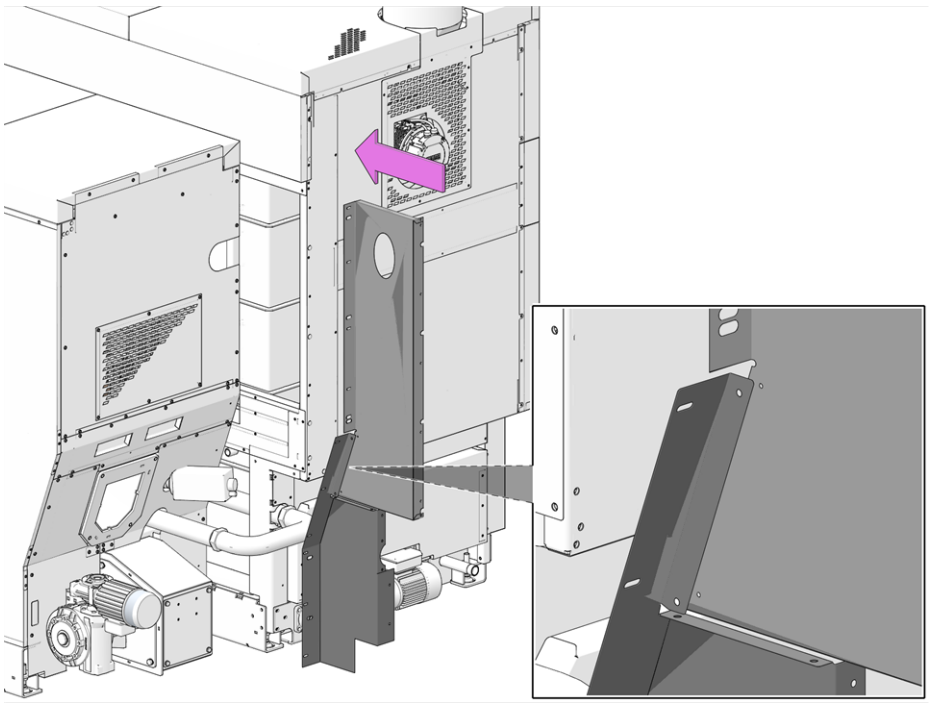


Fig. 2-59

11.2 Boiler power element, circuit boards

Boiler power element_A1

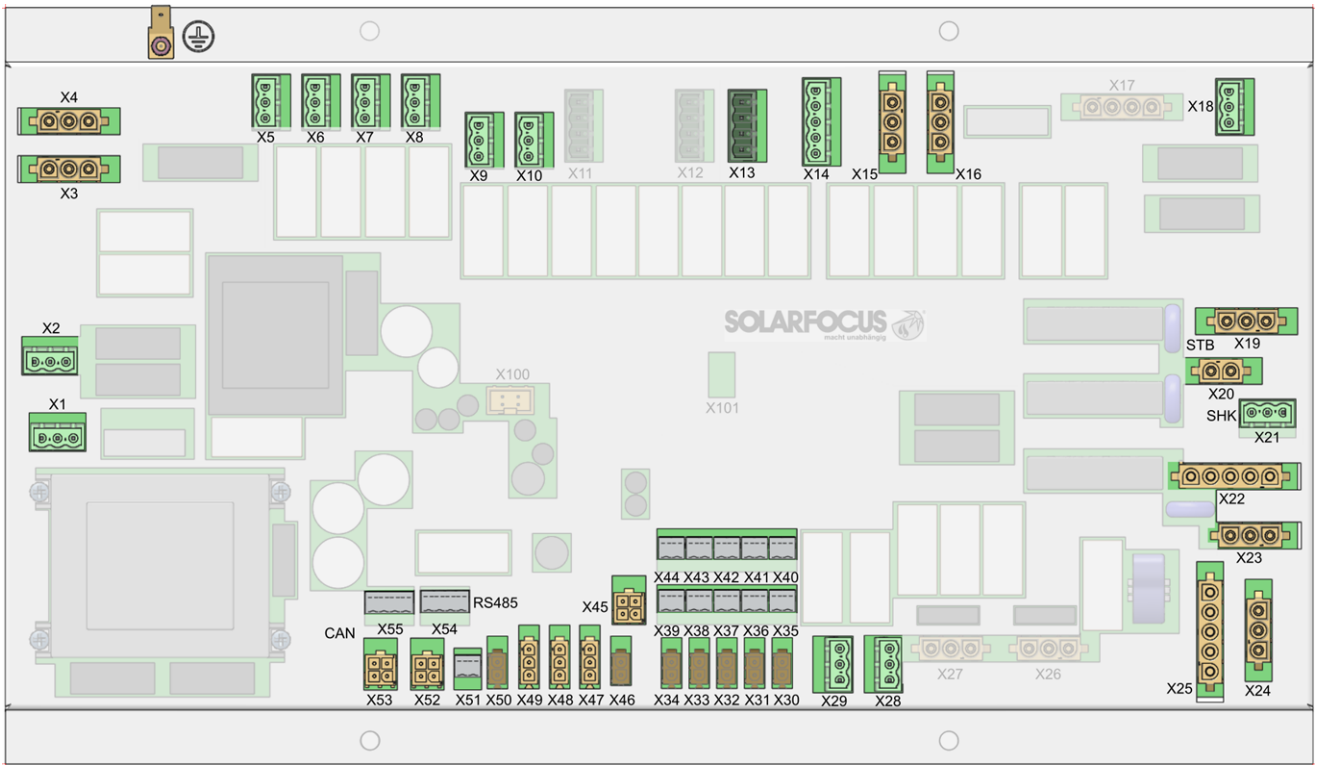


Fig. 2-60

Circuit board_A2

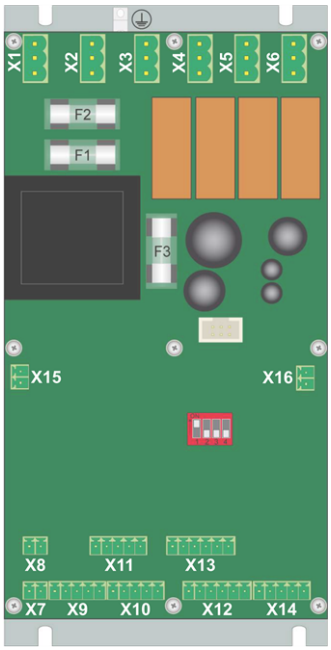


Fig. 2-61

Circuit board_A3 (or optional circuit board_A4)

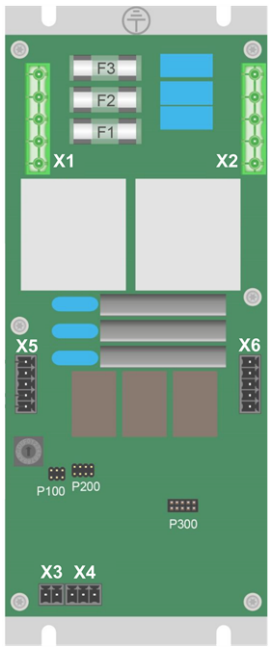


Fig. 2-62

Circuit board_A3 = *Direct Extraction 1*
Circuit board_A4 = *Direct Extraction 4*

11.3 Electrical components: Overview

The components listed below are factory-installed and -connected, i.e. no assembly/installation work is required on site.

The information given here is intended to contribute to a better understanding or facilitate the locating of components in the event that they need to be replaced.

Burner: Front

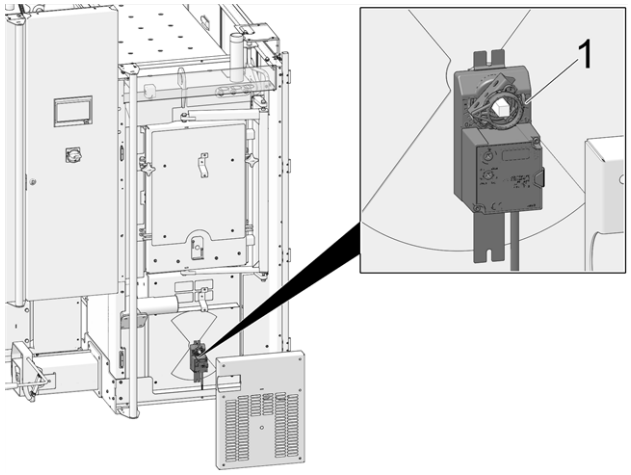


Fig. 2-63

1 Rotary drive for primary air

Burner: Back

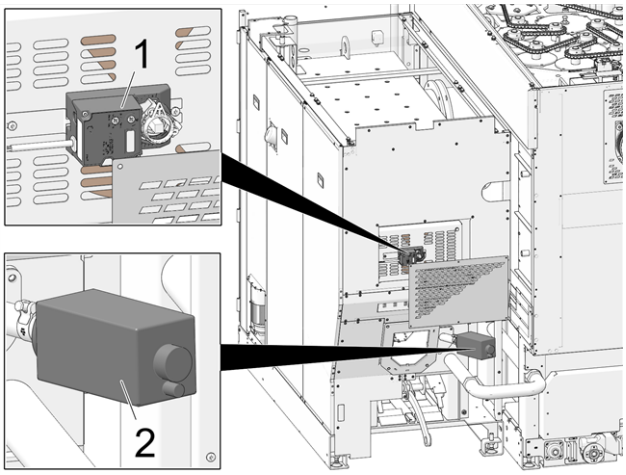


Fig. 2-64

1 Rotary drive for secondary air
2 Hot air fan

Heat exchanger: Top side

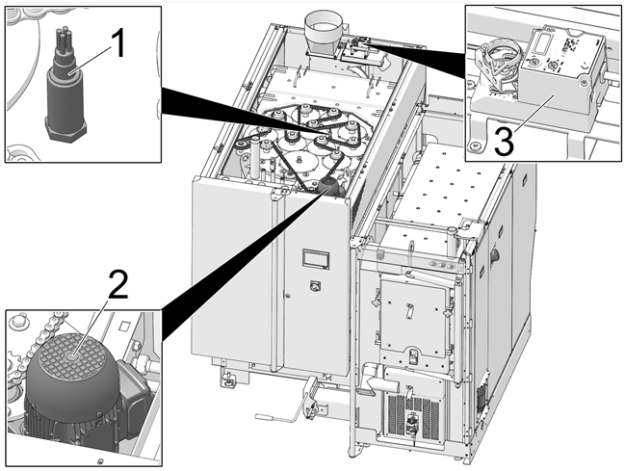


Fig. 2-65

1 Lambda sensor
2 Motor for heat exchanger cleaning
3 Rotary drive for flue gas recirculation

Heat exchanger: Side

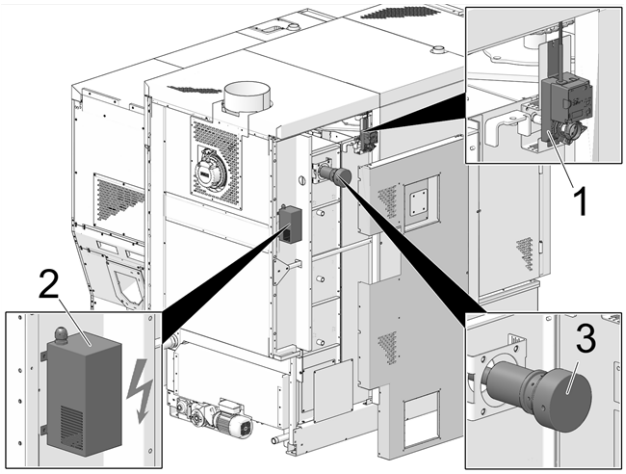


Fig. 2-66

1 Rotary drive for flue gas booster
2 High-voltage module_A5 (for the electrostatic separator)
3 High voltage electrode with insulator

Heat exchanger: Back

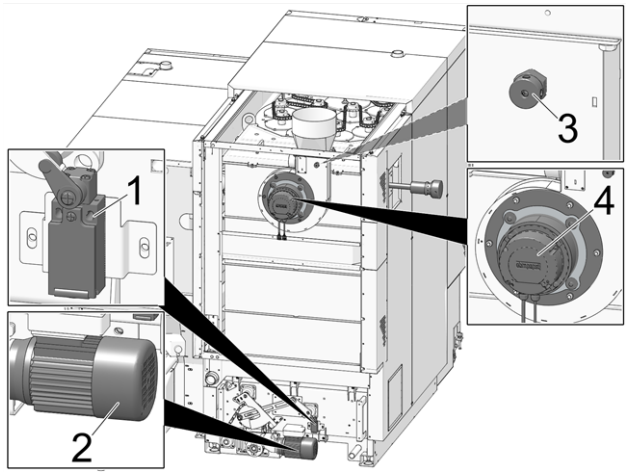


Fig. 2-67

1 Position switch (for ash extraction heat exchanger)
2 Motor for separator cleaning and ash extraction heat exchanger
3 Holder for flue gas temperature sensor
4 Induced draft fan

11.4 Connect pellet hose

When installing the hose, observe the maximum permissible values.

Maximum hose length and delivery height

Routing	Max. Hose length	Max. Delivery height
Suction head to suction head diverter	10 m	1 m
Suction head diverter to boiler	20 m	2.5 m
Total delivery path	30 m	3.5 m

Observe the following when installing hoses

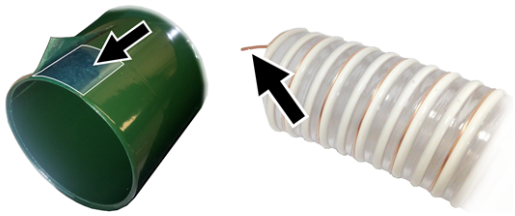
- The hose must be attached to the floor at several points (e.g. with perforated tape) to prevent it from 'floating' upwards (in the case of floor-mounting, e.g. suction head).
- Route hose as straight as possible. To avoid sagging of SOLARFOCUS articles, use a *support shell made of zinc-plated sheet steel*.
- Do not kink the hose (observe bending radius of > 30 cm).
- The hose is not UV-resistant (routing outdoors is not permissible).
- Temperature resistance of the hose < 60°C.
- Always push the end of the hose fully onto the pipe connection as far as the stop. The hose will slide on to the connection pipe better if you apply a little water to the pipe.
- Tighten hose clamps firmly. Detachment of the hose and the intake of false air must be reliably prevented.

Electrically earth the pellet hose

A metal braid is integrated into the inside of the plastic hose coil. This metal braid must be electrically connected to each hose end and the connecting pipe (for suction and return air hose).

► Expose approx. 10 cm of plastic coil at the end of the hose.
► Expose the metal braid using wire strippers.
► Curve the metal braid and bend it onto the inside of the hose.
► Connect hose.

! **CAUTION** - The metal braid must have permanent electrically conductive contact to the connecting pipe. Remove adhesive tape on the connection pipes and/or scrape off the existing coating.



11.5 Delivery systems (pellets, wood chips)

Pellets

Suction heads and diverter for suction heads manual or automatic

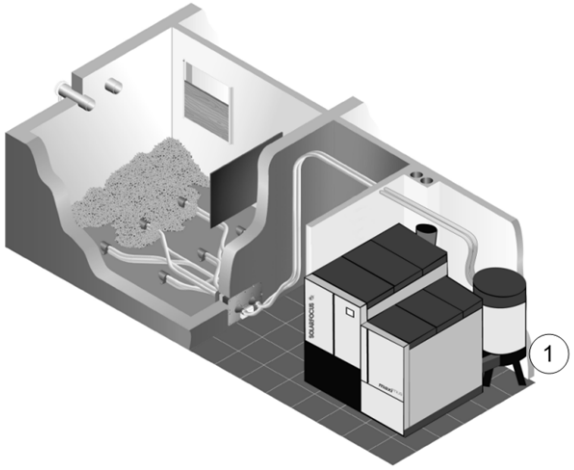


Fig. 2-68

1 Container auger motor > 33 (=*direct extraction motor 1*), connection **A3:X2**

Suction system auger conveyor

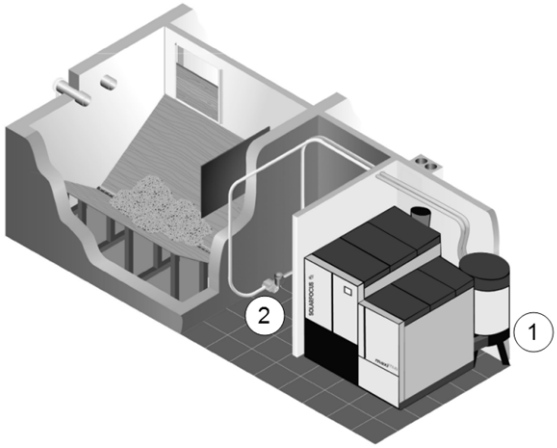


Fig. 2-69

1 Container auger motor > 33 (=*direct extraction motor 1*), connection **A3:X2**
2 Pellet delivery auger =direct extraction motor 2, connection **A1:X14**

Mole suction system

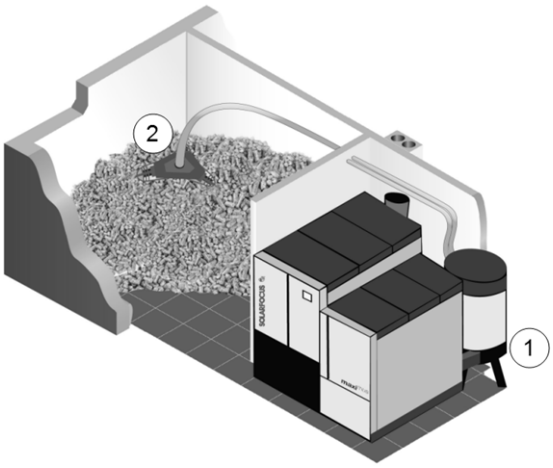


Fig. 2-70

1 Container auger motor > 33 (=*direct extraction motor 1*), connection **A3:X2**
2 Connect mole to A1: X14, the parameter in the manufacturer's manual is called *Boiler request* (mole is unlike *direct extraction motor* 2)

Wood chips

Direct extraction with leaf spring agitator

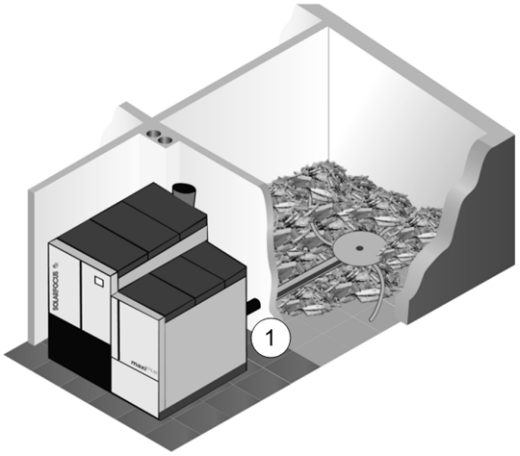


Fig. 2-71

1 Direct extraction auger motor (=*direct extraction motor 1*), connection **A3:X2**

Direct extraction with articulated arm agitator

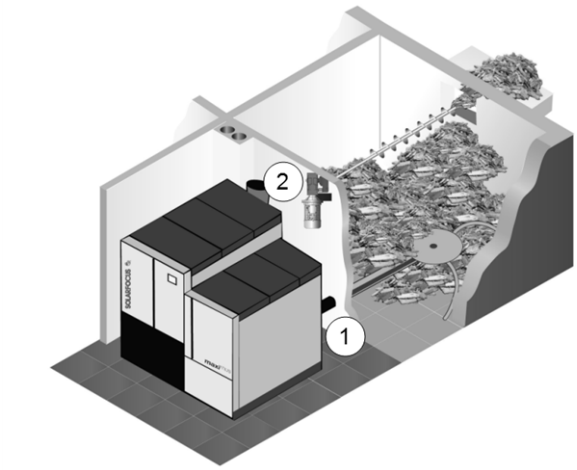


Fig. 2-72

1 Direct extraction auger motor (=*direct extraction motor 1*), connection **A3:X2**
2 Bunker filling auger motor (=*direct extraction motor 2*), connection **A4:X2**

Direct extraction by downpipe

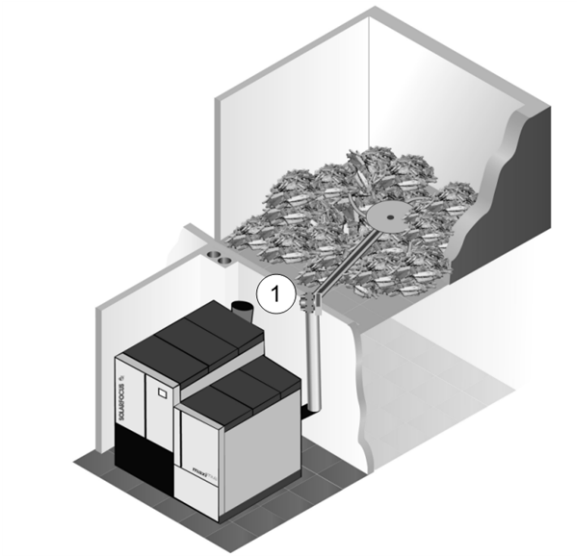


Fig. 2-73

1 Direct extraction auger motor (=*direct extraction motor 1*), connection **A3:X2**

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