

Installation Instructions  
Wood chip boiler TX 200-250



**Translation of the original German operating instructions for technicians!**

Read and follow the instructions and safety information!

Technical changes, typographical errors and omissions reserved!

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# Contents

<b>1</b>	<b>General</b>	<b>4</b>
<b>2</b>	<b>Safety</b>	<b>5</b>
2.1	Hazard levels of warnings	5
2.2	Qualification of assembly staff	6
2.3	Personal protective equipment for assembly staff	6
2.4	Design Information	7
2.4.1	Notes on standards	7
	<i>General standards for heating systems</i>	7
	<i>Standards for structural and safety devices</i>	7
	<i>Standards for heating water</i>	7
	<i>Regulations and standards for permitted fuels</i>	8
2.4.2	Installation and approval of the heating system	8
2.4.3	General information for installation room (boiler room)	8
2.4.4	Requirements for central heating water	9
2.4.5	Notes for using pressure maintenance systems	9
2.4.6	Return lift	10
2.4.7	Use with storage tank	10
2.4.8	Chimney connection/chimney system	11
	<i>Draught limiter</i>	11
	<i>Measuring port</i>	12
	<i>Boiler data for planning the flue gas system</i>	12
<b>3</b>	<b>Technik</b>	<b>13</b>
3.1	Abmessungen	13
3.2	Technische Daten	14
<b>4</b>	<b>Assembly</b>	<b>16</b>
4.1	Transport	16
4.2	Positioning	16
4.3	Temporary storage	16
4.4	Set-up in the boiler room	16
4.4.1	Moving the boiler in the boiler room	16
4.4.2	Minimum distances in the boiler room	17
4.5	Mounting steps	18
4.5.1	General information	18
4.5.2	Screwing the fire box with the heat exchanger	19
4.5.3	Installing sensor of thermal discharge system	20
4.5.4	Assembly of fireclay blocks	21
4.5.5	Preparation of flue gas recirculation connection (Option)	22
4.5.6	Retrofitting the WOS bar (if necessary)	23
4.5.7	Installing lower main frame of insulation	24
4.5.8	Installing upper main frame of insulation	25
4.5.9	Installing the frame for the insulating door	26
4.5.10	Installing the insulating side panels	27
4.5.11	Complete the heat exchanger cover and the combustion chamber door	30
4.5.12	Check grate settings and install the tipping grate motor	31
4.5.13	Installing the fire box ash removal unit	33
4.5.14	Installing the switch cabinet and cable ducts	37

4.5.15	Installing the stoker unit	39
4.5.16	Installing the automatic igniter	40
4.5.17	Installing the actuators of the air flaps	41
4.5.18	Installing overpressure monitor and temperature sensor	42
4.5.19	Installing the underpressure measurement	43
4.5.20	Installing the WOS drive	44
4.5.21	Heat exchanger ash removal unit with ash box	46
4.5.22	Heat exchanger ash removal unit with ash screw (optional)	47
4.5.23	Installing the combustion air blower fan	54
4.5.24	Installing the STL and the boiler sensor	55
4.5.25	Installing the ID fan	56
4.5.26	Installing the FGR air box (optional)	57
4.5.27	Installing the flue gas recirculation FGR (optional)	58
4.5.28	Installing insulating door and cover plates	60
<b>4.6</b>	<b>Electrical connection</b>	<b>61</b>
4.6.1	Installing insulating covers and cover plates	61
	<b>Connecting the hydraulic safety devices</b>	<b>63</b>
<b>5</b>	<b>Start-up</b>	<b>65</b>
5.1	<b>Before commissioning / configuring the boiler</b>	<b>65</b>
5.2	<b>Initial startup</b>	<b>66</b>
5.2.1	Permitted fuels	66
	<i>Wood pellets</i>	66
	<i>Wood chips</i>	66
5.2.2	Non-permitted fuels	66
5.2.3	Heating up for the first time	67
<b>6</b>	<b>Decommissioning</b>	<b>68</b>
6.1	<b>Mothballing</b>	<b>68</b>
6.2	<b>Disassembly</b>	<b>68</b>
6.3	<b>Disposal</b>	<b>68</b>
<b>7</b>	<b>Appendix</b>	<b>69</b>
7.1	<b>Addresses</b>	<b>69</b>
7.1.1	Address of manufacturer	69
7.1.2	Address of the installer	69

## 1 General

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

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

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

Subject to technical change.

### *Issuing a delivery certificate*

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

## 2 Safety

### 2.1 Hazard levels of warnings

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

#### DANGER

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

#### WARNING

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

#### CAUTION

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

## 2.2 Qualification of assembly staff



### CAUTION

**Assembly and installation by unqualified persons:**

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

During assembly and installation:

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

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

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

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

## 2.3 Personal protective equipment for assembly staff

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



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

## 2.4 Design Information

### 2.4.1 Notes on standards

The system must be installed and commissioned in accordance with the local fire and building regulations. Unless contrary to other national regulations, the latest versions of the following standards and guidelines apply:

#### *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

#### *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
TRVB H 118	Technical directives for fire protection/prevention (Austria)

#### *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 in water heating systems (Germany)
SWKI 97-1	Water quality for heating, steam, cooling and air conditioning systems (Switzerland)
D.P.R. n° 412	Regulations for the planning, installation, running/operation and maintenance of heating systems in buildings to reduce energy consumption with reference to Article 4, Comma 4 of the Legislative Decree of 9 January 1991, No. 10 (Italy)

### *Regulations and standards for permitted fuels*

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

### 2.4.2 Installation and approval of the heating system

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

#### *Note on standards*

EN 12828 - Heating Systems in Buildings

#### **NOTICE! Each heating system must be officially approved.**

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

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

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

### 2.4.3 General information for installation room (boiler room)

#### *Boiler room characteristics*

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

### ***Ventilation of the boiler room***

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

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

#### ***Note on standards***

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

## **2.4.4 Requirements for central heating water**

#### ***Note on standards***

Austria:	ÖNORM H 5195
Germany:	VDI 2035
Switzerland:	SWKI 97-1
Italy:	D.P.R. no. 412

**NOTICE! Note on filling with make-up water: Always bleed the filling hose before connecting, in order to prevent air from entering the system.**

Observe the standards and also follow the recommendations below:

- Max. cumulative value for alkaline earth: 1.0 mmol/l or 100 mg/l (equivalent to 5.6 dH)
- Use prepared water which complies with the standards cited above for filling and makeup water
- Avoid leaks and use a closed heating system to maintain water quality during operation

## **2.4.5 Notes for using pressure maintenance systems**

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

### ***Compressor-controlled pressure maintenance***

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

### *Pump-controlled pressure maintenance*

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

## 2.4.6 Return lift

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

### CAUTION

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

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

Take the following precautions:

- Regulations stipulate the use of a return temperature control.
  - The minimum return temperature is 60 °C. We recommend fitting some sort of control device (e.g. thermometer).

## 2.4.7 Use with storage tank

### NOTICE

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

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

⇒ See "Addresses" [page 69]

### 2.4.8 Chimney connection/chimney system



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

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

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

Local regulations and other statutory regulations also apply.

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

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

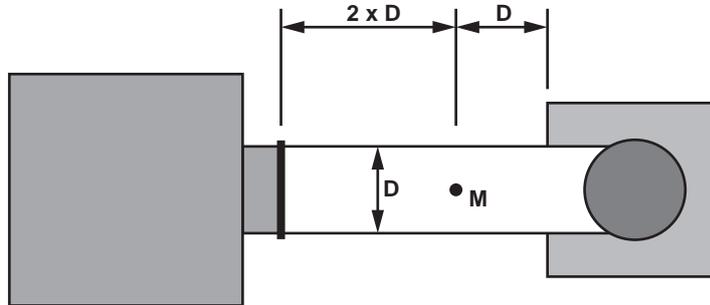
#### *Draught limiter*

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.**

### Measuring port

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



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

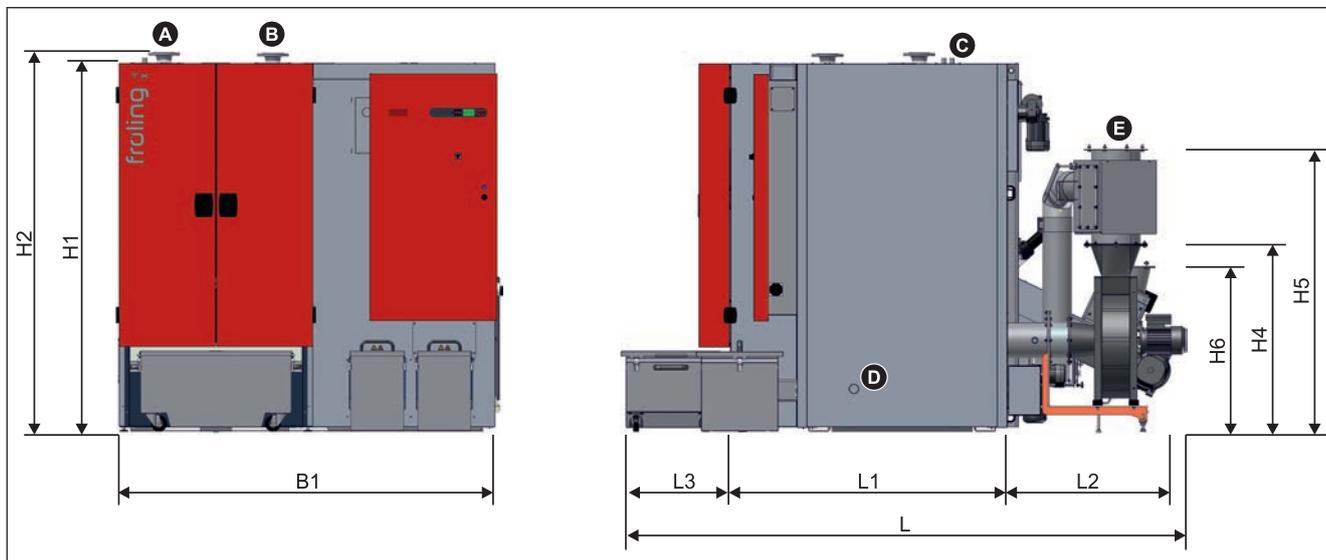
For the measuring port, ensure that the outside diameter of the sampling probes can accommodate up to 13 mm. To avoid the ingress of false air, the measuring port can have a maximum diameter of 21 mm.

### Boiler data for planning the flue gas system

Description		TX			
		200 (199 kW)	200 (205 kW)	225	250
Flue gas temperature at nominal load	°C	150			
Flue gas temperature at partial load		110			
Flue gas mass flow - wood chips W30, 12% O <sub>2</sub> *	m <sup>3</sup> /h	895	922	1012	1125
	kg/h	754	777	853	948
Flue gas mass flow - wood chips W30, 9% O <sub>2</sub>	m <sup>3</sup> /h	655	674	740	823
	kg/h	551	567	623	692
Flue gas mass flow - pellets, 12% O <sub>2</sub> *	m <sup>3</sup> /h	743	765	840	934
	kg/h	633	652	716	796
Flue gas mass flow - pellets, 9% O <sub>2</sub>	m <sup>3</sup> /h	543	559	614	682
	kg/h	463	477	524	582
Required feed pressure at nominal load	Pa	5			
	mbar	0,05			
Required feed pressure at partial load	Pa	2			
	mbar	0,02			
Maximum permissible feed pressure	Pa	30			
	mbar	0,3			
Flue spigot diameter	mm	250			
* use higher oxygen content for chimney design!					

## 3 Technik

### 3.1 Abmessungen



Item	Description	Unit	TX 200 - 250
H1	Height, boiler	mm	1880
H2	Height, flow and return connection		1935
H4	Height, flue pipe connection without FGR		960
H5	Height, flue pipe connection with FGR		1445
H6	Height, stoker unit with rotary valve		865
B1	Overall width	mm	2070
L	Length, boiler	mm	2980
L1	Length, retort		1400
L2	Length, stoker unit		970
L3	Length, ash box		610

Item	Description	Unit	TX 200 - 250
A	Boiler outfeed connection	Zoll	2½
B	Boiler return connection		2½
C	Connection of thermal discharge safety device (near boiler flow connection)		½
D	Boiler drainage connection		¾
E	Flue spigot diameter	mm	250

## 3.2 Technische Daten

Description		TX			
		200	200 <sup>1)</sup>	225	250
Rated heat output	kW	199	205	225	250
Output range	kW	60 - 199	61,5 - 205	67,5 - 225	75 - 250
Electrical connection		400V / 50Hz / C35A			
Total weight of boiler	kg	3390			
Weight – retort		1120			
Weight - heat exchanger		1280			
Boiler capacity (water)	l	570			
Water pressure drop ( $\Delta T = 10 / 20$ K)	mbar	55 / 18	57 / 19	65 / 22	74 / 25
Min. boiler return temperature	°C	65			
Max. permitted operating temperature	°C	90			
Permitted operating pressure	bar	3			
Boiler class as per EN 303-5:2012		5			
Permitted fuel as per EN 17225 <sup>2)</sup>		Part 2: Wood pellets class A1 / D06 Teil 4: Wood chips class A1 / P16S-P31S			
Airborne sound level	dB(A)	< 70			

	200	200	225	250
Testing institute	TÜV <sup>4) 5)</sup>	TÜV <sup>4) 5)</sup>	TÜV <sup>4) 5)</sup>	TÜV <sup>3)</sup>
Test report no.	13-U-367/SD	15-U-265/SD	15-U-266/SD	11-UW/Wels-EX-249

1. Only available in Great Britain!

2. Detailed information on the fuel is included in the operating instructions, in the section on "Permitted fuels"

3. TÜV Austria Services GmbH, Geschäftsbereich Umweltschutz, Am Thalbach 15, A-4600 Thalheim/Wels

4. As per EN 303-5, Section 5.1.3 type test: for a boiler from a range with a consistent structure it is sufficient, if the ratio of rated heat output from the largest to the smallest boiler  $\leq 2 : 1$ , to carry out the tests with the smallest and the largest boilers. The boiler manufacturer must ensure that all boilers, including those that have not been tested in the range, whose values have been determined depending on the rated heat output by interpolation, fulfil the requirements of the norm

5. Values for the types TX 200 are interpolated between the types TX 150 and TX 250, test protocol 10-UW/Wels-EX-119 and 11-UW/Wels-EX-249!

Test data wood chips - Emissions in [mg/MJ] (RL / PL)					
Carbon monoxide (CO)	mg/MJ	5 / 32	6 / 32	6 / 31	7 / 30
Nitrous oxide (NOx)	mg/MJ	73 / 60	73 / 60	71 / 59	69 / 58
Organic hydrocarbons (OGC)	mg/MJ	<1 / <2	<1 / <2	<1 / <2	<1 / <2
Dust	mg/MJ	20 / 17	20 / 17	19 / 18	17 / 19
Boiler efficiency	%	93,0 / 92,6	93,0 / 92,6	93,3 / 92,7	93,7 / 92,8

Test data wood chips - Emissions in [mg/m <sup>3</sup> ] <sup>1)</sup> (RL / PL)					
Carbon monoxide (CO)	mg/m <sup>3</sup>	8 / 48	8 / 48	9 / 46	10 / 44
Nitrous oxide (NOx)	mg/m <sup>3</sup>	107 / 89	107 / 89	105 / 87	101 / 85
Organic hydrocarbons (OGC)	mg/m <sup>3</sup>	<1 / <2	<1 / <2	<1 / <2	<1 / <2
Dust	mg/m <sup>3</sup>	29 / 25	29 / 25	27 / 27	25 / 28
Boiler efficiency	%	93,0 / 92,6	93,0 / 92,6	93,3 / 92,7	93,7 / 92,8

1. Emissions values based on dry flue gas at standard temperature and pressure (0°C, 1013 mbar) with a volume content of oxygen of 13%

Test data pellets - Emissions in [mg/MJ] (RL / PL)					
Carbon monoxide (CO)	mg/MJ	5 / 11	5 / 11	<5 / 9	4 / 6
Nitrogen oxide (NOx)	mg/MJ	67 / 58	67 / 58	69 / 58	70 / 58
Organic hydrocarbons (OGC)	mg/MJ	<2 / <2	<2 / <2	<2 / <2	<2 / <2
Dust	mg/MJ	17 / 11	17 / 11	14 / 10	11 / 9
Boiler efficiency	%	92,3 / 92,6	92,3 / 92,6	92,8 / 92,4	93,5 / 92,0

Test data pellets - Emissions in [mg/m <sup>3</sup> ] <sup>1)</sup> (RL / PL)					
Carbon monoxide (CO)	mg/m <sup>3</sup>	8 / 15	7 / 15	7 / 12	6 / 8
Nitrogen oxide (NOx)	mg/m <sup>3</sup>	99 / 85	99 / 85	101 / 86	103 / 86
Organic hydrocarbons (OGC)	mg/m <sup>3</sup>	<2 / <2	<2 / <2	<2 / <2	<2 / <2
Dust	mg/m <sup>3</sup>	24 / 17	24 / 17	20 / 15	15 / 13
Boiler efficiency	%	92,3 / 92,6	92,3 / 92,6	92,8 / 92,4	93,5 / 92,0

1. Emissions values are based on dry flue gas at standard temperature and pressure (0°C, 1013 mbar) with a volume content of oxygen of 13%

## 4 Assembly

### 4.1 Transport



#### NOTICE

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

- Follow the transport instructions on the packaging
- Transport components with care to avoid damage
- Protect components against damp
- Unloading, positioning and installation should only be performed by trained professionals! Staff must be trained in techniques for moving heavy loads (correct tools and lifting equipment, hooking and slinging points, etc.)

### 4.2 Positioning

- Attach a cable winch or similar lifting device to the eyelets on the boiler

### 4.3 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!

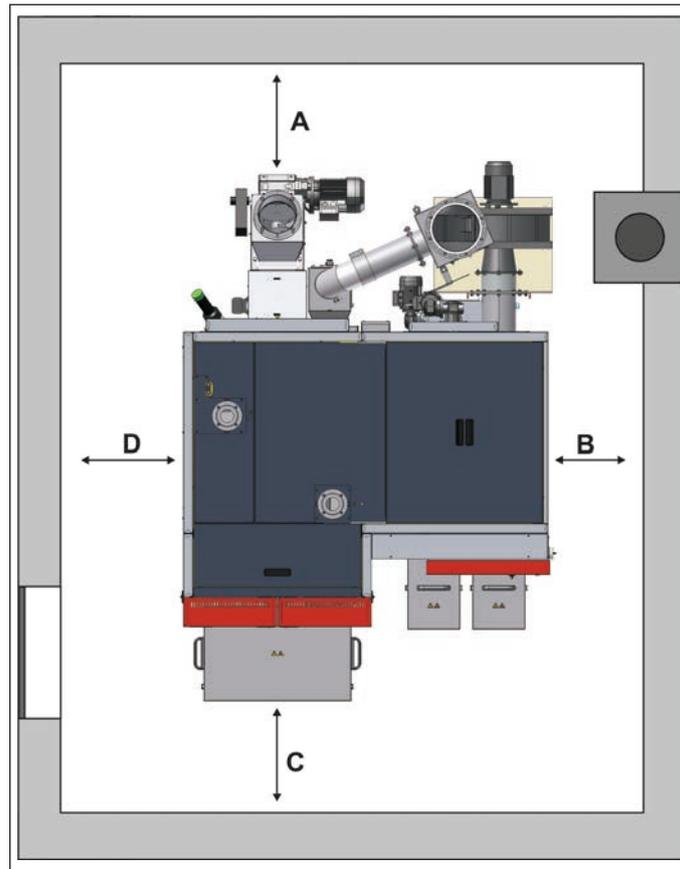
### 4.4 Set-up in the boiler room

#### 4.4.1 Moving the boiler in the boiler room

- Position a fork-lift or similar lifting device with a suitable load-bearing capacity at the base frame
- Lift and transport to the intended position in the installation room
  - Observe the minimum distances in the boiler room.

### 4.4.2 Minimum distances in the boiler room

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



Pos.	Description	Unit	TX 200 - 250
A	Space requirement for inspection area of infeed	mm	400
B	Distance from heat exchanger side to wall		300
C	Space requirement for removal of ash box		400
D	Space requirement for inspection area of retort		400

## 4.5 Mounting steps

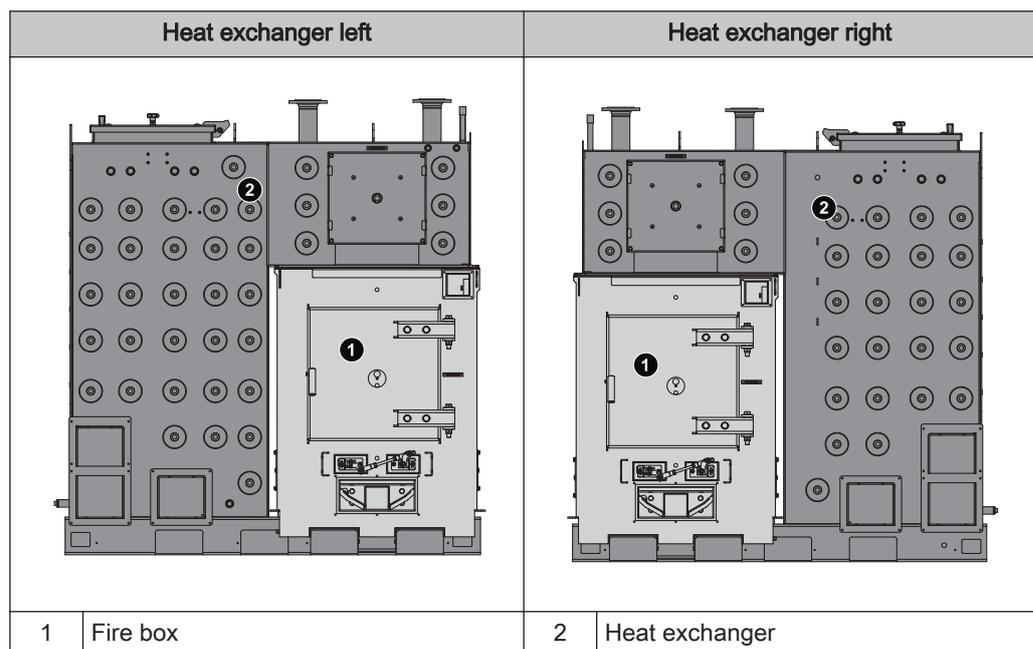
### 4.5.1 General information

#### *Boiler front side and boiler back side*

The front side is considered as operator side of the boiler. All for operation necessary elements like combustion chamber door, ash box and control box are arranged on the front side. The back side is the opposite side. On the back side the stoker unit, the WOS-drive as well as the whole exhaust gas routing system are arranged.

#### *Heat exchanger left or right*

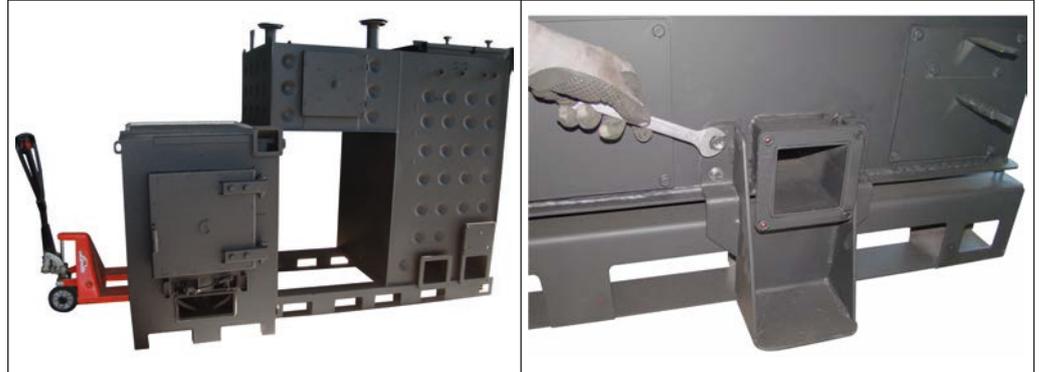
In general it is different, if the heat exchanger of the TX (front view = operator side) is positioned on the left or the right side of the fire box. Before mounting it has to be defined, whether the heat exchanger is mounted on the left or the right, as far as it is not defined by an existing floor plan.



The following illustrations of mounting steps show the heat exchanger on the right side. If the heat exchanger is arranged on the left side, the mounting steps have to be applied laterally reversed by analogy.

### 4.5.2 Screwing the fire box with the heat exchanger

#### *Positioning of the fire box from the side*



- Insert the lift truck at the fire box opposite and lift it up as far as the fire box can be positioned without colliding with the heat exchanger
- Bring in the fire box completely at the side of the heat exchanger and lower it slowly
- Remove the supporting post on the ash flange of the fire box

#### *Positioning the fire box from the front*

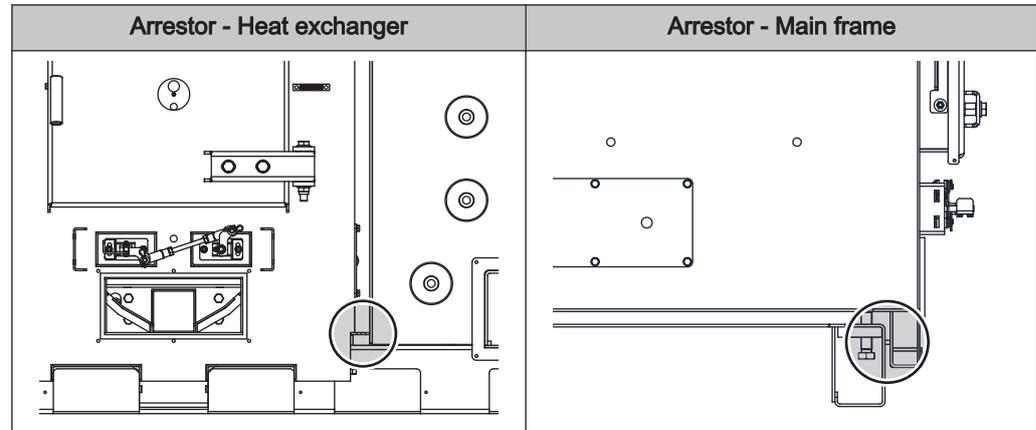
If there is not enough space to bring in the fire box from the side, it is possible to bring it in from the front:



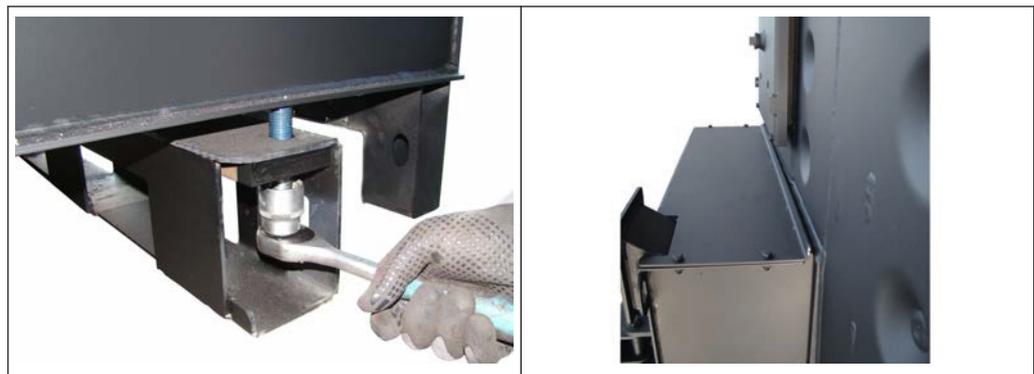
- Insert the lift truck at the fire box opposite the supporting post
- Place a piece of pipe, square timber or similar with a height of approx. 75 mm below the fire box as a distance piece
- Lift the fire box with the lifting truck and remove the supporting post on the ash flange
- Position the loading arm of the lift truck by the openings of the main frame and insert the fire box as far as the distance piece can be positioned within the apron
- Lower the fire box, position the distance piece within the apron, lift the fire box once again and bring it completely in.

**Adjust and fix the fire box**

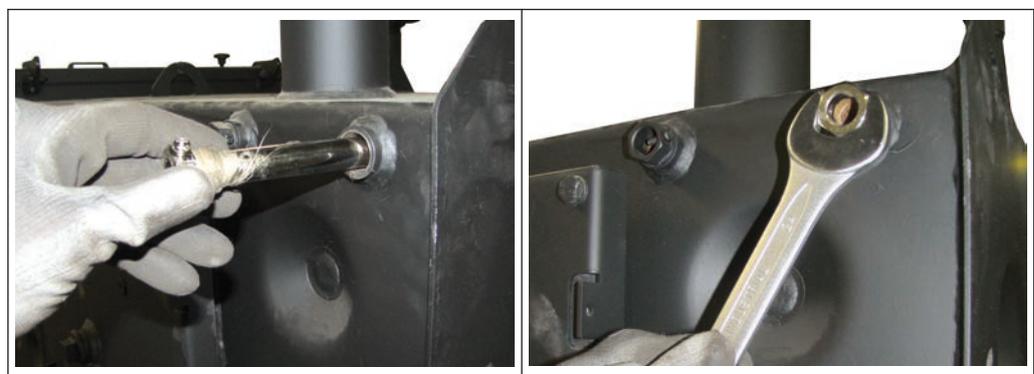
Before fixing, the fire box has to be adjusted in the heat exchanger. Two arrestors have to be attended.



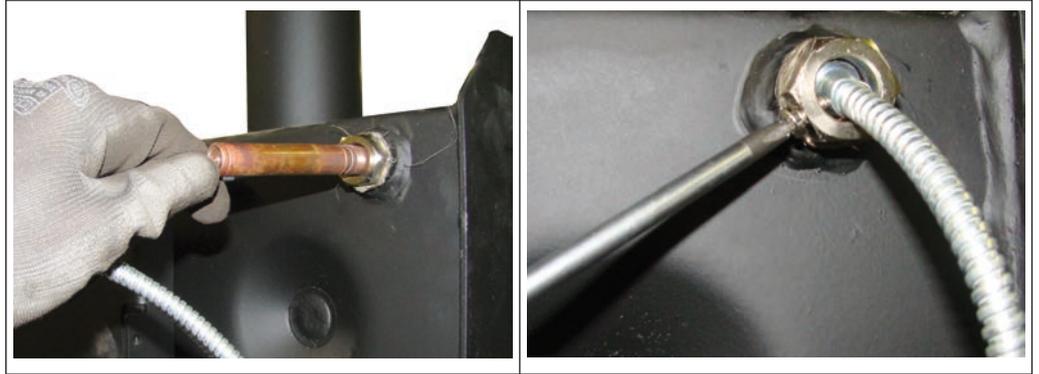
After positioning of the fire box in the heat exchanger:



- Tighten the fire box against the heat exchanger with carrying bolts through the lateral cutouts in the main frame
  - Check that the fire box is aligned with the heat exchanger and pay attention on seal cord, it shall have a constant closing!

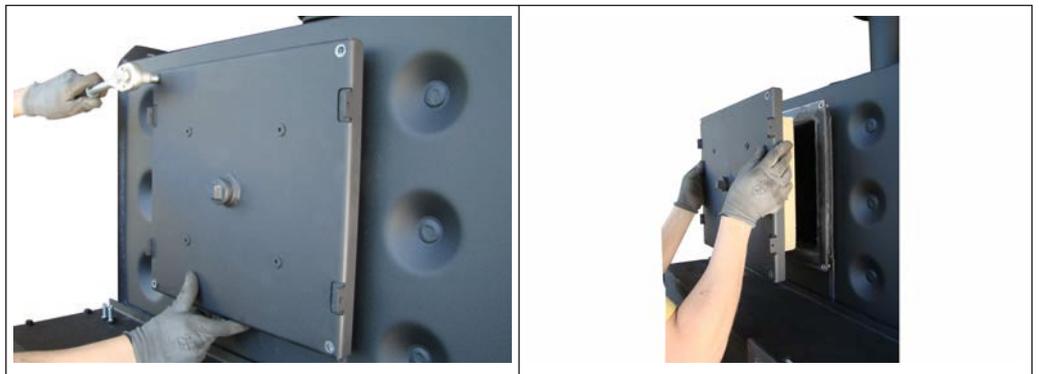
**4.5.3 Installing sensor of thermal discharge system**

- Remove blind plug at the heat exchanger
- Use both thread tape and pipe dope and screw in thermowell



- Insert sensor of the thermal discharge system at thermowell
- Insert protective tube of the sensor and tighten the fixing screw gently

#### 4.5.4 Assembly of fireclay blocks



- Remove bolting on the heat exchanger cover
- Remove the heat exchanger cover



- Place ceramic fibre mats on the fire box as shown
  - Make sure that two mats are placed on the side to the heat exchanger
- Place fireclay blocks on the ceramic fibre mats as shown
  - Place the lateral capstone on the side to the heat exchanger with the grade downwards

#### 4.5.5 Preparation of flue gas recirculation connection (Option)

In case of configuration of the boiler with optional flue gas recirculation (FGR), the following preparation work has to be carried out:



- Remove the blanking plate on the fire box on the left by the infeed unit



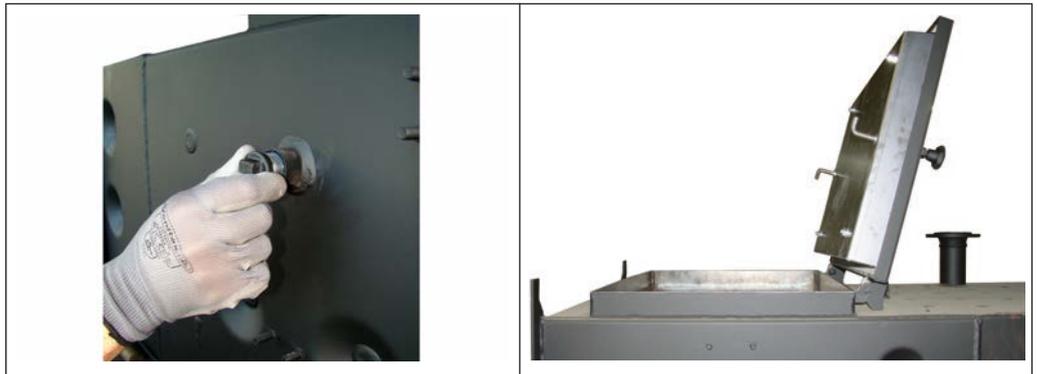
- Fix the inter-flange for flue gas recirculation connection along with seal on the boiler. Take the previously dismantled screws.
  - The central c-profile in the inter-flange has to point downwards to the boiler.
  - Press nuts have to be at the outer flange

#### 4.5.6 Retrofitting the WOS bar (if necessary)

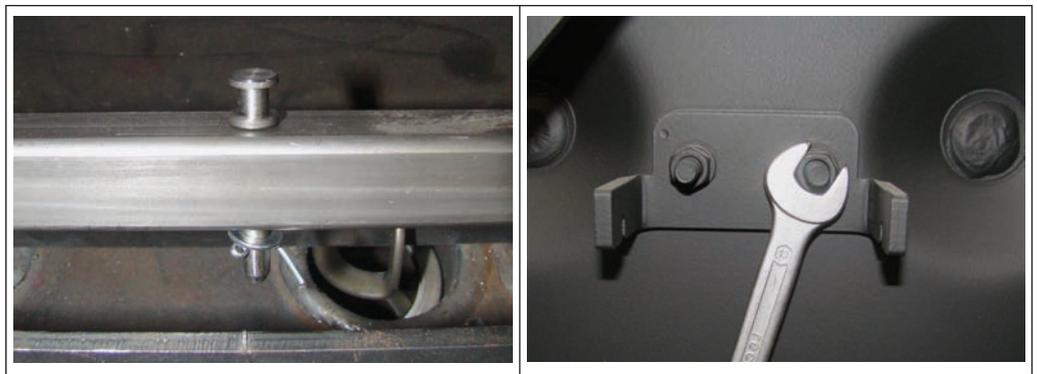
The WOS drive is always mounted on the back side of the boiler opposite to the control box. Depending on delivery condition the WOS bar has to be adjusted accordingly:



- Loosen the clamping jaw at the actuating lever and remove them from the WOS shaft
- Unscrew the bearing bush of the shaft



- Remove the blind plug on the opposite of the WOS shaft
- Loosen the screwing on the heat exchanger cover, set star grip to left-hand stop and open the cover

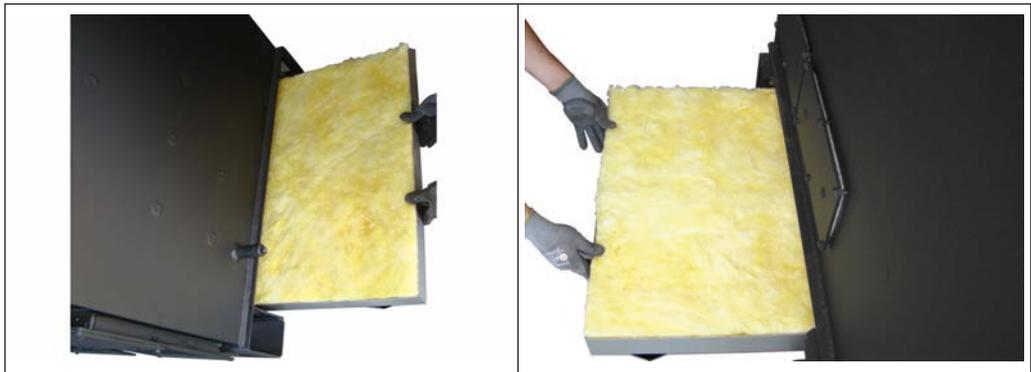


- Remove safety pin of the WOS shaft and pull out the shaft
- Fit in the WOS shaft from the opposite and pull it through
- Remount the prior removed bearing bush and blind plug on the opposite side
- Remove the tension hook and remount it on the opposite as well

## 4.5.7 Installing lower main frame of insulation

## NOTICE

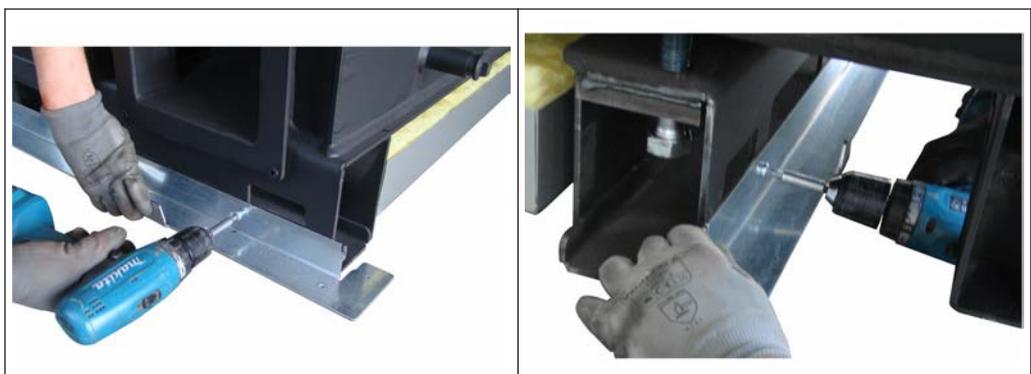
The individual parts of the boiler insulation covered with a protective film. You must remove the protective film before proceeding with installation.



- Insert each bottom insulation below fire box and heat exchanger



- Place longitudinal and cross elements of the bottom main frame of the insulation on the floor

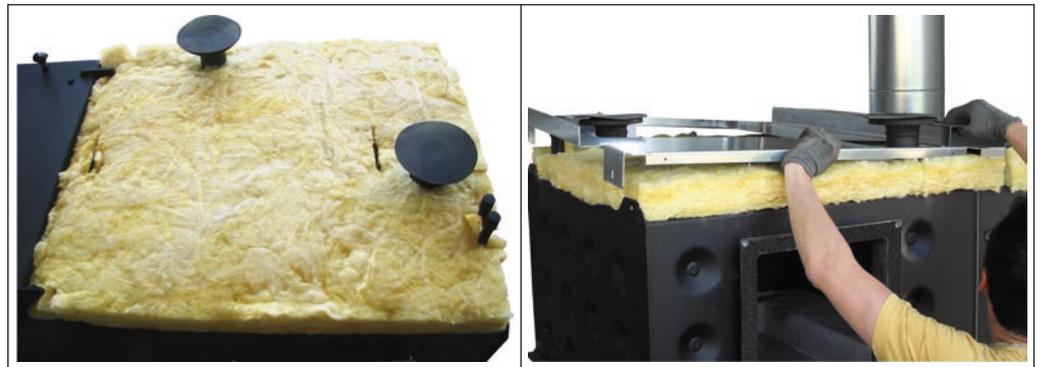


- Fix longitudinal elements at intended positions on the front and the back of the boiler

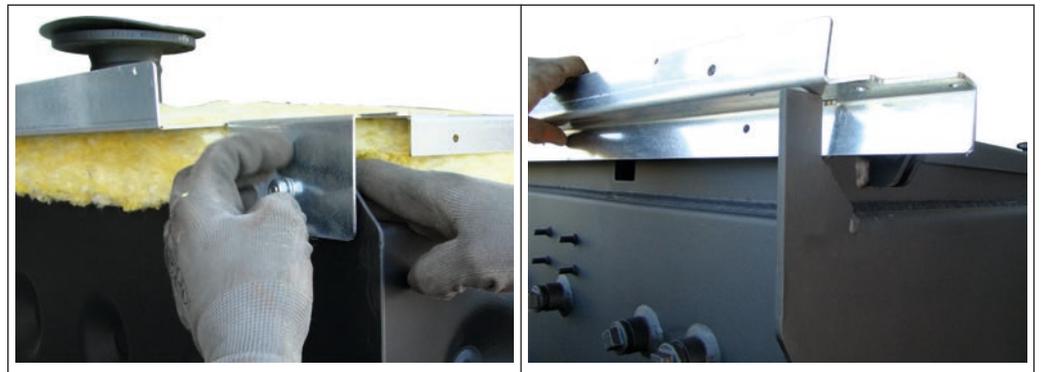


- Place cross elements on longitudinal elements and bolt it together at the angles

#### 4.5.8 Installing upper main frame of insulation



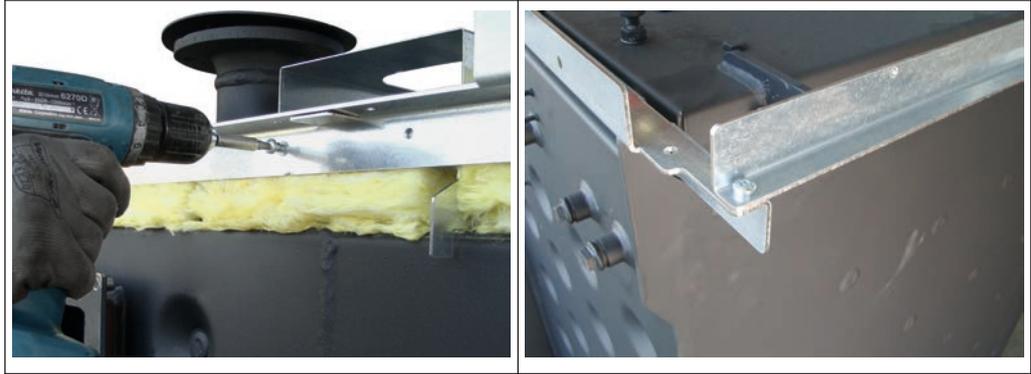
- Place the heat insulation mat as shown on the boiler and position the cable routing above



- Screw the cable routing to the boiler laterally
- Place longitudinal elements on the front and the back of the boiler



- When putting on make sure that the lug of the cable routing threads into the frame



- Fix longitudinal elements to the boiler laterally
- At the heat exchanger side, place cross elements on longitudinal elements and bolt it together at the corners

#### 4.5.9 Installing the frame for the insulating door

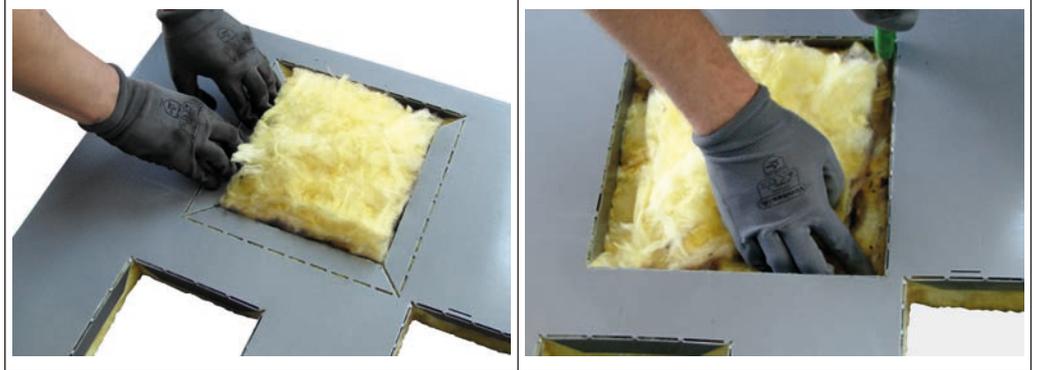


- Place frame element for insulating door on the front
- Screw the frame element together with the upper and lower longitudinal element

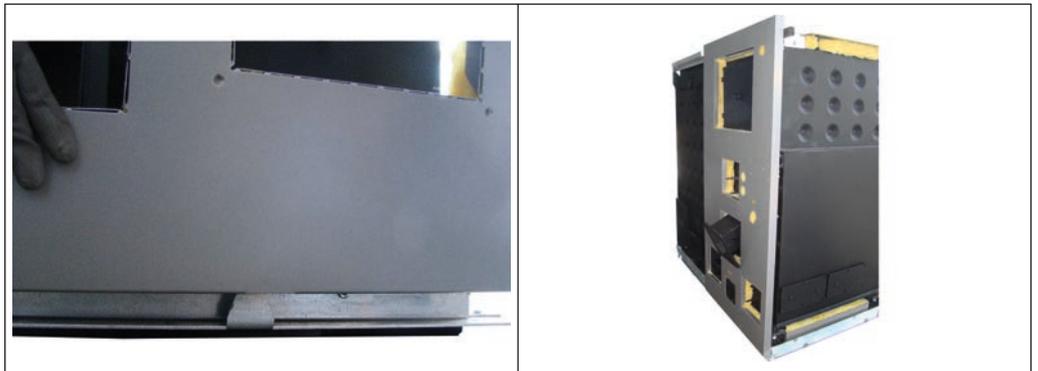


- Insert insulation on the left and the right of the combustion chamber door

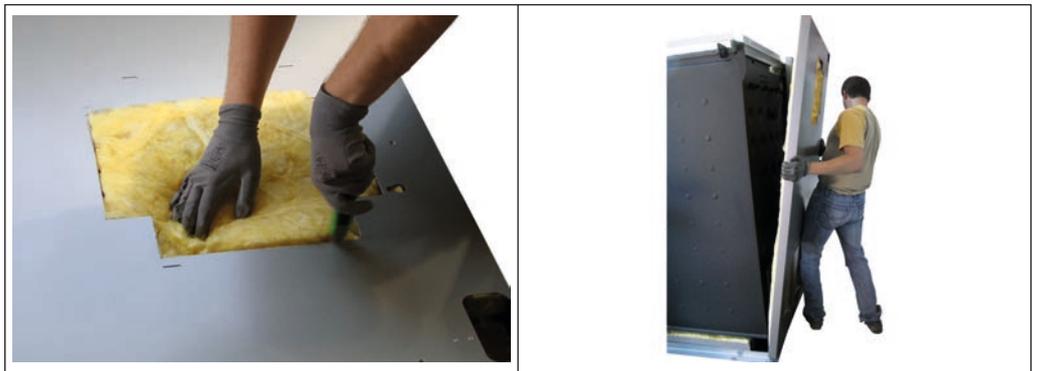
#### 4.5.10 Installing the insulating side panels



- When applying the optional FGR separate the pre-cut recess at the back insulating side panel of the retort
- Bend the lugs of the pre-cut recess at right angles inwards
- Cut the insulation with a cutter along the edge and remove it



- Suspend the back insulating side panel at the upper and lower frame elements
  - Ensure correct threading into the lugs of the lower longitudinal element



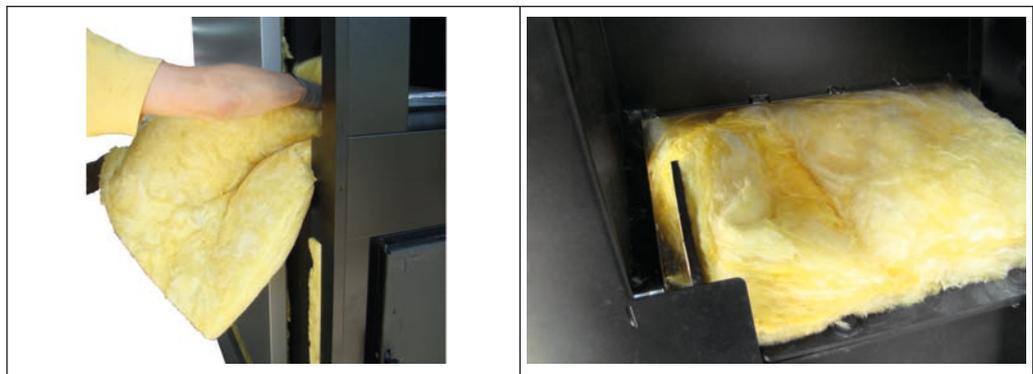
- Separate the pre-cut recess for the WOS drive at the back insulating side panel of the heat exchanger
- Cut the underlying insulation with a cutter along the edge and remove it
- Suspend the back insulating side panel for the heat exchanger at the upper and lower frame elements



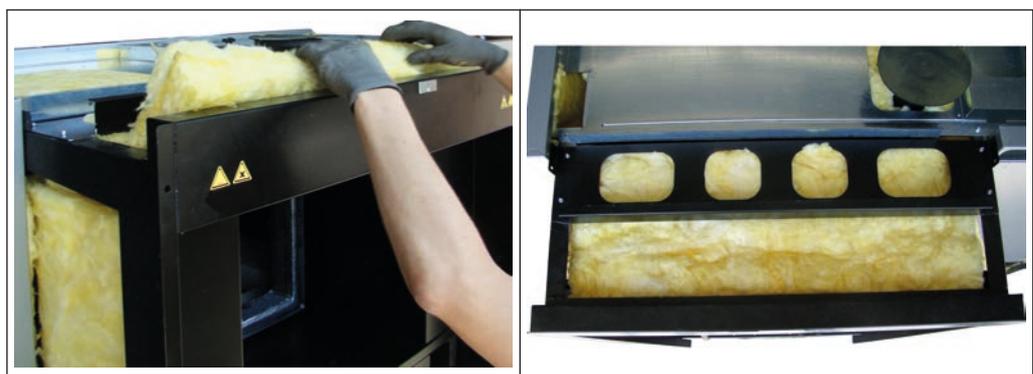
- Suspend the front and lateral insulating side panel of the heat exchanger



- Suspend the opposite lateral insulating side panel
- Coat spaces with heat insulation mats lateral of the heat exchanger cover



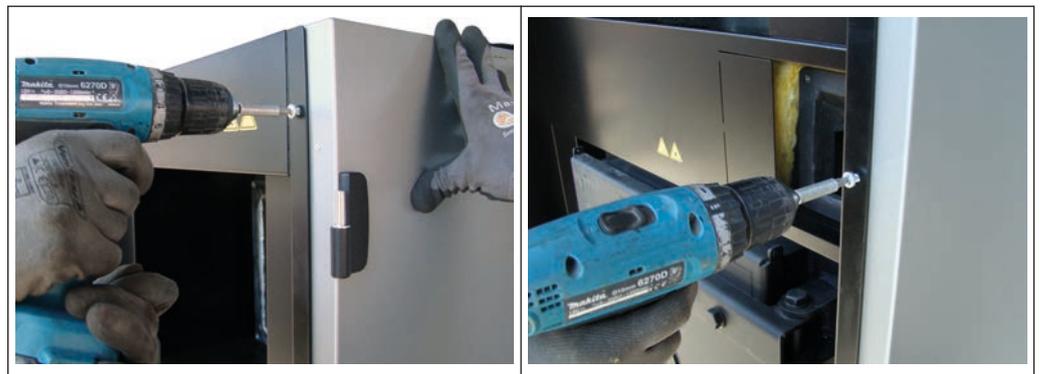
- TX 250: Mount an additional insulation mat at the frame above the fire box



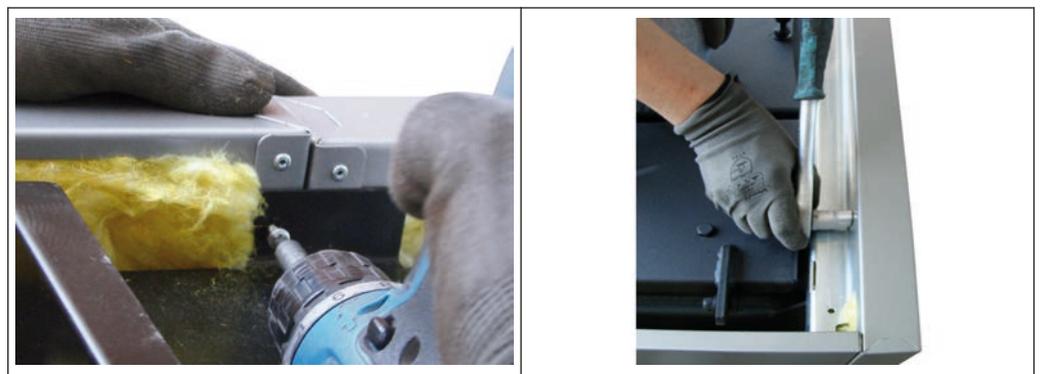
- Place the heat insulation mat at the upper range of the frame



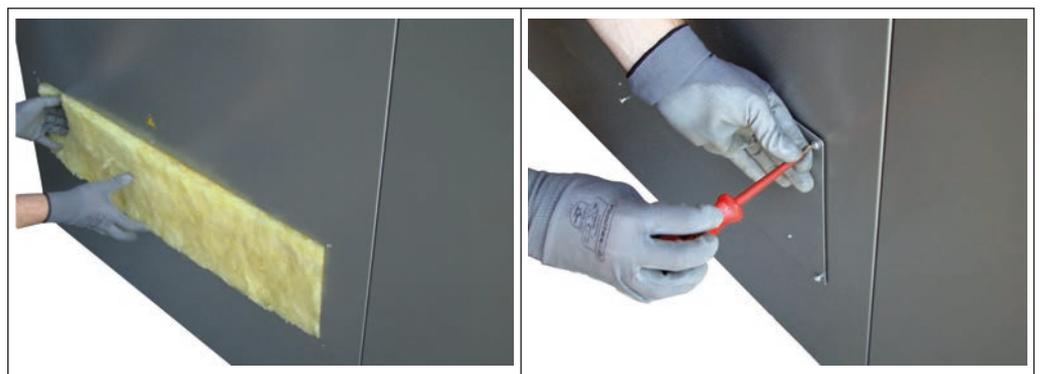
- ☐ Position the lateral insulating side panels with door hinge left and right at the frame



- ☐ Fix the side panels at the frame using 4 thread forming screws



- ☐ Screw all insulating side panels with elements of the main frame together

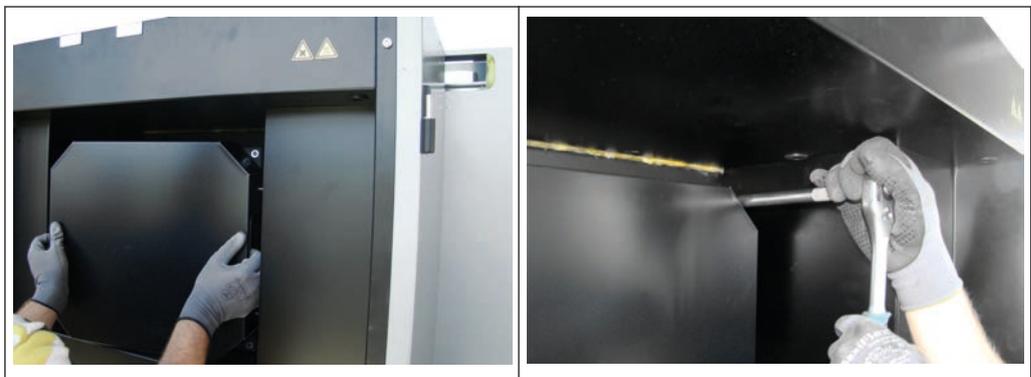


- ☐ Cover the inspection opening of the retort with insulation
- ☐ Mount inspection cover at the insulating side panel

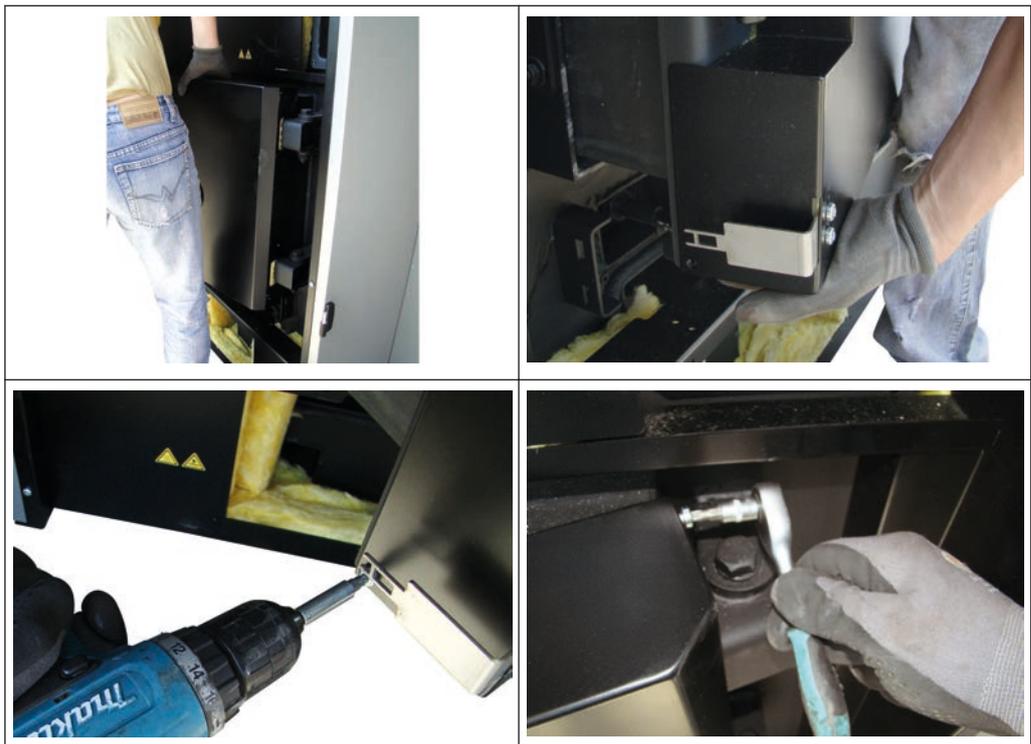
## 4.5.11 Complete the heat exchanger cover and the combustion chamber door



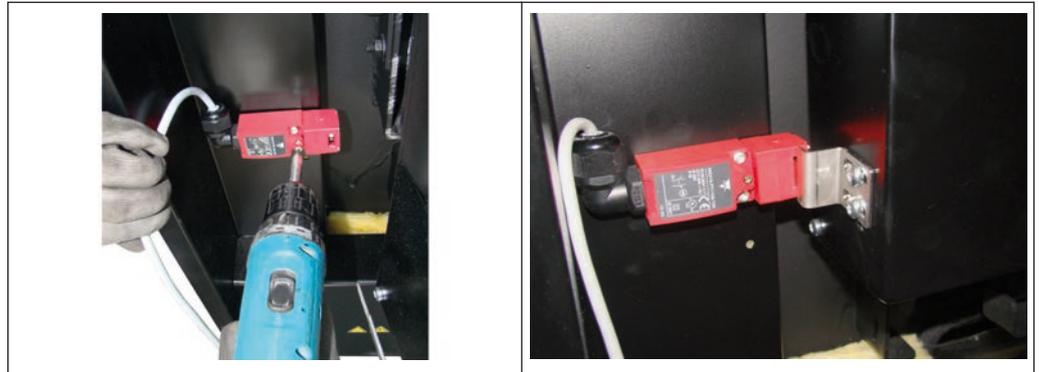
- Position the cover plate at the heat exchanger cover
- Fix the cover plate using 4 thread forming screws



- Mount the heat exchanger cover at the heat exchanger



- ❑ Position the cover plate at the combustion chamber door and fix it on the left and on the right with thread forming screws

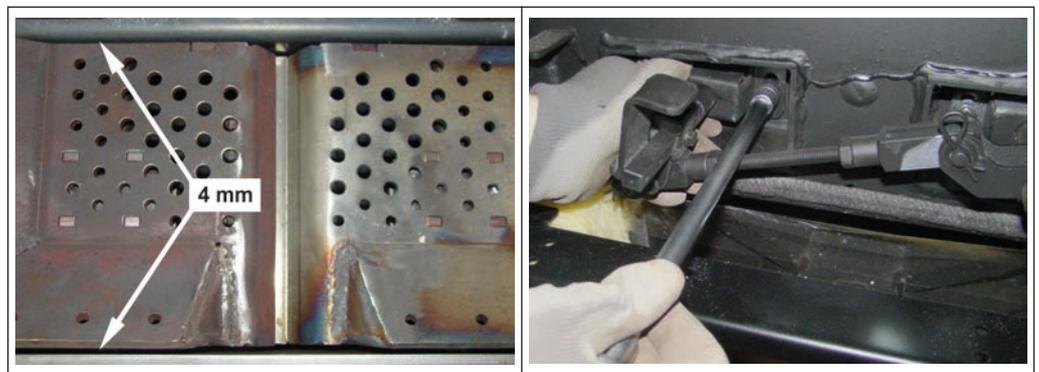


- ❑ Mount safety limit switch at the frame element
- ❑ Loosen screwings at the key plate
- ❑ Close the combustion chamber door and adjust the key plate so that an unproblematic locking at the safety limit switch is possible
- ❑ Fix the positioning of the key plate and check the correct locking at the limit switch when opening and closing the combustion chamber door for several times

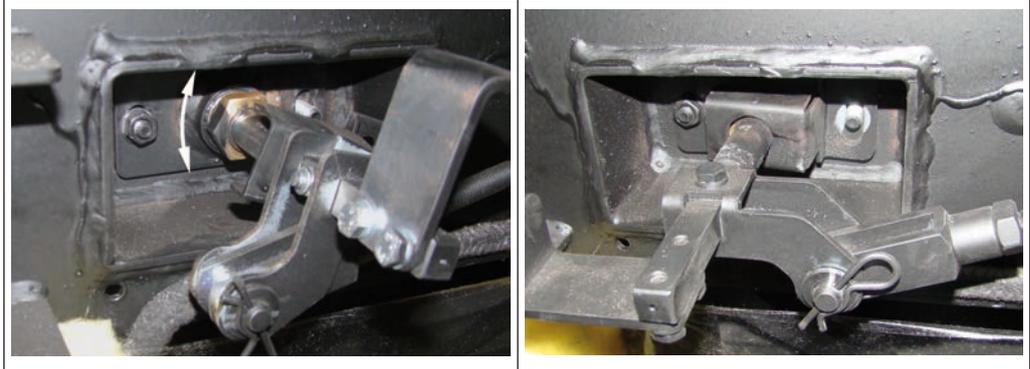


- ❑ Lay the connection cable of the safety limit switch upwards through the upper opening of the frame element

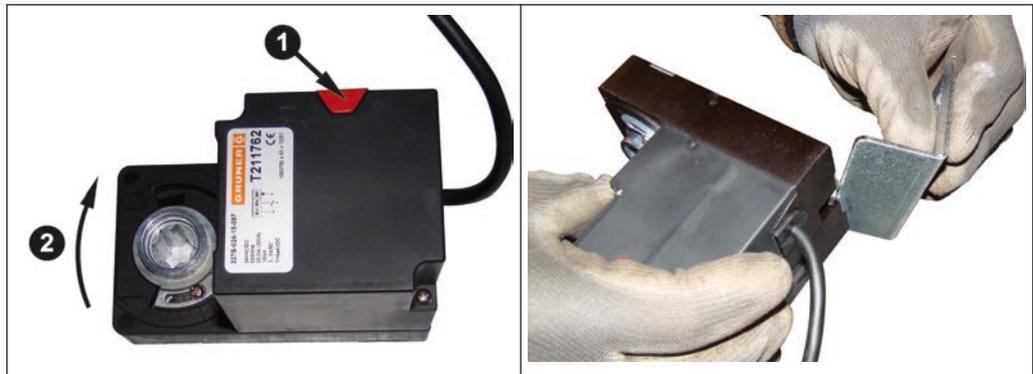
#### 4.5.12 Check grate settings and install the tipping grate motor



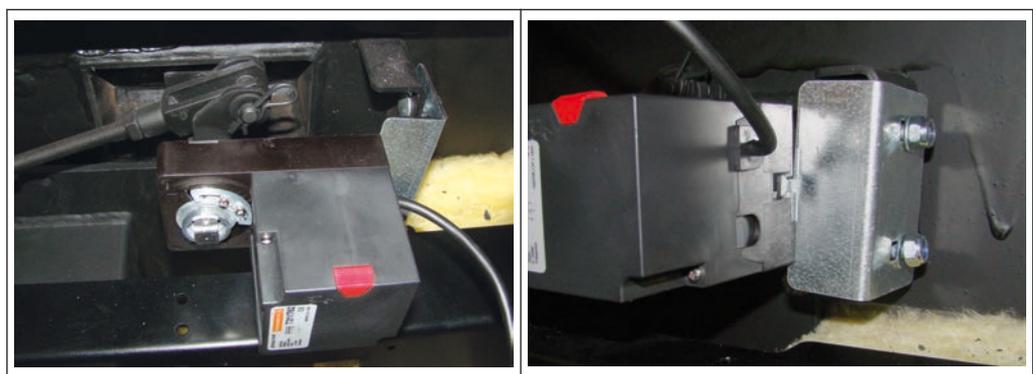
- ❑ Open the combustion chamber door and check front and rear separation in the fire box
  - ➔ Min. separation: 4mm (0.16 inch)!
- ❑ For corrections of the grate settings dismount the safety plate at the grate shaft



- Position the grate by screwing the shaft bearing
- Fix the position of the shaft bearing by mounting the safety plate



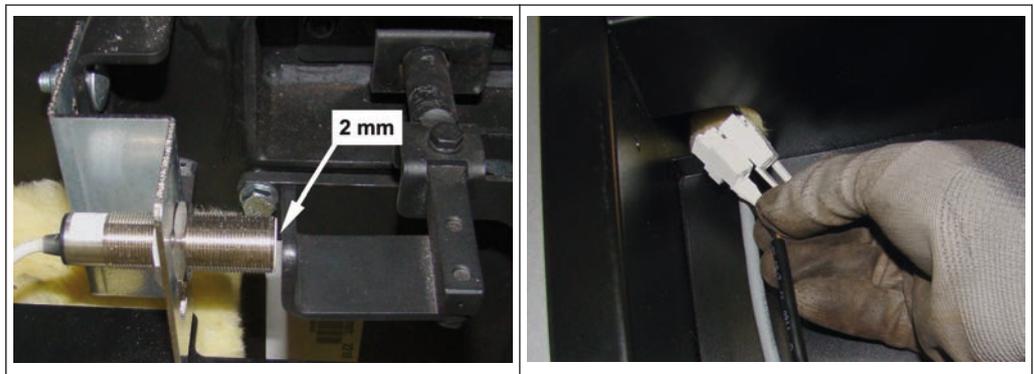
- Bring grate to closed position
- Press the release knob at the actuator and set the shaft support to the right-hand stop while pressing the release knob
- Mount the torque arm at the actuator



- Put the actuator together with the torque arm on the right grate shaft
- Fix the torque arm with 2 round-head screws M8x20, lining disks M8 and lock nuts M8 at the fire box

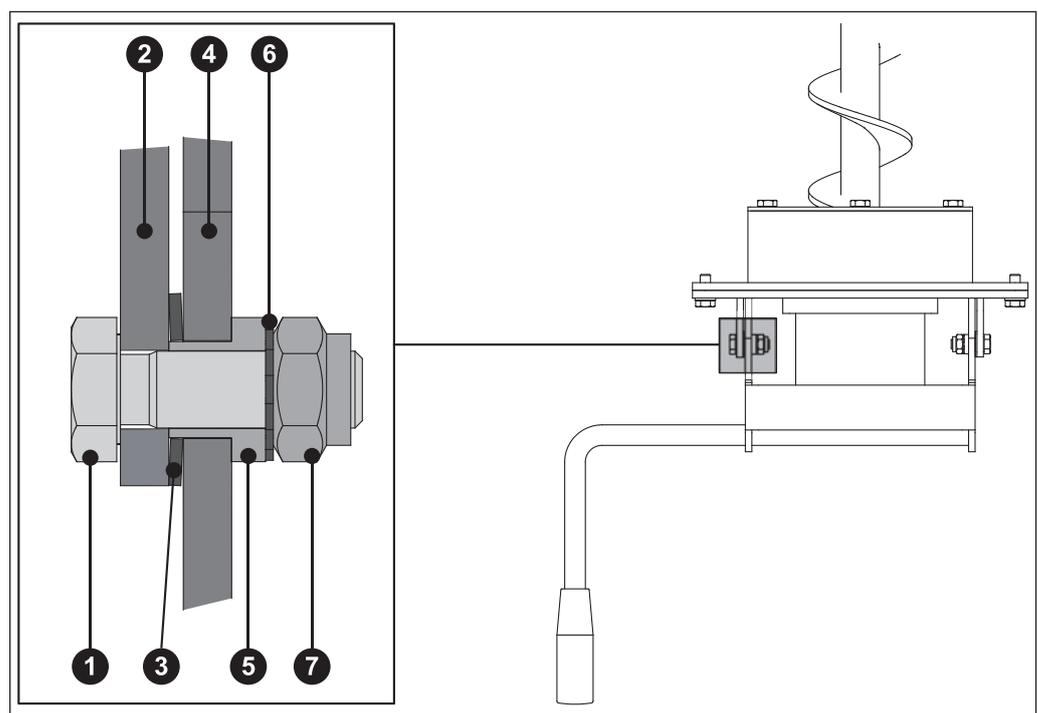


- Fix the sensor mounting at the side of the left grate shaft with 2 round-head screws M8x20, lining disks M8 and lock nuts M8 at the fire box
- Thread the proximity sensor at the mounting and fix it easily with pre-installed nuts

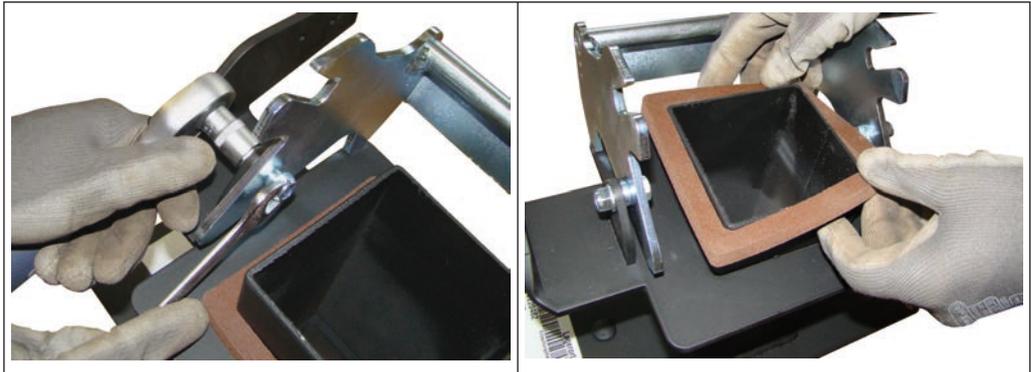


- Fix the sensor with approx. 1-2 mm (0.04-0.08 inch) separation
- Lay the connection cable of the sensor and the actuator on the left side upwards and lead it through the upper opening at the frame element

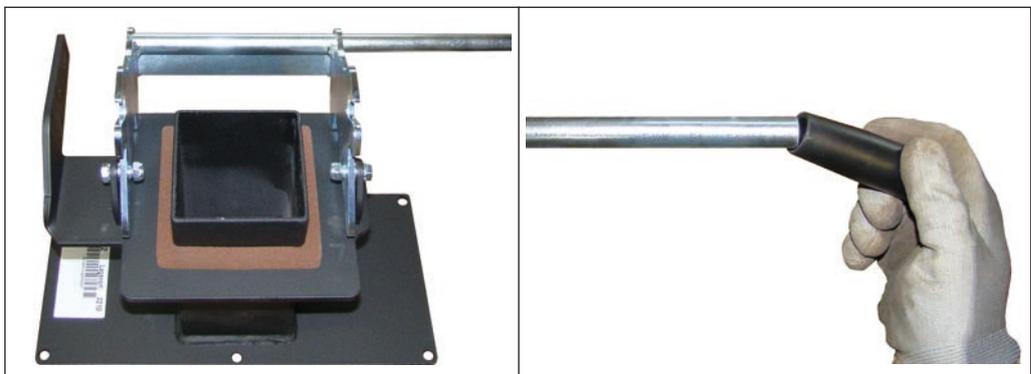
#### 4.5.13 Installing the fire box ash removal unit



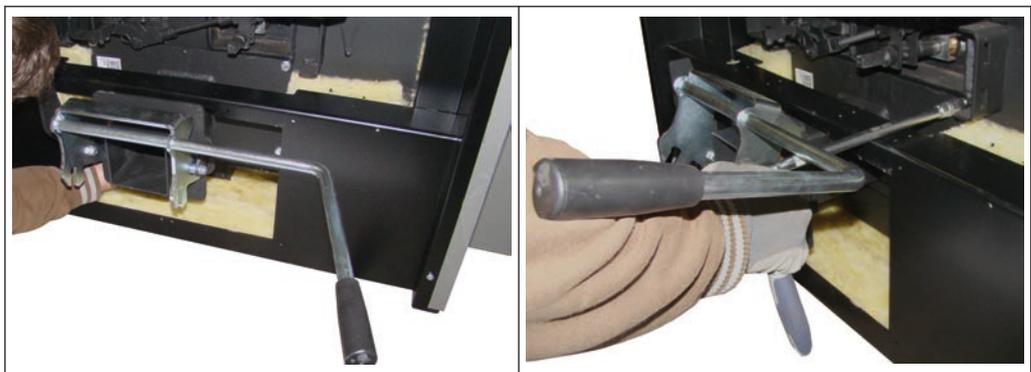
1	Hexagonal bolt M8x25	2	Ash removal flange
3	Plate washer	4	Locking lever
5	Bearing bush	6	Chopper disk M8
7	Lock nut M8		



- Mount the locking lever at the ash removal flange as seen in the illustration above
- Put the rubber seal over the channel of the ash removal flange



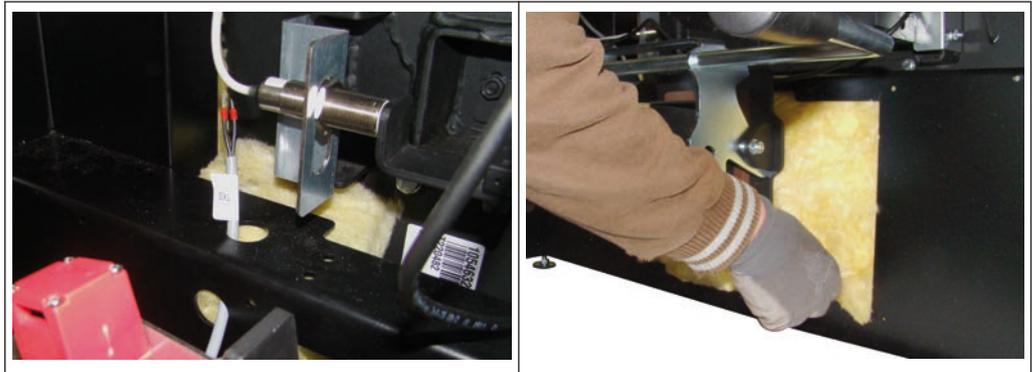
- Put the plastic handle on the locking lever
  - Use a rubber mallet



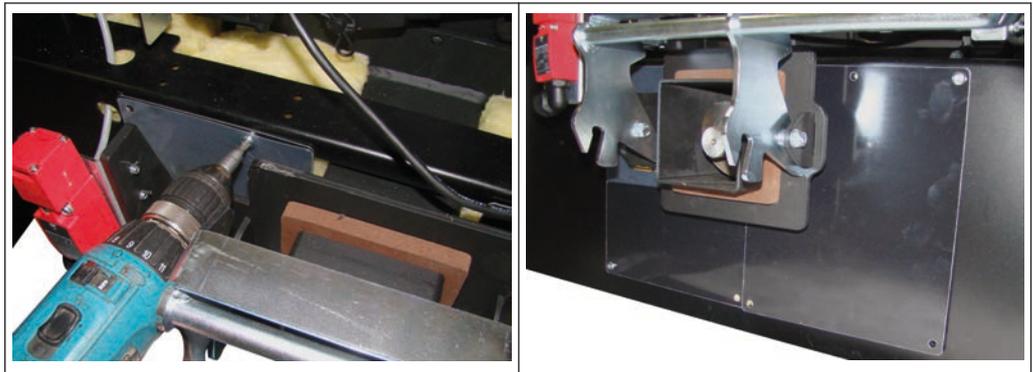
- Slip the assembled ash removal flange on the fire box and fix it with 6 hexagon bolts M8x25 and lining disks M8



- Mount the angle plate with 2 thread forming screws at the lug of the ash removal flange
- Mount the safety limit switch with each 2 fillisters M4x30, lining disks M4 and hexagonal nuts M4
  - ➔ Do not fasten screwing yet



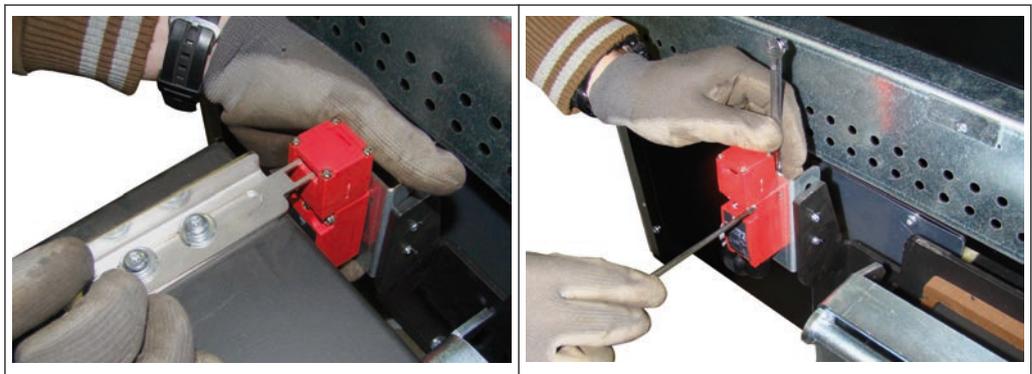
- Thread the cable of the safety limit switch through both cuttings at the frame element, lay them on the left side upwards and thread them through at the upper opening of the frame element
- Put two heat insulation mats on the ash flange



- Fix the cover plates on the left and the right of the ash removal flange with thread forming screws



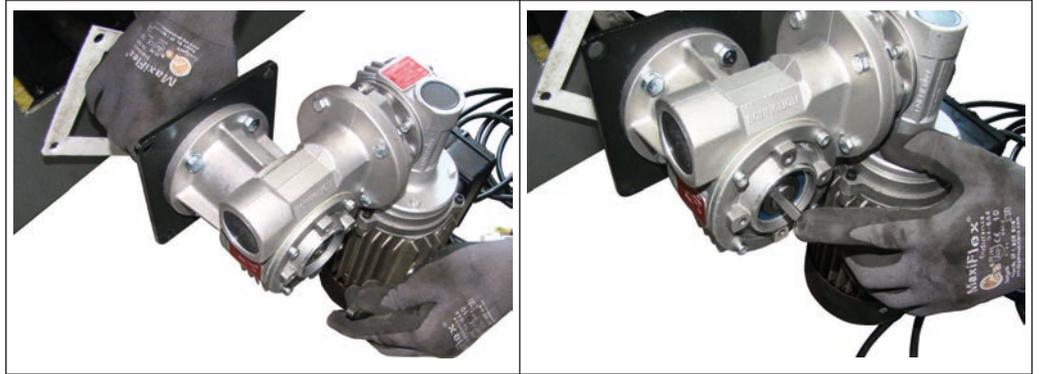
- Insert the protection plate above the leverage of the tipping device and fix it with thread forming screws at the fire box
- Put the ash box onto the ash removal flange and lock it



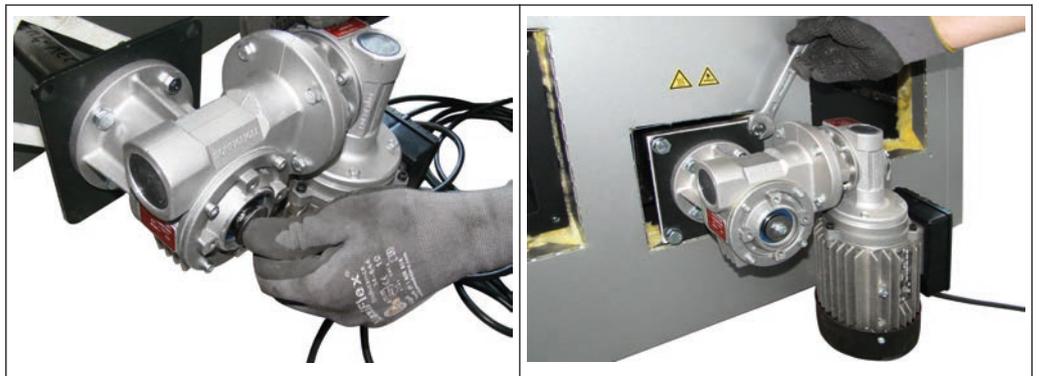
- Place the safety limit switch so that the key plate can easily be threaded to the switch
- Fix the position of the safety limit switch by fastening the screwings at the angle plat and limit switch



- Mount the gear motor with 4 hexagonal bolts on the flange plate
- Put the ash screw onto the back side of the boiler
- Dismount the shaft circlip (big hexagonal bolt and lining disk) and the key at the end of the shaft



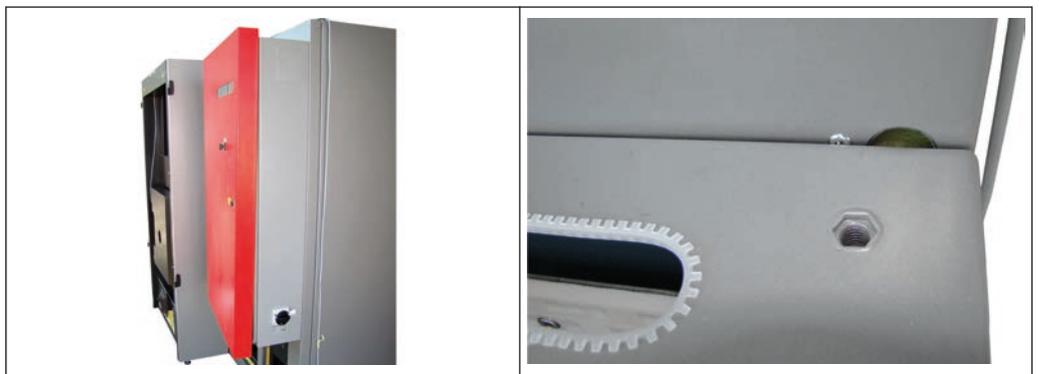
- Put the ceramic fibre seal and the gear motor onto the screw
- Slide the shaft entirely into the gear drive and rotate it until the key at the shaft aligns with the key at the gear drive, afterwards insert the fitting key



- Screw the previously removed shaft circlip onto the shaft
- Push the entire unit in and screw it with 4 hexagonal bolts M8x20 and lining disks M8 at the flange of the fire box

#### 4.5.14 Installing the switch cabinet and cable ducts

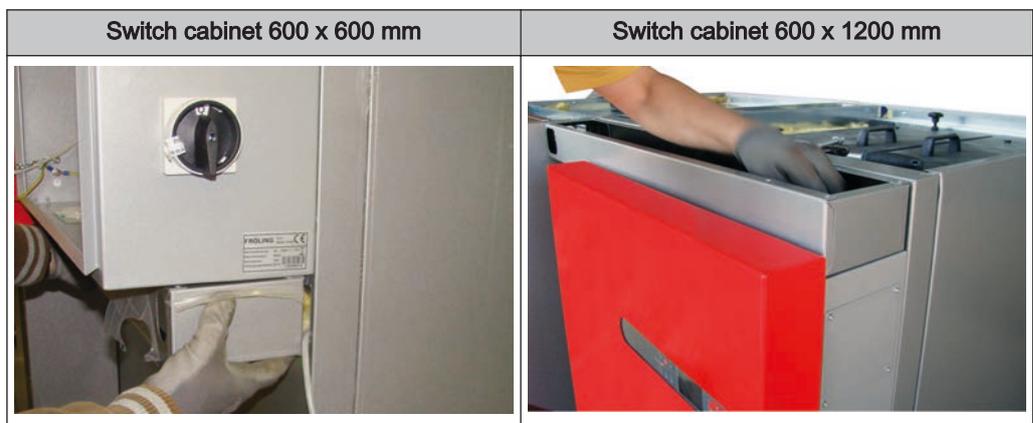
Depending on the design two different sizes of switch cabinets are available (600x600 mm / 600x1200 mm). The following illustrations show the bigger switch cabinet (TX200-250 standard delivery contents).



- Mount the switch cabinet at the heat exchanger front on the insulating side panel by using the included studs (flat headed screws included to the switch cabinet)



- Open the switch cabinet door and fix the switch cabinet at each corner on the insulating side panel



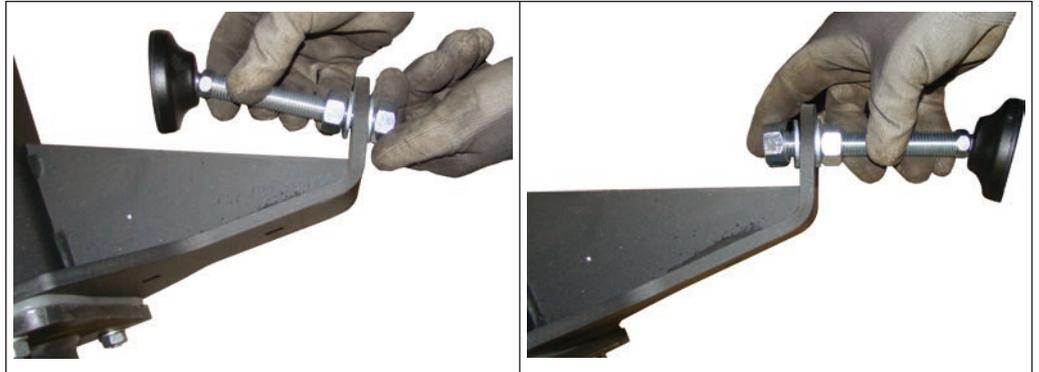
- Place the switch cabinet duct below respectively above (depending on the switch cabinet size)



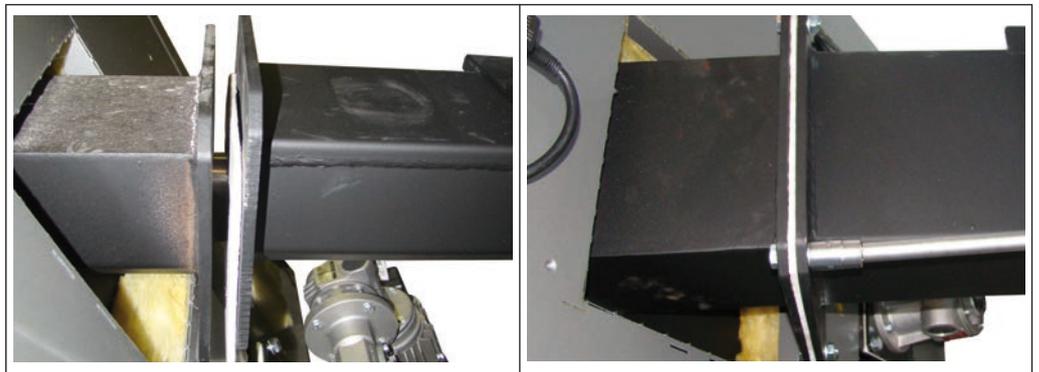
- Fix the switch cabinet duct with hexagonal bolts M8, lining disks M8 and nuts M8 at the switch cabinet

- Screw the cable duct on the back with the insulating side panel
  - Mount cable so that the cable bushing corresponds with the one of the insulating side panel

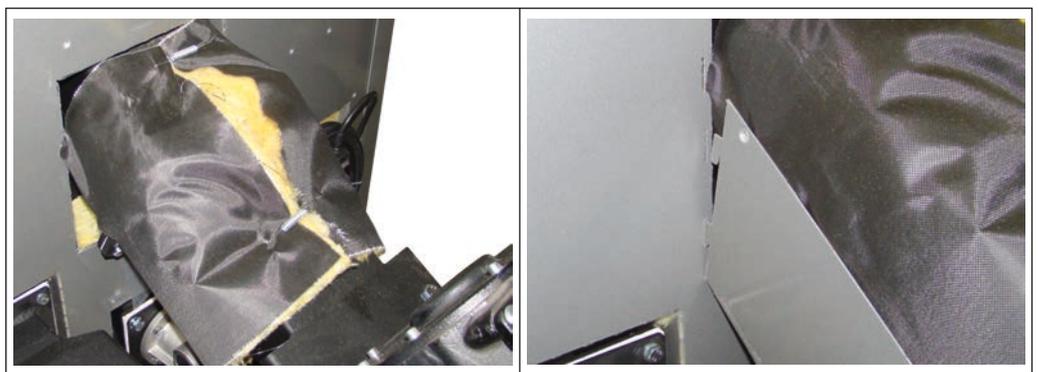
#### 4.5.15 Installing the stoker unit



- Remove the pre-installed adjustable foot
- Turn round the adjustable foot and remount it
  - Do not fasten the screwing yet



- Place the stoker unit at the plug-in flange and lay in the ceramic fibre seal
- Screw it with each 4 hexagonal bolts M10x35, washers M10 and hexagonal nuts M10 to the plug-in flange
- Tighten the entire stoker unit incl. adjustable foot and fasten the screwing at the adjustable foot

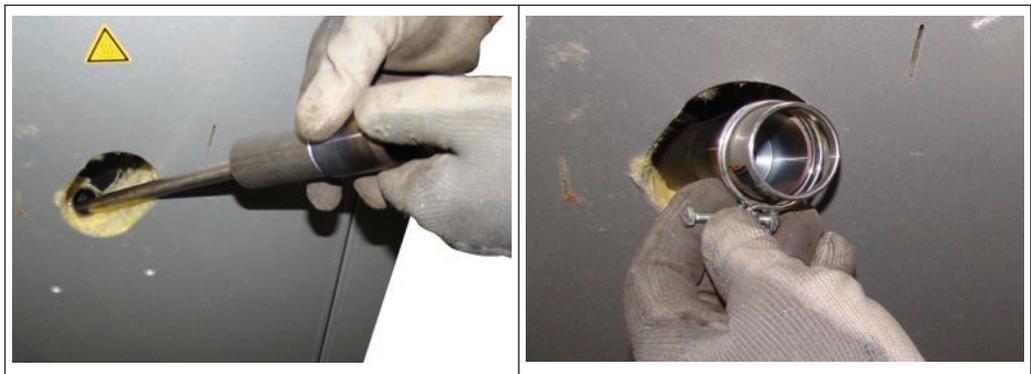


- Wrap the heat insulation mat around the stoker channel and fix the tension spring
- Hook the lower cover plate with the adapter onto the insulating side panel

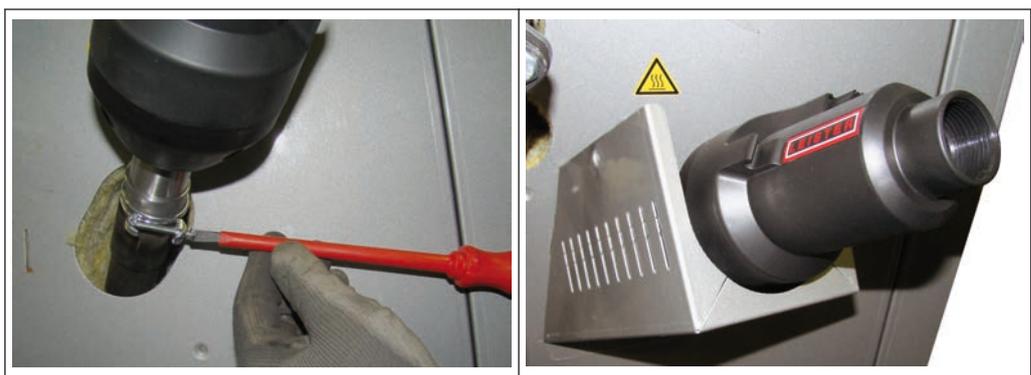


- Hook onto the top cover plate and screw it together with the insulating side panel and the lower cover plate

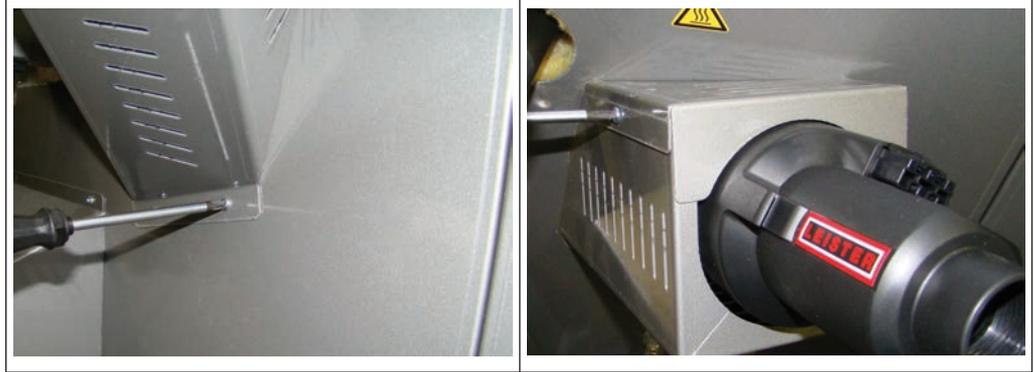
#### 4.5.16 Installing the automatic igniter



- Screw in the ignitor pipe
- Put the double wire spring clamp over the ignitor pipe



- Put the igniter into the ignitor pipe and fix it with a double wire spring clamp
  - Tighten the clamp gently to avoid damages
- Hook the base part of the cover with the adapter onto the insulating side panel



- Fix the base part of the cover on the underside with sheet metal screws
- Put onto the top of the cover and fix it with sheet metal screws at the side of the base part

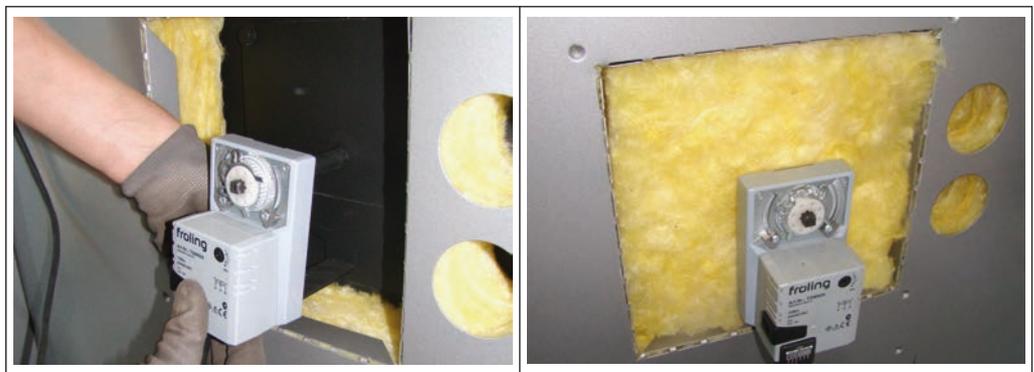
#### 4.5.17 Installing the actuators of the air flaps

Before installing the actuators:

- Set air flap with a nipper to left-hand stop
- Press the release knob at the actuator and set the shaft support to the left-hand stop while pressing the release knob

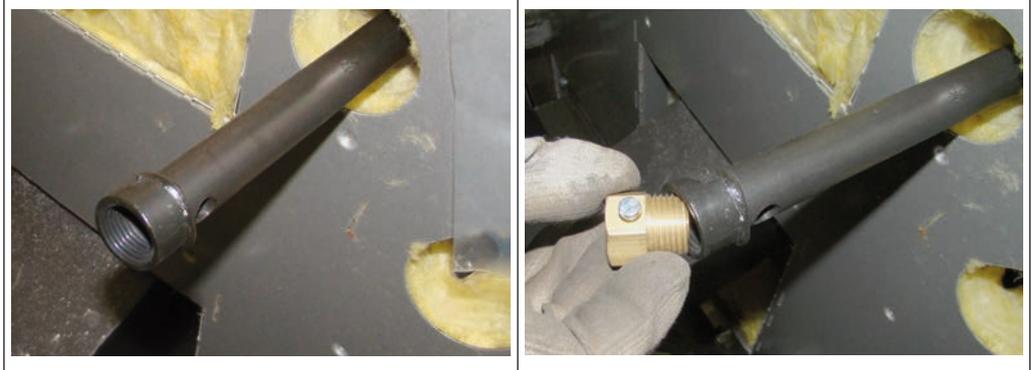


- Put on the actuator for primary air to the right of the stoker unit as illustrated
  - Connection cable points upwards
- Fill the opening with an heat insulation mat



- Put on the actuator for secondary air above the stoker unit as illustrated
  - Connection cable points upwards
- Fill the opening with an heat insulation mat

## 4.5.18 Installing overpressure monitor and temperature sensor



- Screw in the extension socket above the stoker unit
- Screw in a brass bushing at the extension socket



- Insert the overpressure monitor and tighten the locating screw gently
- Screw in the flange pipe of the combustion chamber temperature sensor above the overpressure sensor



- Loosen the clamp screw at the mating flange
- Insert the temperature sensor and fasten the flange bolting



- Insert the temperature sensor until it extends approx. 30 - 50 mm (1 - 2 inch) into the combustion chamber and fix this position with clamp screws
- Remove the cover of the junction box and connect the balancing line
  - green wire at the clamp with the green mark
  - white wire at the unmarked clamp

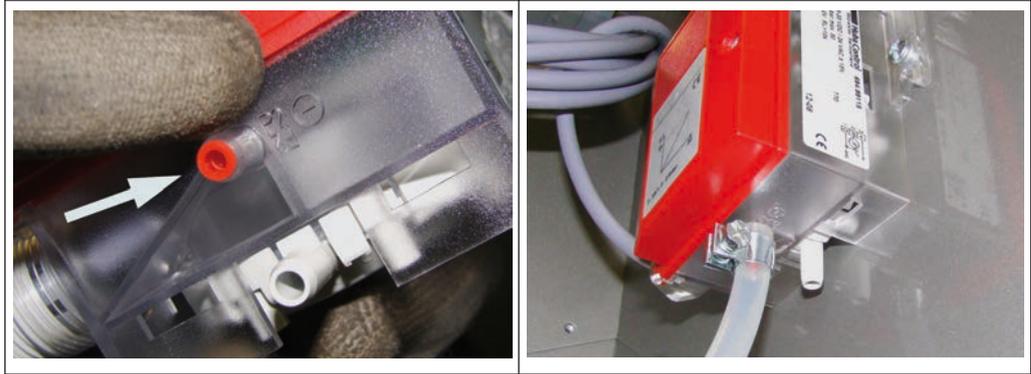
#### 4.5.19 Installing the underpressure measurement



- Assemble the double nipple, the reducing socket and the hose nipple as illustrated
- Screw in the entire unit right beside the stoker



- Fix the underpressure sensor cartridge with 2 sheet metal screws at the insulating side panel
- Put the hose clamp onto the silicone hose, put on the hose nipple and fasten the hose clamp

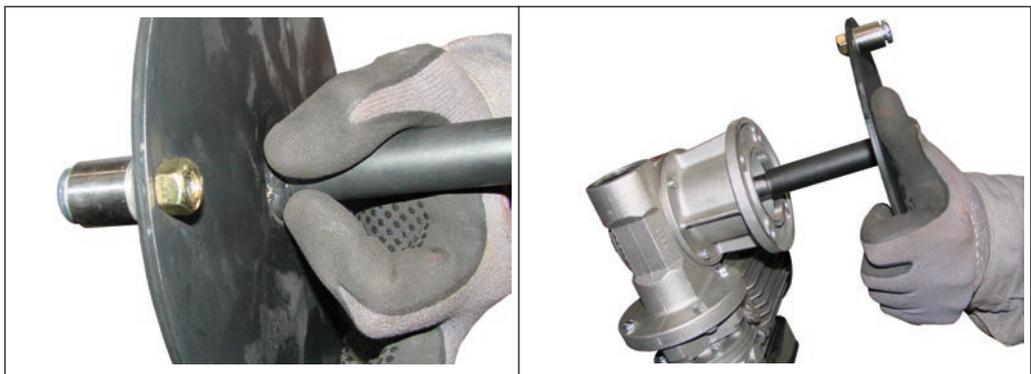


- Connect the other end of the silicone hose to the underpressure sensor cartridge at nipple '-' with a hose clamp
  - Do not remove the red reducing plug!

#### 4.5.20 Installing the WOS drive



- Put on the bracket to the stud at the heat exchanger and fix it with 4 washers M8 and lock nuts M8



- Mount shouldered bolts M8x20, bushing and lock nuts M8 at WOS disk as illustrated
- Insert WOS disk at the gear motor



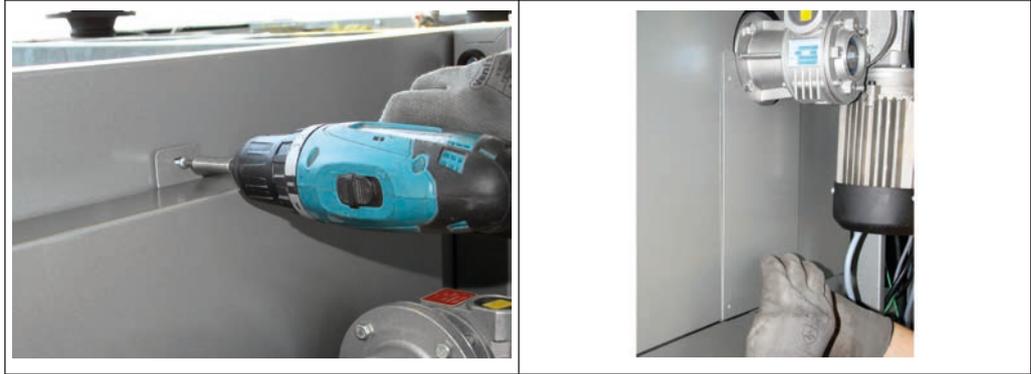
- Position the entire unit at the bracket so that the motor points downwards
- Fix the motor with 4 hexagonal bolts M8x30, washers M8 and lock nuts M8 at the bracket



- Insert the key and lock it



- Hook on the tension spring at the WOS lever, tighten it and hook it on at the lug
- Thread the WOS cover from above behind the WOS drive and hook the stud into the slots at the insulating side panel

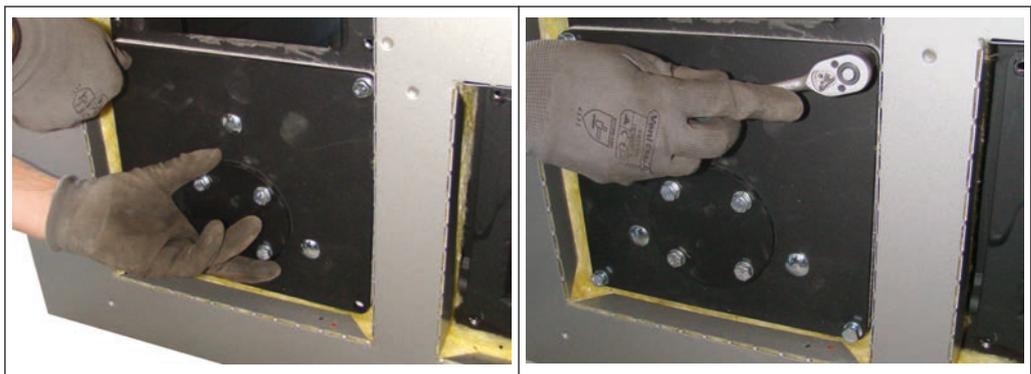


- Fix the cover at the top part with a sheet metal screw
- Fix the cover plate below the WOS drive with sheet metal screws

#### 4.5.21 Heat exchanger ash removal unit with ash box



- Put the rubber seal on the flange plate
- Set on the sealing plate and fix it with 4 hexagonal bolts M8x16 and washers M8



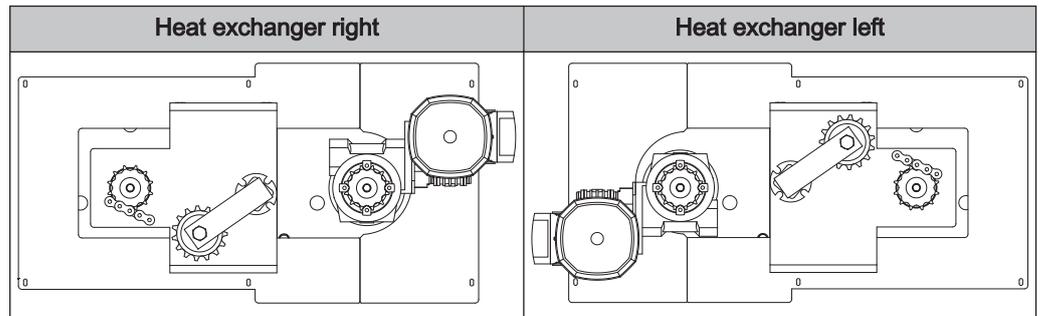
- Mount the flange plate at the back of the heat exchanger with 4 hexagonal bolts M8x20



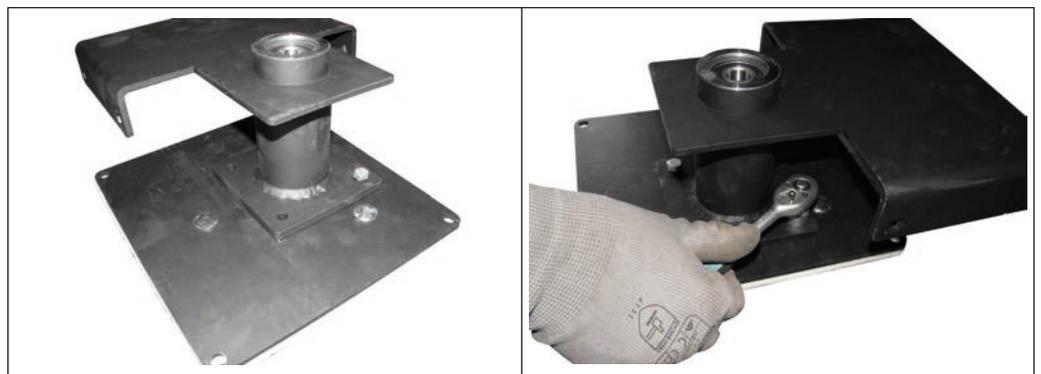
- Slide in the ash box at the front of the heat exchanger and fix it with 4 star knob screws

#### 4.5.22 Heat exchanger ash removal unit with ash screw (optional)

##### *Installing the actuator of the ash screw*



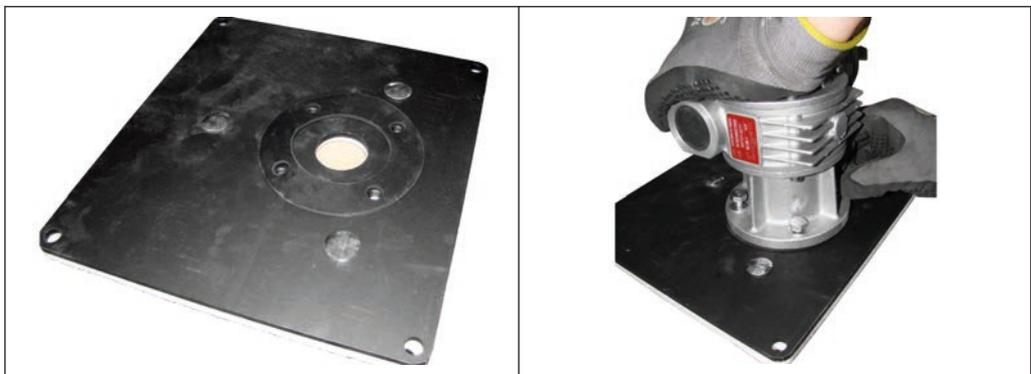
The following steps show the assembly of the automatic heat exchanger ash removal unit for boilers with the heat exchanger on the right. If the heat exchanger is on the left, the steps should be adjusted appropriately. Please note that the chain tensioner points downwards when the heat exchanger is on the right. In case of a heat exchanger on the left, the chain tensioner points upwards.



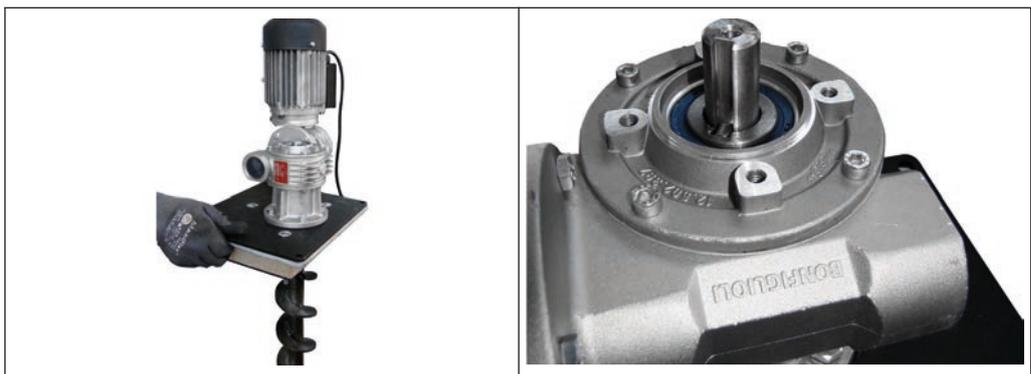
- Fix the bearing block at the flange plate with 4 hexagonal bolts M8x16 and washers M8



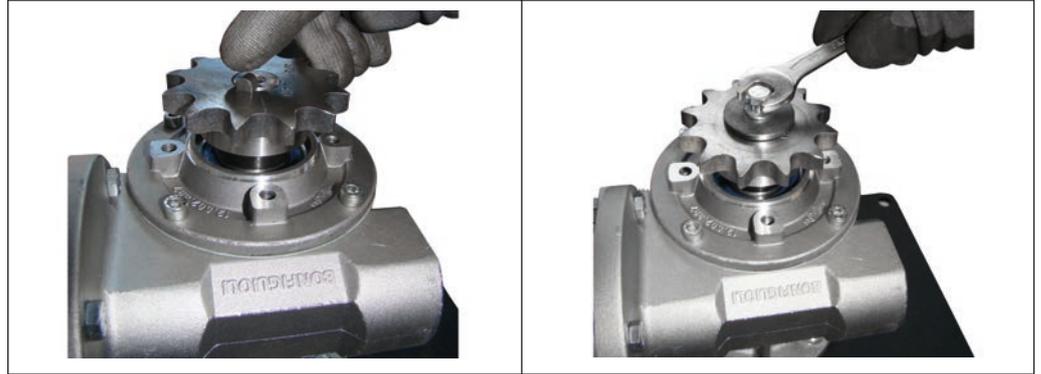
- Slide in the ash screw at the pedestal. Insert the entire unit at the back of the heat exchanger below the ID fan connection
- Fix the flange plate with 4 hexagonal bolts M8x20 and washers M8 at the heat exchanger



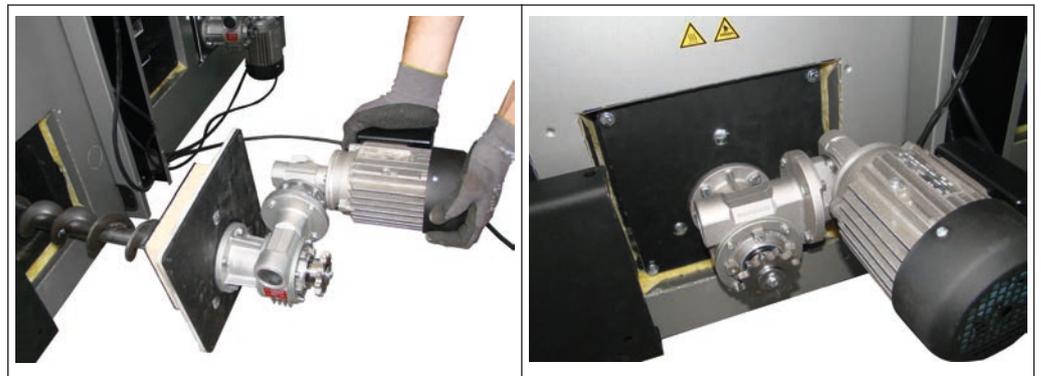
- Put the rubber seal at the second flange plate
- Put the gear motor onto and fix it with 4 hexagonal bolts M8x16



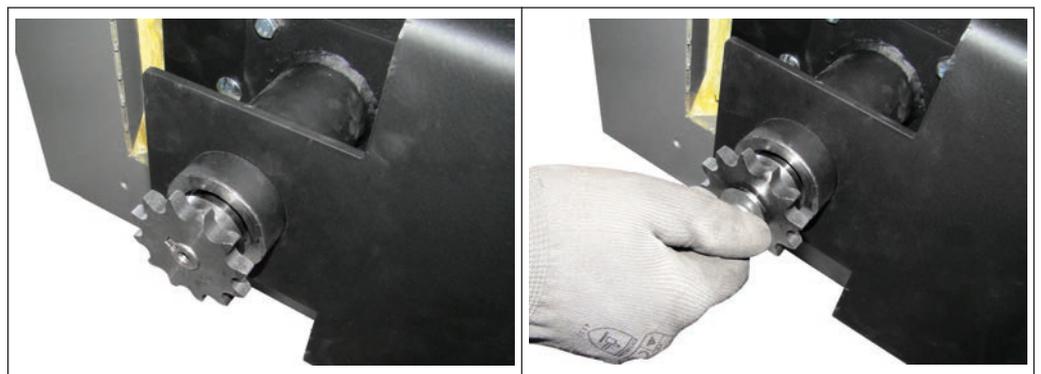
- Thread in the ash screw at the flange plate and gear motor and push it entirely through



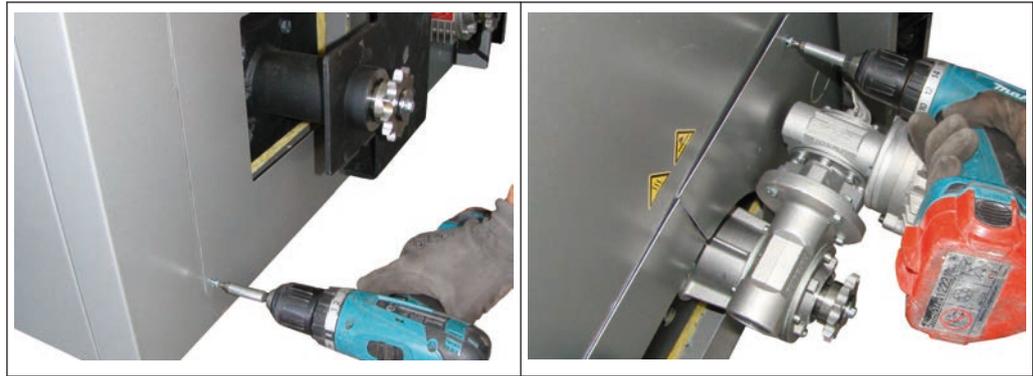
- Put on the chain wheel at the shaft of the ash screw and insert the key
- Secure the key with a washer Ø30 mm (1.18 inch), a split washer M6 and an hexagonal bolt M6x16



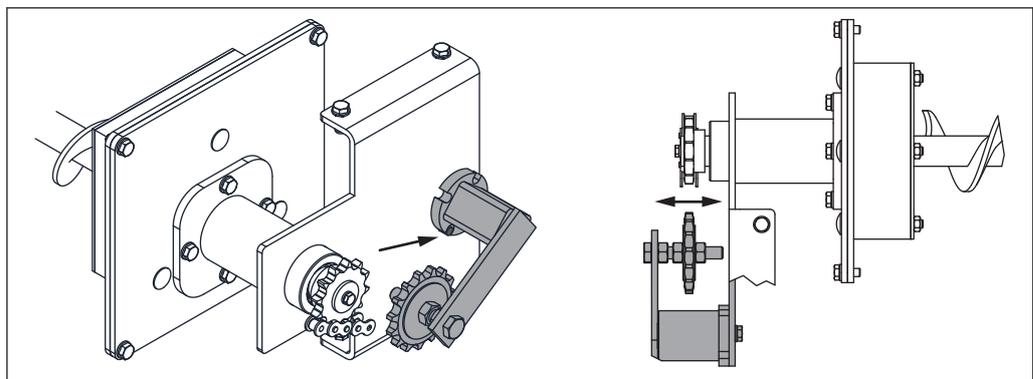
- Slide in the entire unit at the heat exchanger and fix it with each 4 hexagonal bolts M8x20 and washers M8



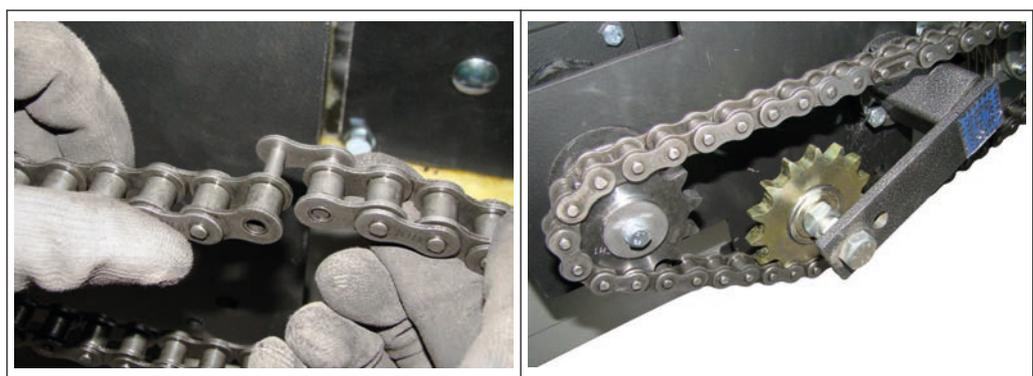
- Put on the second chain wheel at the shaft of the ash screw at the pedestal and insert the key
- Secure the key with a washer Ø30 mm (1.18 inch), a split washer M6 and an hexagonal bolt M6x16



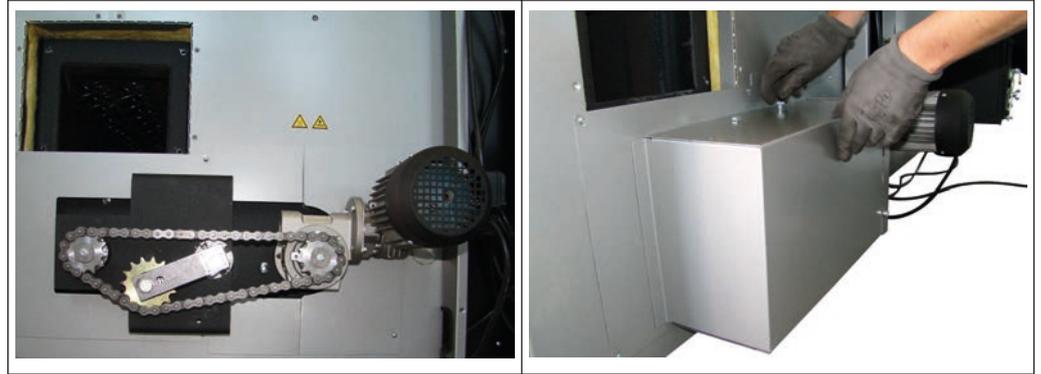
- Mount split cover plate behind the pedestal and gear motor with sheet metal screws at the insulating side panel



- Mount chain tensioner with hexagonal bolts M10x30 and split washer M10 at the pedestal
  - Engage the chain tensioner at the stud of the pedestal so that sufficient tension is generated at the chain
- Kettenrad am Kettenspanner durch Verdrehen der Sechskantmuttern so einstellen, dass alle drei Kettenräder fluchtend ausgerichtet sind

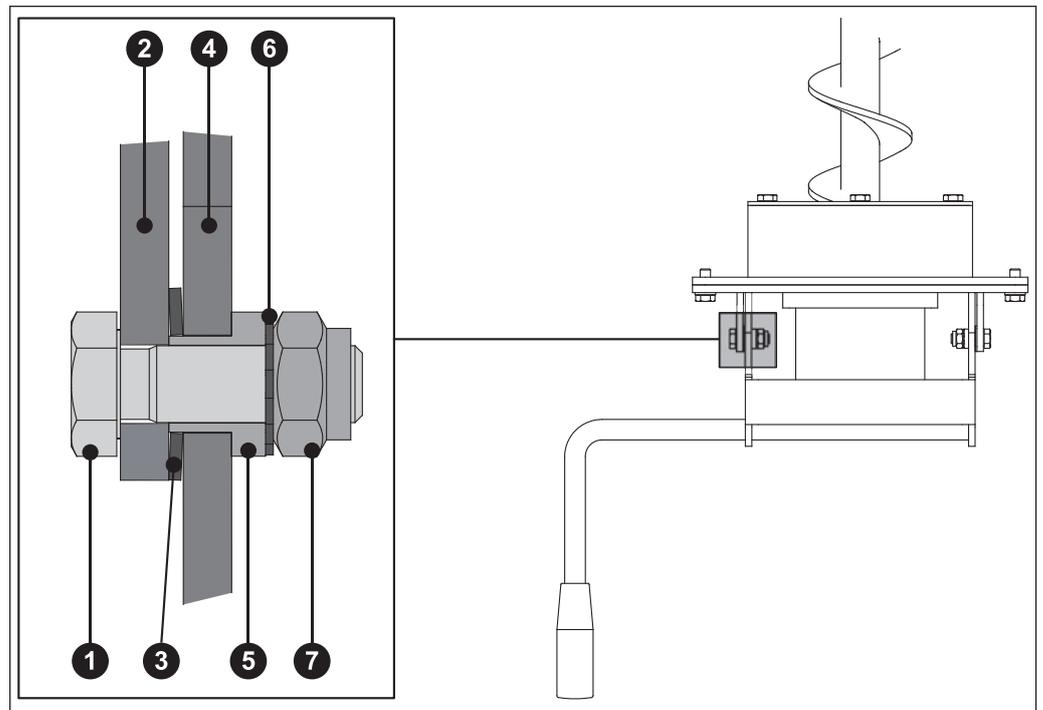


- Put the roller chain over both chain wheels, tighten the chain and connect it at the connecting link
- Secure the connecting link with a clip connector

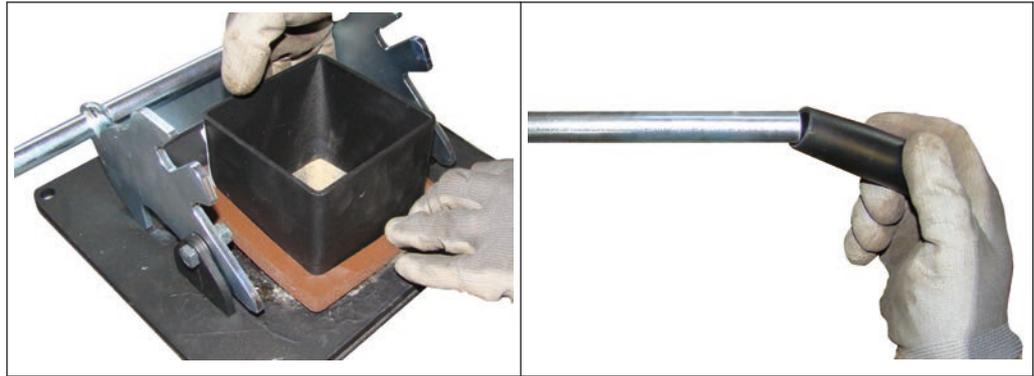


- Finally put on the cover hood and fix it with 4 hexagonal bolts M8x16 at the pedestal
- Mount counterpart with captive screws

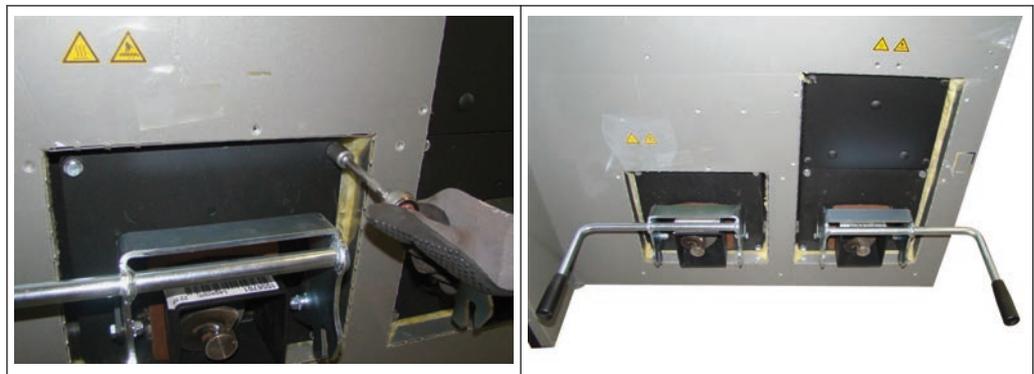
*Installing the ash boxes*



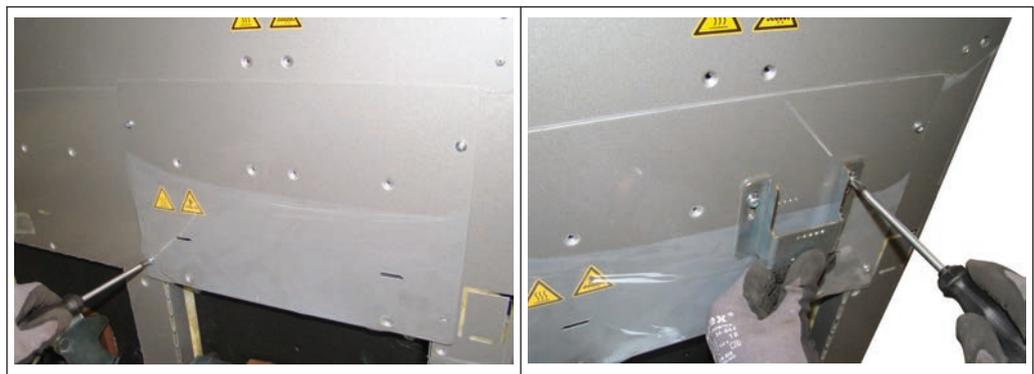
1	Hexagonal bolt M8x25	2	Ash removal flange
3	Plate washer	4	Locking lever
5	Bushing	6	Lock washer M8
7	Lock nut M8		



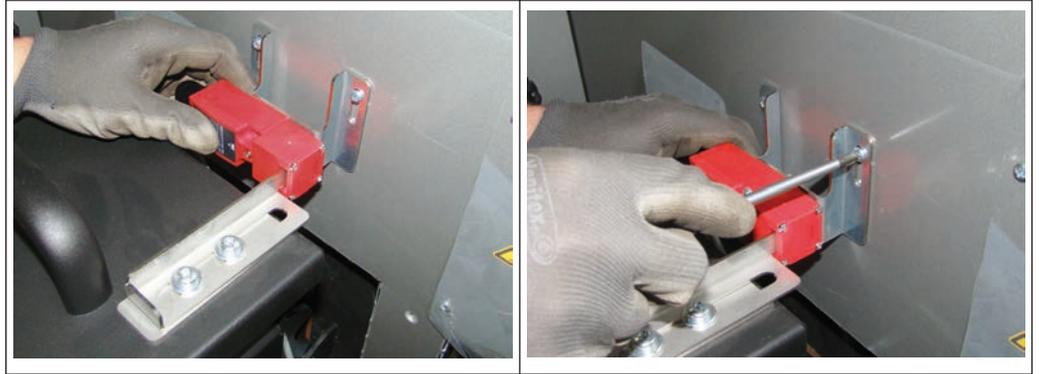
- Mount the locking lever at the ash removal flange as seen in the illustration above
- Put the rubber seal over the channel of the ash removal flange
- Put the plastic handle on the locking lever
  - Use a rubber mallet



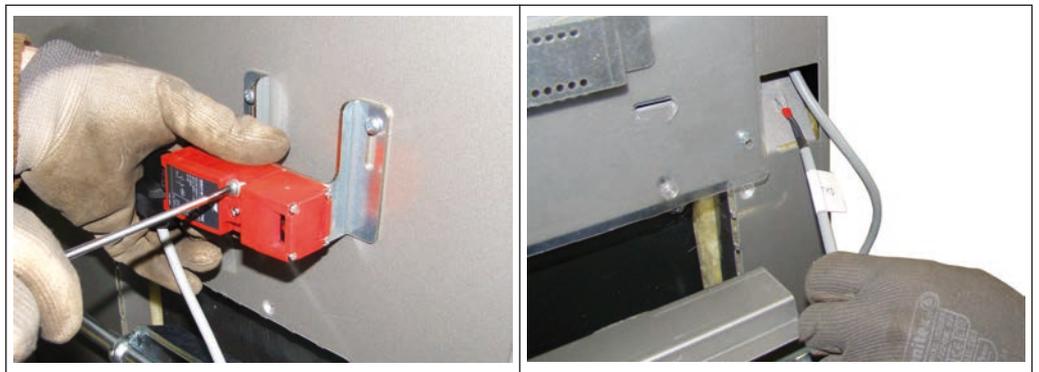
- Fix both ash removal flanges with 4 hexagonal bolts M8x20 and washers M8
  - Place the flanges that way, that the locking levers are positioned outside



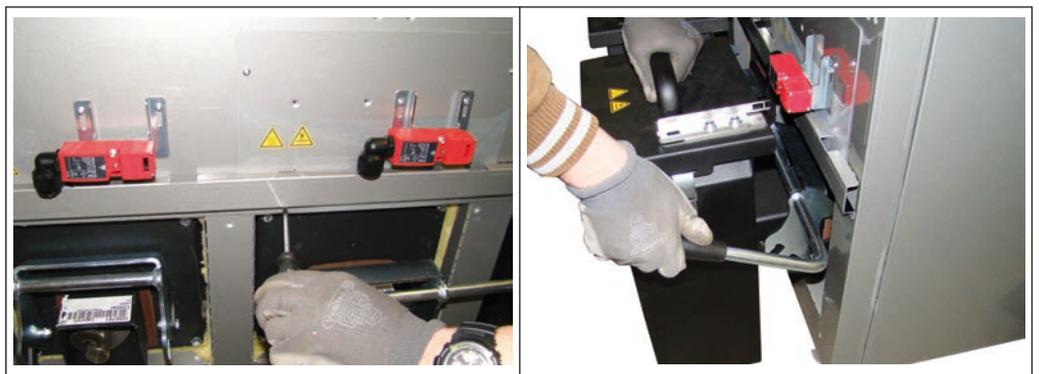
- Mount the cover plate above the exterior ash removal flange
- Mount the retainer for the safety limit switch above the ash removal flange at the insulating side panel respectively at the cover plate with sheet metal screws
  - Place the retainer above the right corner
  - Do not fasten screws yet



- Put the ash box onto the ash removal flange and place the safety limit switch at the retainer
- Slide key plate on the ashbox cover into the safety limit switch
- Fasten screwings at the retainer

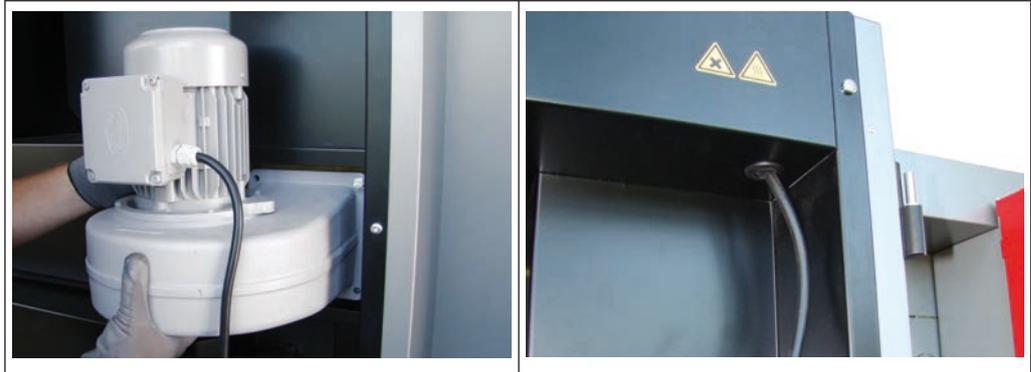


- Fix the safety limit switch with 2 self-tapping screws M4x30 at the retainer
- Turn cable gland of the limit switch by 90° if necessary
- Bend both lugs at the insulating side panel and lay the cable of the safety limit switch upwards to the switch cabinet



- Put the ash boxes on and fix them with the locking levers
- Put the cable channel below the safety limit switch on and fix it with sheet metal screws

#### 4.5.23 Installing the combustion air blower fan

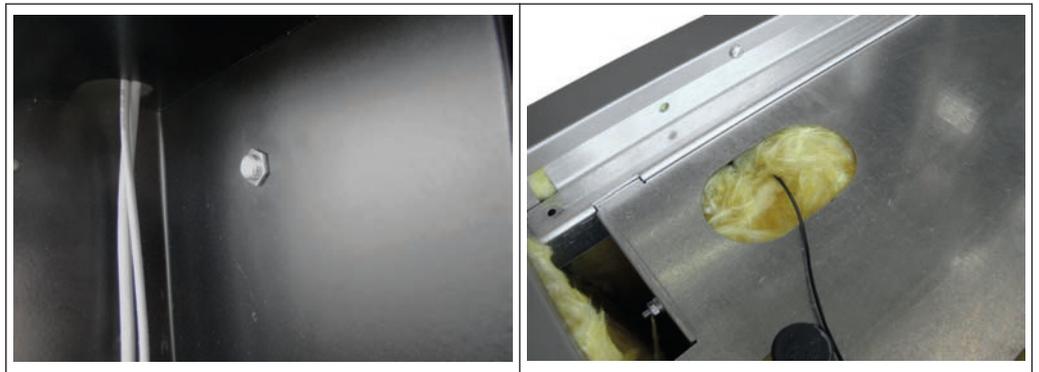


- Mount the combustion air blower fan with ceramic fibre seal above the combustion chamber door with 4 hexagonal bolts M6x16 and washers M6
  - The louver has to point downwards
- Run the connection cable upwards and lay it to the switch cabinet through the opening in the frame element

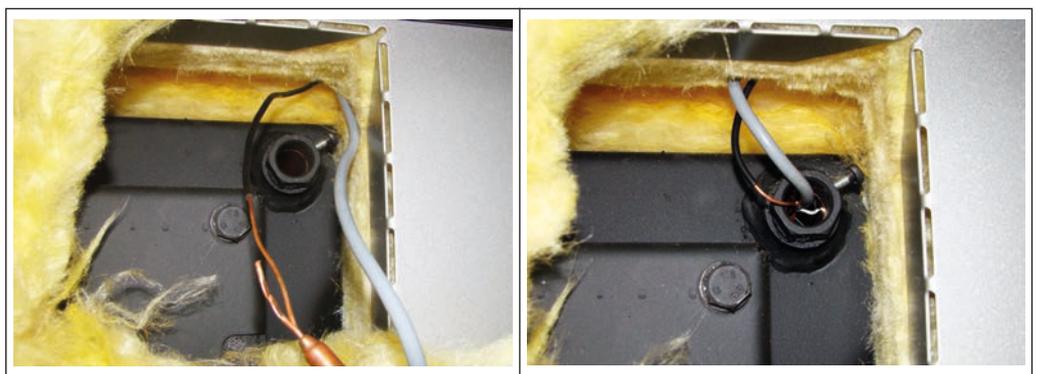
#### 4.5.24 Installing the STL and the boiler sensor



- Unscrew the washer at the Safety Temperature Limiter (STL)
- Push the STL from the behind through the frame element

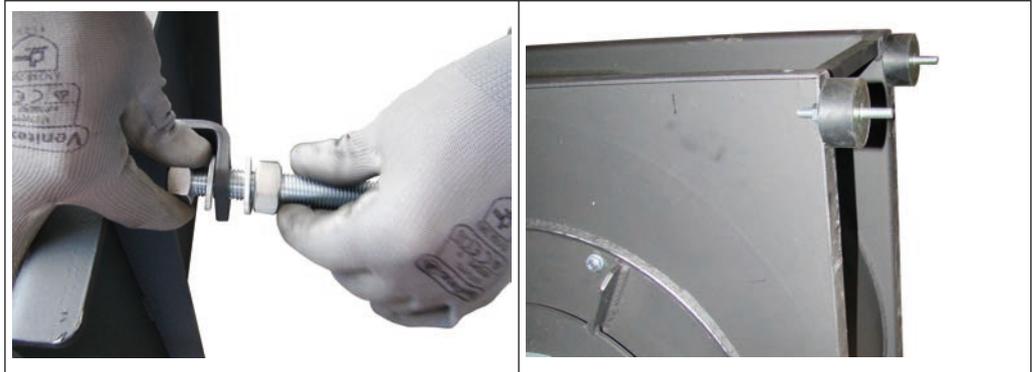


- Fix the STL at the frame element with a locating screw
- Put the capillary sensor through the opening at the cable tray and lay it to the thermowell at the heat exchanger

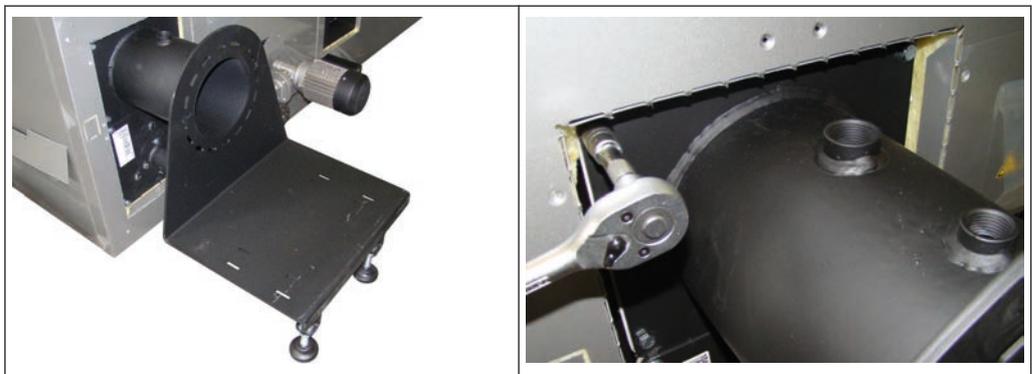


- Put the capillary sensor and the boiler sensor behind the insulating side panel through and insert it with a clamp spring at the thermowell

## 4.5.25 Installing the ID fan



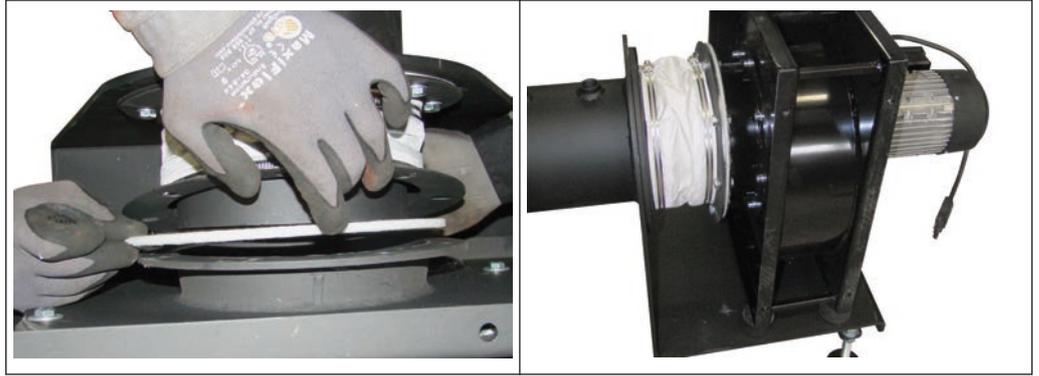
- Mount the supports on the left and the right of the ID console
- Put 4 rubber buffers onto the intended slotted holes at the ID fan



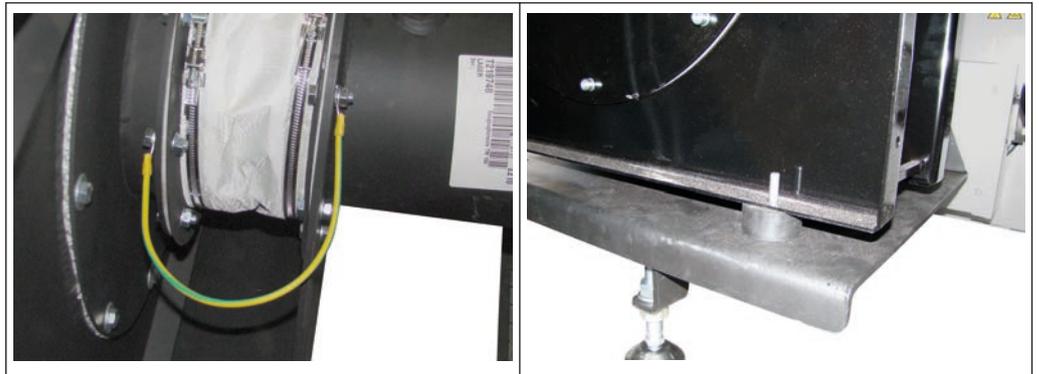
- Place the ID console incl. seal at the flange and fix it with each 4 hexagonal bolts M8x20 and washers M8



- Level the ID console via supports
- Put the ID fan on the ID console as illustrated

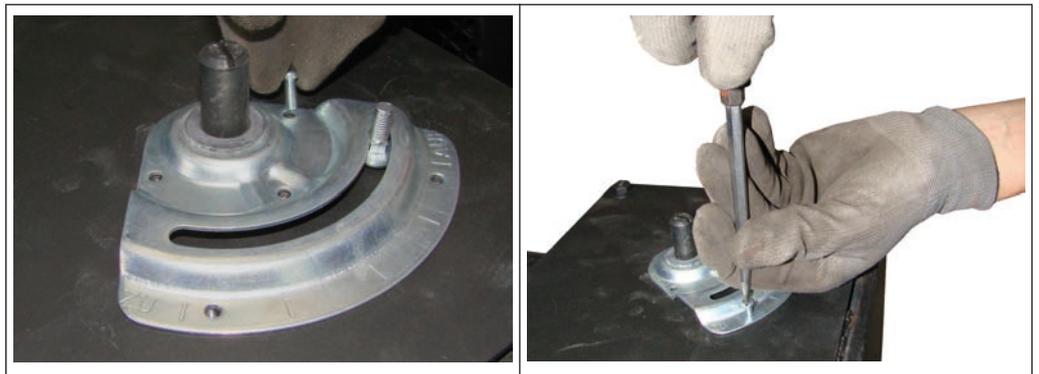


- Mount the flue gas pipe compensator with ceramic fibre seals between ID fan and flange of the ID console



- Screw the included earth wire as potential equalization as illustrated on the left and the right of the flange
- Screw the rubber buffers to the ID console

#### 4.5.26 Installing the FGR air box (optional)



- Insert pan cap screw from the back side of the base plate
- Put the base plate over the shaft of the FGR flap and fix it with 5 cylinder screws to the FGR air box



- Set the FGR flap with a nipper to the right-hand stop
- Put on the lever of the air flap regulator at the shaft and the shouldered bolt and set it to the right end of the scale
- Fix the lever with the included fastening material and wing nut



- Mount the included star knob at the lever
- Mount the FGR air box to the left of the stoker unit at the retort with each 4 hexagonal bolts M8x20 and washers M8

#### 4.5.27 Installing the flue gas recirculation FGR (optional)



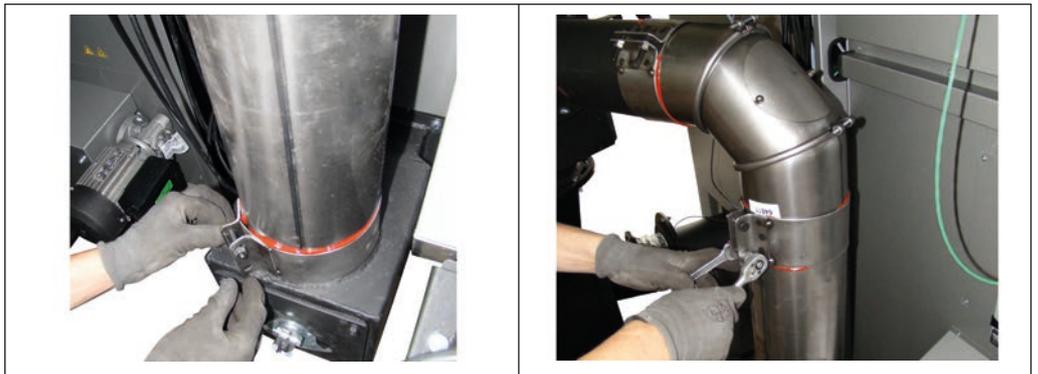
- Mount the tube with flange at the flue gas collecting box
- Place the flue gas collecting box at the ID fan that way, that the tube points to the FRG air box at the retort



- Fix the flue gas collecting box at the ID fan
- Place the flue gas pipe elbow at the tube and measure the distance between flue gas pipe elbow and FGR air box



- Cut the tube to the appropriate length
- Apply refractory silicon to the flue gas pipe clamps



- Assemble the entire FGR piping and fix the flue gas pipe clamps

## 4.5.28 Installing insulating door and cover plates



- Mount the insulating doors to the door hinges at the frame element



- Put on the cable duct cover and fix it with self-tapping screws

## 4.6 Electrical connection



### DANGER

When working on electrical components:

*Risk of electrocution!*

When work is carried out on electrical components:

- Only 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

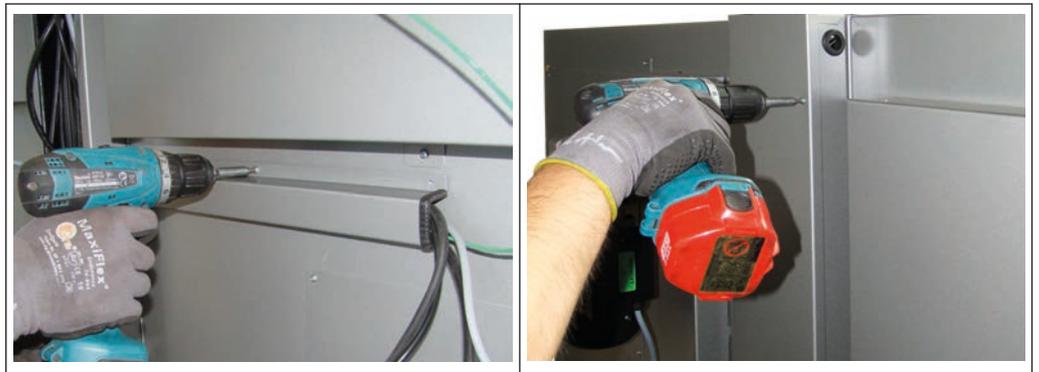
- Lay cables of all components to the switch cabinet
- Connect cables in the switch cabinet according to the wiring diagram
  - For connection see corresponding documentation for firewood boiler
- Secure cables to the strain relief bar with cable ties

#### *Notes on laying cables*

- The cables of the individual units may have excess length. These cables should be coiled in the cable duct.
- Spread the coils of excess cable over the entire cable ducts to prevent the cable ducts from being overfilled!
- Bind the freely hanging cable to the drive motors using cable ties. The cables must not come into contact with the stoker duct!

### 4.6.1 Installing insulating covers and cover plates

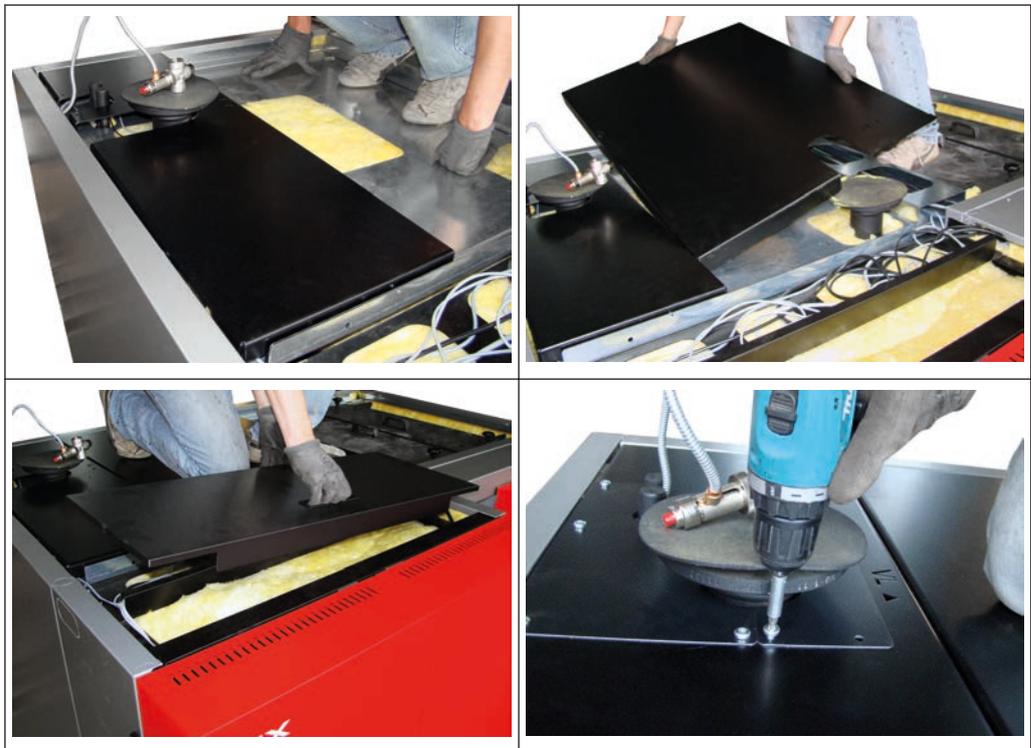
After wiring the components all cover plates and insulating covers must be installed:



- Mount cable ducts at the designated positions on the insulating side panels
- Mount cover plate of vertical cable duct on the back side of the boiler



- Mount cover plate on cable duct of switch cabinet
  - Illustration shows the switch cabinet of TX 200/250. In case of installing a TX 150 the cable duct is mounted below the switch cabinet

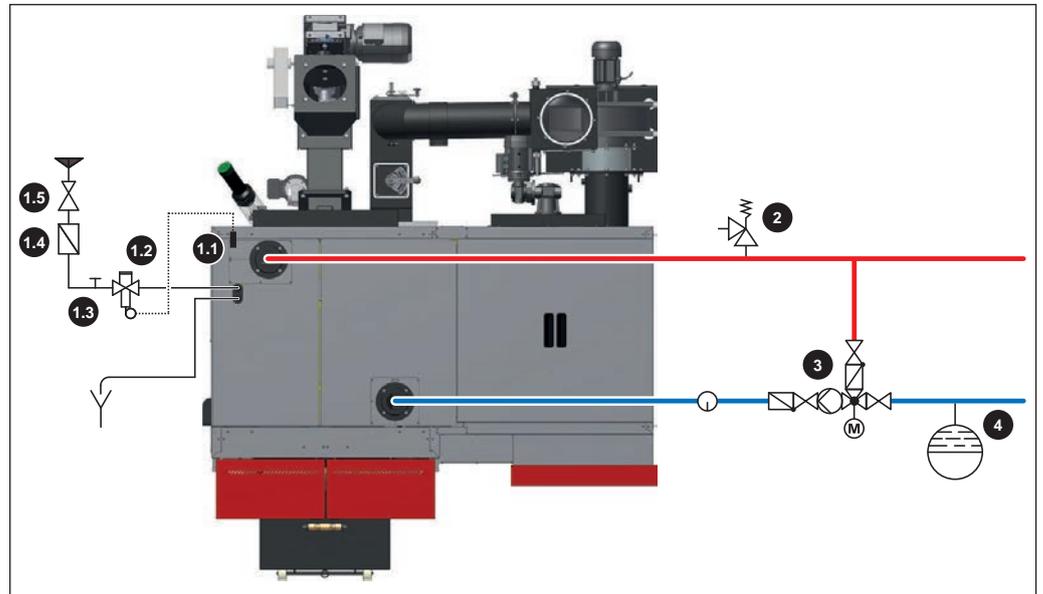


- Put on insulating covers on the boiler as seen at the pictures above
- Lay thermal discharge unit through the opening in the insulating cover and mount cover plates



- Apply heat insulation mat on the heat exchanger cover and put on the insulating cover

## Connecting the hydraulic safety devices



### 1 Thermal discharge valve

- The thermal discharge safety device must be connected in accordance with ÖNORM/DIN EN 303-5 and as shown in the diagram above
- The discharge safety sensor must be connected to a pressurised cold water mains supply (temperature  $\leq 15^{\circ}\text{C}$ ) in such a way that it cannot be shut off
- A pressure reducing valve (1.5) is required for a cold water pressure of  $\geq 6$  bar  
Minimum cold water pressure = 2 bar

- 1.1 Sensor of thermal discharge safety device
- 1.2 Thermal discharge valve (opens at approx.  $95^{\circ}\text{C}$ )
- 1.3 Cleaning valve (T-piece)
- 1.4 Dirt trap
- 1.5 Pressure reducing valve
- 1.6 Free outlet without counter pressure

### 2 Safety valve

- Safety valve as per ÖNORM EN ISO 4126-1, diameter as per EN 12828 or national regulations
- The safety valve must be installed in an accessible place on the heat generator or in direct proximity in the flow pipe in such a way that it cannot be shut off

**3 Return temperature control****4 Diaphragm expansion tank**

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

## 5 Start-up

### 5.1 Before commissioning / configuring the boiler

The boiler must be configured to the heating system on 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 vented.
- Check that all water connections are tightly sealed
  - Pay particular attention to those connections from which plugs were removed during assembly.
- Check that the safety devices are present and working efficiently.
- Check that there is sufficient ventilation in the boiler room.
- Check the seal of the boiler.
  - All doors and inspection openings must be tightly sealed.
- Check that the drives and servo motors are working and turning in the right direction.
- Check that the door contact switch is working efficiently.

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

## 5.2 Initial startup

### 5.2.1 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.

#### *Wood chips*

Criterion	Designation as per		Description acc. to ÖNORM M 7133
	ÖNORM M 7133	EN ISO 17225	
Water content	W20	M20	air-dried
	W30	M30	suitable for storage
	W35	M35	limited suitability for storage
Size	G30	P16S	Fine wood chip
	G50	P31S	Medium-sized wood chip

#### *Note on standards*

EU:	Fuel acc. to EN ISO 17225 - Part 4: Wood chips class A1 / P16S-P31S
Additional for Germany:	Fuel class 4 (§3 of the First Federal Emissions Protection Ordinance (BimSchV) - applicable version)

### 5.2.2 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

### 5.2.3 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 operating instructions for all the steps necessary to start up for the first time Lambdatronic H 3200 TX

## 6 Decommissioning

### 6.1 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

### 6.2 Disassembly

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

### 6.3 Disposal

- Ensure that they are disposed of in an environmentally friendly way in accordance with waste management regulations in the country (e.g. AWG in Austria)
- You can separate and clean recyclable materials and send them to a recycling centre.
- The combustion chamber must be disposed of as builders' waste.

## 7 Appendix

### 7.1 Addresses

#### 7.1.1 Address of manufacturer

**FRÖLING**  
Heizkessel- und Behälterbau GesmbH

Industriestraße 12  
A-4710 Grieskirchen  
AUSTRIA

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

#### 7.1.2 Address of the installer

Stamp